New Phytologist Supporting Information Figs S1–S6, Tables S1–S7

Article title: Changes in soil fungal community composition depend on functional group and forest disturbance type

Article acceptance date: 4 June 2020

Authors: Jean C. Rodriguez-Ramos, Jonathan A. Cale, James F. Cahill Jr., Suzanne W. Simard, Justine Karst*, Nadir Erbilgin*
*These authors share the last authorship

The following Supporting Information is available for this article:

Fig. S1 Map of the sampled disturbed sites in west-central Alberta, Canada.

Table S1 Data from Alberta Vegetation Inventory used to select matched control sites for each disturbed site.

Fig. S2 Sampling design of experimental sites.

Table S2 Forest site characteristics in control and disturbed sites.

Table S3 Depth of the soil organic layer, ergosterol concentration, nutrient concentration, and pH in control and disturbed forests.

Table S4a & b Summary of the fitted linear mixed-effects model and pot-hoc test on the soil fungal biomass in control and disturbed forests

Fig. S3 Non-metric multidimensional scaling plots of the effect of forest disturbances on AM, saprophytic, and all fungal guilds community composition.

Table S5a & b Results from perMANOVA tests and post-hoc comparisons on the community composition of fungal guilds.

Fig. S4 Relative sequence proportion of guilds characterized using ITS1 rDNA.

Fig. S5 Response of soil fungal biomass to the frequency of fungal guilds.

Table S6 Results from statistical tests on the proportion or frequency of guilds and effective number of species data

Fig. S6 Relationship between proportion of ectomycorrhizal fungi and the depth of the soil organic layer in control and disturbed sites.

Table S7 Frequency of genera in disturbances and their paired control sites used for Fig. 6.

Supplementary material

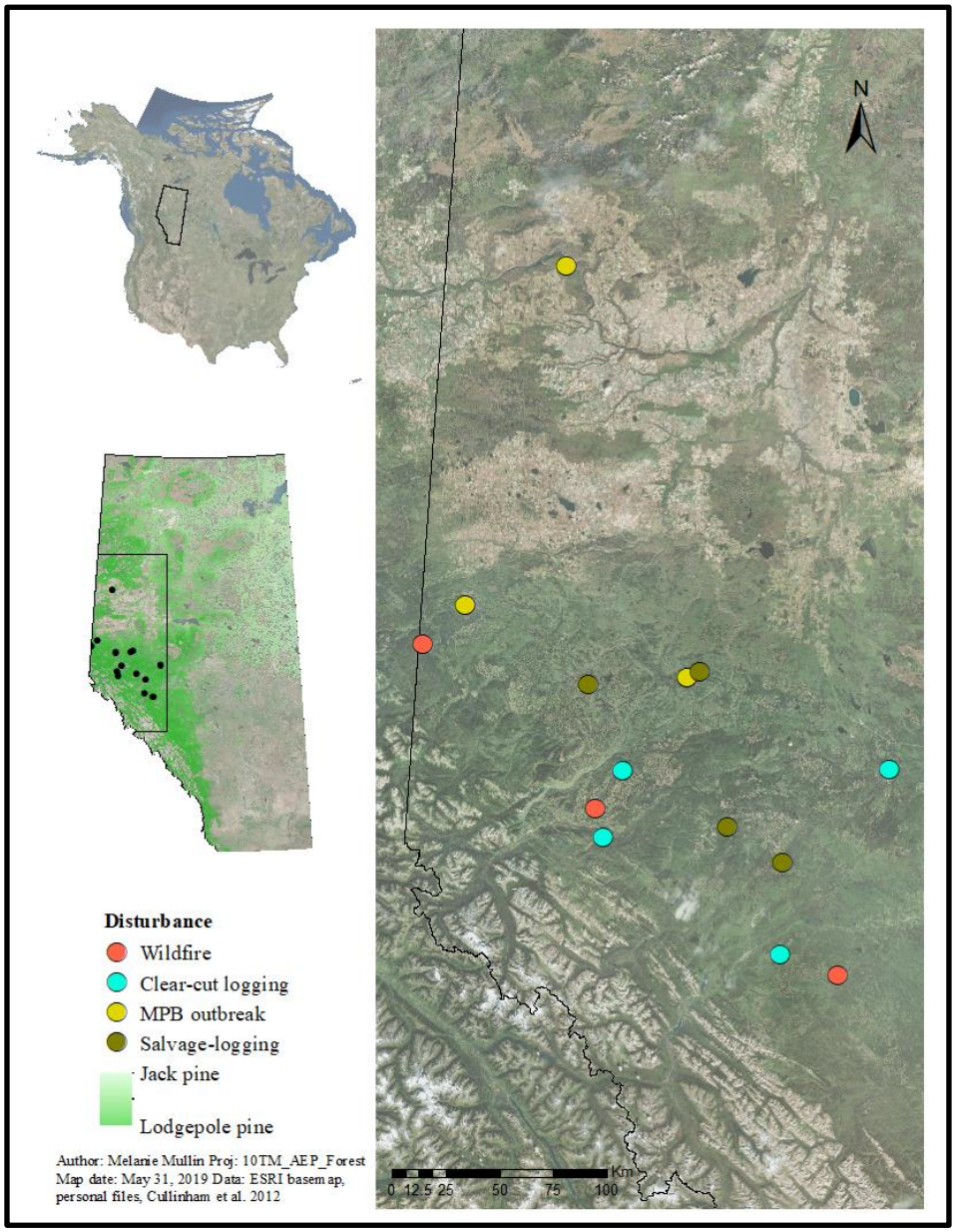


Fig S1 Map of the sampled disturbed sites in west-central Alberta, Canada. For each disturbed site, a control site located within 10 km was also sampled. Wildfire (n = 3, red), clear-cut logging (n = 4, light blue), MPB outbreak (n = 3, yellow), salvage-logging (n = 4, green). MPB: Mountain pine beetle (*Dendroctonus ponderosae*). **Cullingham CI, James PMA, Cooke JEK, Coltman DW**. **2012**. Characterizing the physical and genetic structure of the lodgepole pine × jack pine hybrid zone: Mosaic structure and differential introgression. *Evolutionary Applications* **5**: 879–891.

Table S1 Data from Alberta Vegetation Inventory used to select matched control sites for each disturbed site. The data below represent the state of control sites followed by their disturbed pair. Composition indicates the canopy composition (%) of lodgepole pine (*Pinus contorta*) as well as the composition (%) of other species (black spruce (*Picea mariana*), white spruce (*Picea glauca*), and trembling aspen (*Populus tremuloides*)). Clear-cut logging (CCL); Salvage-logging (SL); MPB: Mountain pine beetle (*Dendroctonus ponderosae*) outbreak.

Site	Disturbance	Year of disturbance	Canopy closure (%)	Height (m)	Lodgepole pine composition (%)	Composition (%) of other species	Composition (%) of other species
G16-5c	Control		6-30	17	100		
G16-5	MPB	2010	6-30	19	100		
G16-6c	Control		31-50	16	90	10- *P. mariana*	
G16-6	Wildfire	2014	51-70	14	90	10- *P. mariana*	
G16-1c	Control		51-70	22	80	10- *P. glauca*	10- *P. tremuloides*
G16-1	SL	2013	51-70	25	70	20- *P. glauca*	10- *P. tremuloides*
G15-8c	Control		71-100	19	70	30- *P. tremuloides*	
G15-8	MPB	2010	51-70	21	70	30- *P. tremuloides*	
G15-1c	Control		51-70	16	100		
G15-1	MPB	2010	31-50	21	100		
G15-2c	Control		51-70	21	90	10- *P. tremuloides*	
G15-2	SL	2011	51-70	21	80	20- *P. tremuloides*	
W14-1c	Control		51-70	26	100		
W14-1	CCL	2011	51-70	26	100		
G15-6c	Control		71-100	22	100		
G15-6	CCL	2011	71-100	22	100		
E8-7c	Control		6-30	16	70	20- *P. mariana*	10- *P. glauca*
E8-7	Wildfire	2014	6-30	16	70	20- *P. mariana*	10- *P. glauca*
E8-3c	Control		51-70	17	100		
E8-3	CCL	2013	51-70	15	100		
E14-4c	Control		51-70	23	100		
E14-4	SL	2010	51-70	23	100		

E14-2c	Control		51-70	20	100	
E14-2	SL	2015	51-70	22	100	
E14-6c	Control		51-70	22	100	
E14-6	CCL	2010	51-70	21	100	
E14-8c	Control		51-70	21	90	10- *P. tremuloides*
E14-8	Wildfire	2009	51-70	22	90	10- *P. tremuloides*

7

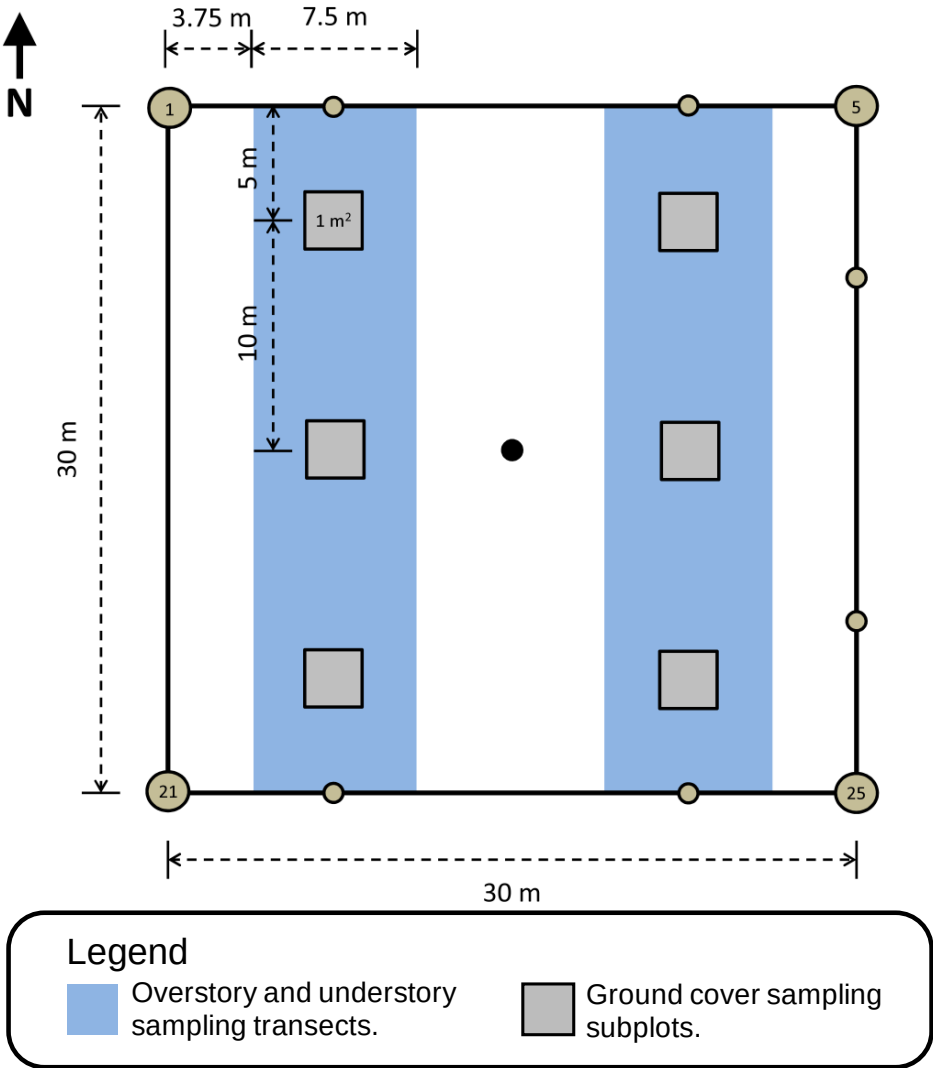


Figure S2 Sampling design of experimental sites consisted of a 900 m^2 plot with a 25-point grid sampling.

Table S2 Forest site characteristics in control and disturbed sites. Data represents mean ± SE for each treatment. MPB: Mountain pine beetle (*Dendroctonus ponderosae*).

	Control	MPB outbreak	Clear-cut logging	Salvage-logging	Wildfire
Forest overstory					
Live lodgepole pine basal area (m^2 ha^{-1})	285.4 ± 24.28	146.8 ± 65.41	0.1 ± 0.06	0.3 ± 0.22	8.7 ± 8.75
Forest understory					
Non-conifer individuals	18.7 ± 6.55	0.0 ± 0.00	13.3 ± 8.10	10.5 ± 6.70	0.3 ± 0.33
Conifer individuals	3.0 ± 2.35	1.0 ± 1.00	0.8 ± 0.48	1.3 ± 1.25	0.0 ± 0.00
Ground cover (%)					
Shrubs	11.4 ± 2.23	22.3 ± 8.91	18.6 ± 4.23	13.4 ± 7.27	9.6 ± 8.58
Grass	1.4 ± 0.62	50.7 ± 26.82	20.8 ± 8.06	21.2 ± 9.87	0.1 ± 0.05
Forbs	19.2 ± 4.86	11.9 ± 5.75	10.8 ± 6.44	21.7 ± 7.27	22.6 ± 10.51
Moss	46.1 ± 8.01	38.7 ± 19.28	5.0 ± 1.95	0.5 ± 0.23	16.8 ± 5.27
Woody debris	11.7 ± 2.01	8.5 ± 3.88	17.8 ± 5.25	13.8 ± 5.00	20.8 ± 10.34
Leaf litter	22.5 ± 5.44	4.1 ± 1.63	11.5 ± 4.14	17.3 ± 11.63	4.4 ± 4.44
Exposed soil	0.0 ± 0.01	0.1 ± 0.06	13.3 ± 3.76	2.7 ± 1.75	35.0 ± 18.28

Table S3 Depth of the soil organic layer, ergosterol concentration, and nutrient concentration in control and disturbed forests. Data represents mean ± SE for each site. Clear-cut logging (CCL); Salvage-logging (SL); Mountain pine beetle (*Dendroctonus ponderosae*) outbreak (MPB); Very strongly acidic (VSA); Strongly acidic (StA), Extremely acidic (EA), Slightly acidic (SlA).

Site ID	Disturbance	Depth (cm)	Ergosterol concentration (μg g^{-1})	PO_4 (mg kg^{-1})	NH_4 (mg kg^{-1})	NO_3 (mg kg^{-1})	K (mg kg^{-1})	pH
E14-2C	Control	4.3 ± 1.19	2.4 ±0.25	20.12	5.76	0.96	116.80	4.7 (VSA)
E14-4C	Control	4.3 ± 0.20	5.4 ± 0.86	21.44	2.88	0.67	131.54	4.92 (VSA)
E14-6C	Control	5.4 ± 0.34	7.4± 3.14	14.36	7.87	0.76	77.16	5.39 (StA)
E14-8C	Control	3.2 ± 0.17	2.2 ± 0.31	18.87	7.88	0.69	110.29	5.07 (StA)
E8-3C	Control	4.7 ± 0.18	3.4 ± 0.32	20.01	2.48	0.61	81.54	4.64 (VSA)
E8-7C	Control	4.4 ± 0.19	3.2 ± 0.96	17.92	2.22	0.66	72.64	4.23 (EA)
G15-1C	Control	8.3 ± 0.39	9.7 ± 1.84	25.84	4.04	1.18	176.47	4.2 (EA)
G15-2C	Control	6.7 ± 0.37	8.6 ± 4.61	10.44	4.57	1.67	121.30	4.78 (VSA)
G15-6C	Control	4.4 ± 0.23	5.8 ± 2.96	23.55	5.57	0.84	81.47	4.55 (VSA)
G15-8C	Control	8.0 ± 0.40	10.7 ± 2.47	18.16	10.1	1.94	481.67	5.59 (SlA)
G16-1C	Control	4.0 ± 0.24	8.3 ± 1.66	8.17	2.36	0.74	72.04	4.6 (VSA)
G16-5C	Control	3.5 ± 0.18	4.1 ± 1.06	19.79	2.34	0.86	31.15	5.19 (StA)
G16-6C	Control	4.3 ± 0.35	5.3 ± 1.07	9.29	13.96	8.62	102.18	5.33 (StA)
W14-1C	Control	3.7 ± 0.22	2.7 ± 1.14	7.51	3.33	1.34	77.29	4.96 (VSA)
E14-8	Wildfire	2.2 ± 0.17	2.0 ± 0.25	17.72	5.5	1.97	125.42	5.24 (StA)
E8-7	Wildfire	3.0 ± 0.32	1.2 ± 0.20	33.76	6.07	0.81	61.08	4.61 (VSA)
G16-6	Wildfire	3.1 ± 0.27	1.0 ± 0.20	22.89	8.72	1.03	87.40	4.84 (VSA)
E14-6	CCL	3.4 ± 0.25	4.8 ± 1.15	12.35	13.65	13.51	143.38	5.33 (StA)
E8-3	CCL	2.7 ± 0.19	2.3 ± 0.38	18.8	2.25	0.69	70.71	4.74 (VSA)
G15-6	CCL	0.7 ± 0.20	0.7 ± 0.20	26	4.42	0.72	84.36	4.6 (VSA)
W14-1	CCL	1.2 ± 0.20	3.4 ± 1.42	29.37	2.15	2.05	128.96	5.34 (StA)

G15-1	MPB	7.5 ± 0.79	11.7 ± 3.29	57.03	1.94	1.45	42.47	4.07 (EA)
G15-8	MPB	5.8 ± 0.36	9.5 ± 1.82	9	6.61	1.70	329.20	5.73 (SlA)
G16-5	MPB	4.1 ± 0.19	3.6 ± 0.54	33.33	2.77	0.78	50.16	4.77 (VSA)
E14-2	SL	3.3 ± 0.38	1.5 ± 0.41	6.76	7.43	3.47	97.59	4.82 (VSA)
E14-4	SL	2.6 ± 0.27	3.1 ± 0.77	14.65	4.85	0.81	97.06	4.75 (VSA)
G15-2	SL	5.7 ± 0.49	3.5 ± 0.73	7.79	3.03	1.42	109.44	4.71 (VSA)
G16-1	SL	3.1 ± 0.39	4.6 ± 0.71	7.69	7.92	0.93	214.57	4.99 (VSA)

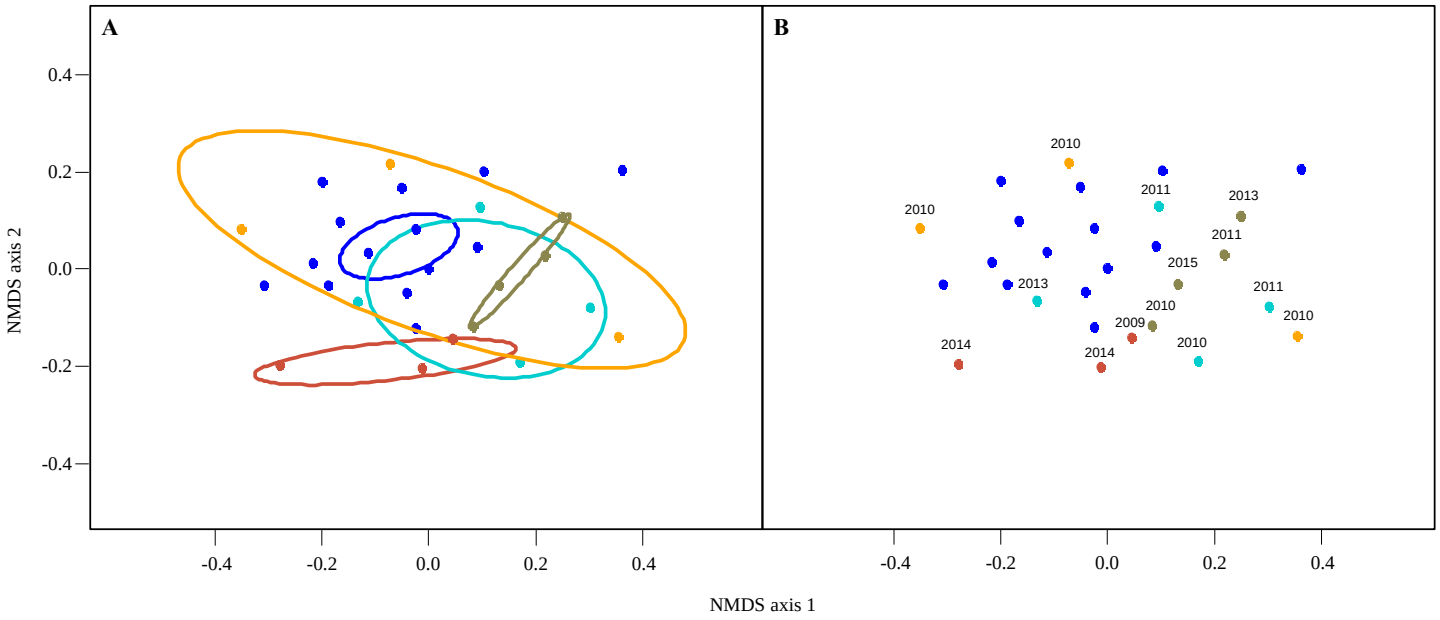
28

Table S4a Summary of the fitted linear mixed effects model on the soil fungal biomass in control and disturbed forests. MPB: Mountain pine beetle, σ^2: level-one variance, $\tau_{00\ ID}$: level-two variance, ICC: intraclass Correlation Coefficient, and N_{ID}: number of groups.

	Ergosterol concentration	
Predictors	*Estimates*	*P-value*
(Intercept)	0.67	<0.001
Wildfire	-0.56	<0.001
Clear-cut logging	-0.36	0.005
MPB outbreak	0.17	0.241
Salvage-logging	-0.23	0.076
Random effects		
σ^2	0.06	
$\tau_{00\ ID}$	0.04	
ICC	0.40	
N_{ID}	28	
Observations	112	
Marginal R^2 / Conditional R^2	0.338 / 0.605	

TableS4b Results from post-hoc test with Tukey's adjustments for multiple comparisons on differences in soil fungal biomass in control and disturbed forests, following linear mixed effects model test. Values represent *P*-values. Bold text represents results deemed significant. Mountain pine beetle (MPB).

Disturbances	Control	Wildfire	Clear-cut logging	MPB outbreak
Wildfire	**0.001**	-	-	-
Clear-cut logging	**0.038**	0.72	-	-
MPB outbreak	0.723	**0.001**	**0.019**	-
Salvage -logging	0.309	0.309	0.724	0.131



40 **Fig. S3** Non-metric multidimensional scaling plots of the effect of forest disturbances whole
41 community composition (all fungal guilds) with and without year of disturbance (A, B,
42 respectively). Dots represent individual sites and ellipses 95% confidence intervals.
43 MPB: mountain pine beetle (*Dendroctonus ponderosae*).
44
45

Table S5a Results from perMANOVA tests on the community composition of fungal guilds with disturbance as predictor variable. Degrees of freedom (*df*), sum of squares (*Sum Sq*), mean squares (*MeanSq*). Bold text represents results deemed significant.

Statistical values	*df*	*Sum Sq*	*MeanSq*	*F-value*	R^2	*P-value*
Whole community (all guilds)						
Disturbance	4	0.902	0.22549	1.431	0.19925	**0.01**
Residuals	23	3.625	0.15760		0.80075	
Total	27	4.527			1.00	
Ectomycorrhizal fungi						
Disturbance	4	1.873	0.468	2.291	0.251	< **0.001**
pH	3	1.336	0.445	2.179	0.179	< **0.001**
Dist:pH	34	0.997	0.249	1.220	0.133	
Residual	16	3.269	0.204		0.437	
Total	27	7.474			1.000	
Saprophytic fungi						
Disturbance	4	1.011	0.253	1.288	0.183	0.08
Residual	23	4.513	0.196		0.817	
Total	27	5.524			1.000	
Pathogenic fungi						
Disturbance	4	1.647	0.412	1.354	0.19159	**0.04**
Residual	23	6.995	0.304		0.809	
Total	27	8.642			1.000	
Arbuscular mycorrhizal fungi						
Disturbance	4	0.211	0.053	1.178	0.170	0.32
Residual	23	1.029	0.045		0.830	
Total	27	1.240			1.000	

Table S5b Results from post-hoc test with Holm adjustments for multiple comparisons on community composition of guilds, following perMANOVA tests. Values represent *P-values*. Bold text represents results deemed significant. Mountain pine beetle (MPB)

Disturbance	Control	Wildfire	Clear-cut logging	MPB outbreak
		Whole community		
Wildfire	**0.03**	-	-	-
Clear-cut logging	0.22	1.00	-	-
MPB outbreak	1.00	1.00	1.00	-
Salvage -logging	**0.03**	0.40	1.00	1.00
		Ectomycorrhizal fungi		
Wildfire	**0.03**	-	-	-
Clear-cut logging	**0.03**	1.00	-	-
MPB outbreak	1.00	1.00	1.00	-
Salvage -logging	**0.02**	0.20	1.00	1.00
		Saprophytic fungi		
Wildfire	0.66	-	-	-
Clear-cut logging	1.00	1.00	-	-
MPB outbreak	1.00	1.00	1.00	-
Salvage -logging	0.29	0.29	1.00	1.00
		Pathogenic fungi		
Wildfire	**0.05**	-	-	-
Clear-cut logging	1.00	1.00	-	-
MPB outbreak	1.00	0.80	1.00	-
Salvage -logging	0.81	0.32	1.00	1.00
		Arbuscular mycorrhizal fungi		
Wildfire	1.00	-	-	-
Clear-cut logging	0.22	1.00	-	-
MPB outbreak	1.00	1.00	1.00	-
Salvage -logging	1.00	1.00	1.00	1.00

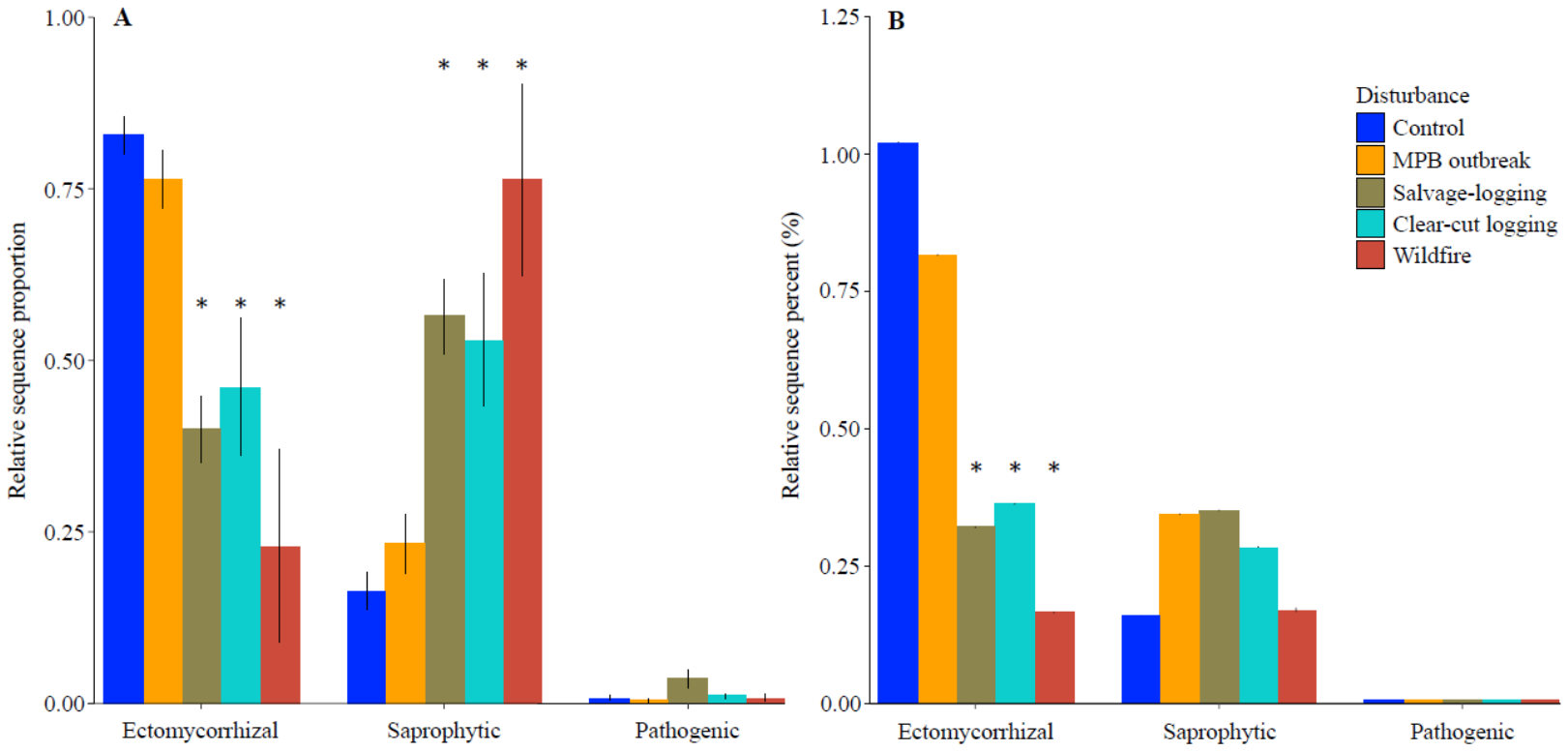
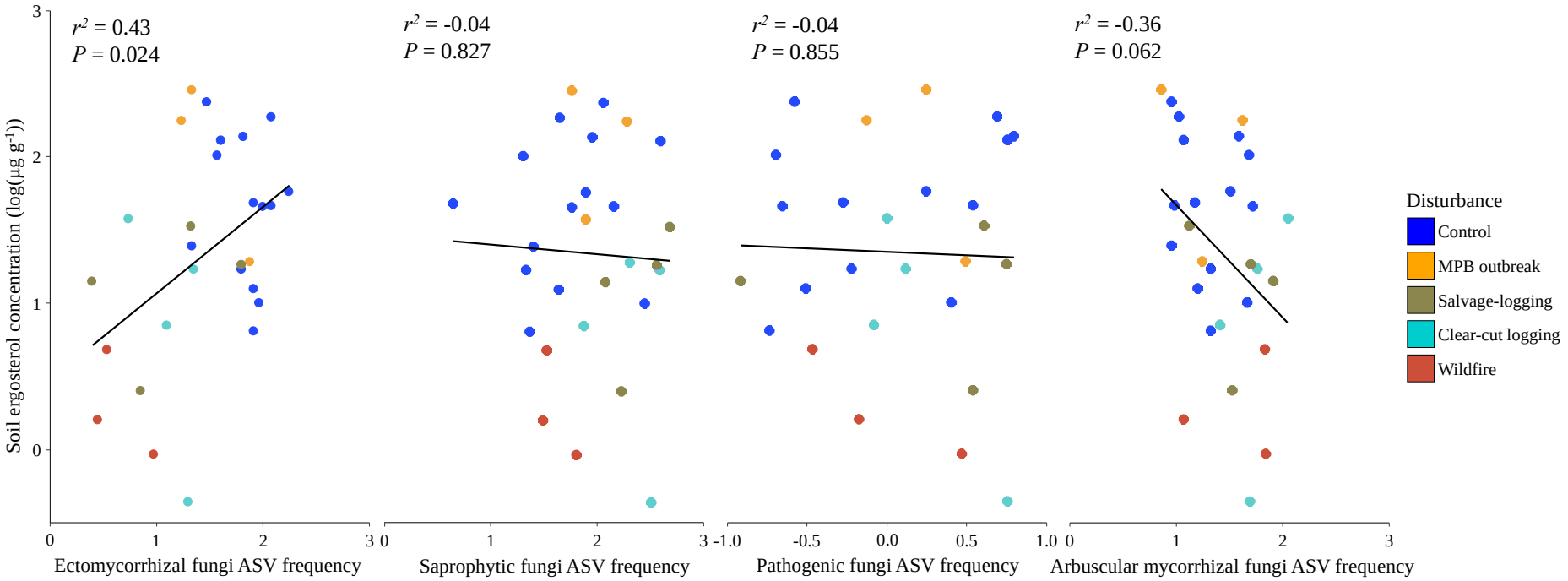


Figure S4 Relative sequence proportion of guilds characterized using ITS1 rDNA (A), and percentage of sequences in guild from the overall ITS1 dataset (B). Data are mean ± SE (n = 14 for control, n = 4 for salvage logging and clear-cut logging, and n = 3 for wildfire and MPB outbreak). Asterisks indicate statistical significance from control at α = 0.1 from Kruskal-Wallis test of ranks followed by Tukey's HSD. In figure A, $\chi^2_4 = 19.75$, $P < 0.001$ in ectomycorrhizal, $\chi^2_4 = 19.93$, $P < 0.001$ for saprophytic, and $\chi^2_4 = 7.90$, $P = 0.095$ for pathogenic fungi. In figure B, $\chi^2_4 = 19.75$, $P < 0.001$ in ectomycorrhizal, $\chi^2_4 = 19.08$, $P < 0.001$ for saprophytic, and $\chi^2_4 = 11.61$, $P = 0.021$ for pathogenic fungi $\chi^2_4 = 6.25$, $P = 0.182$. MPB: mountain pine beetle (*Dendroctonus ponderosae*).



66 **Figure S5** Response of soil fungal biomass to the frequency of ectomycorrhizal, saprophytic, pathogenic, and arbucular mycorrhizal
67 fungal frequency. Results from Pearson's correlation of log-transformed frequencies and ergosterol concentration. ASV:
68 Amplicon sequence variant; MPB: Mountain pine beetle
69
70

Table S6 Results from statistical tests on the proportion or frequency of guilds and effective number of species data, followed by post-hoc test with Tukey's adjustment for multiple comparisons. Proportion and frequency of guilds were tested with Kruskal-Wallis test of ranks and effective number of species for each of the guilds was tested with one-way ANOVA. Values represent *P*-values. Bold text represents results deemed significant. Mountain pine beetle (MPB).

Disturbance	Control	Wildfire	Clear-cut logging	MPB outbreak
Ectomycorrhizal fungi proportion (χ^2_4=18.63, P < 0.001)				
Wildfire	**0.02**	-	-	-
Clear-cut logging	**0.07**	1.00	-	-
MPB outbreak	0.33	0.60	0.60	-
Salvage -logging	**0.01**	1.00	1.00	0.60
Saprophytic fungi proportion (χ^2_4=17.45, P = 0.002)				
Wildfire	0.17	-	-	-
Clear-cut logging	0.01	1.00	-	-
MPB outbreak	0.47	1.00	1.00	-
Salvage -logging	0.02	1.00	1.00	0.69
Pathogenic fungi proportion (χ^2_4=4.78, P = 0.310)				
Wildfire	0.68	-	-	-
Clear-cut logging	1.00	1.00	-	-
MPB outbreak	1.00	1.00	1.00	-
Salvage -logging	1.00	1.00	1.00	1.00
Arbuscular mycorrhizal fungi proportion (χ^2_4=8.02, P = 0.091)				
Wildfire	**0.06**	-	-	-
Clear-cut logging	1.00	1.00	-	-
MPB outbreak	1.00	0.90	1.00	-
Salvage -logging	1.00	1.00	1.00	1.00
Ectomycorrhizal fungi diversity ($F_{4,23}$=6.245, P = 0.001)				
Wildfire	< **0.01**	-	-	-
Clear-cut logging	**0.07**	0.46	-	-
MPB outbreak	0.44	0.23	0.97	-
Salvage -logging	0.23	0.24	0.99	1.00

Saprophytic fungi diversity ($F_{4,23}$=3.584, P = 0.021)				
Wildfire	0.89	-	-	-
Clear-cut logging	0.74	0.48	-	-
MPB outbreak	1.00	0.86	0.97	-
Salvage -logging	**0.02**	**0.03**	0.45	0.22
Pathogenic fungi diversity ($F_{4,23}$= 0.463, P = 0.762)				
Wildfire	0.64	-	-	-
Clear-cut logging	1.00	0.73	-	-
MPB outbreak	0.49	1.00	0.61	-
Salvage -logging	0.65	0.22	0.85	0.16
Arbuscular mycorrhizal fungi diversity ($F_{4,23}$=1.98, P = 0.132)				
Wildfire	0.82	-	-	-
Clear-cut logging	0.53	1.00	-	-
MPB outbreak	0.51	0.26	0.12	-
Salvage -logging	0.91	1.00	0.98	0.31

77

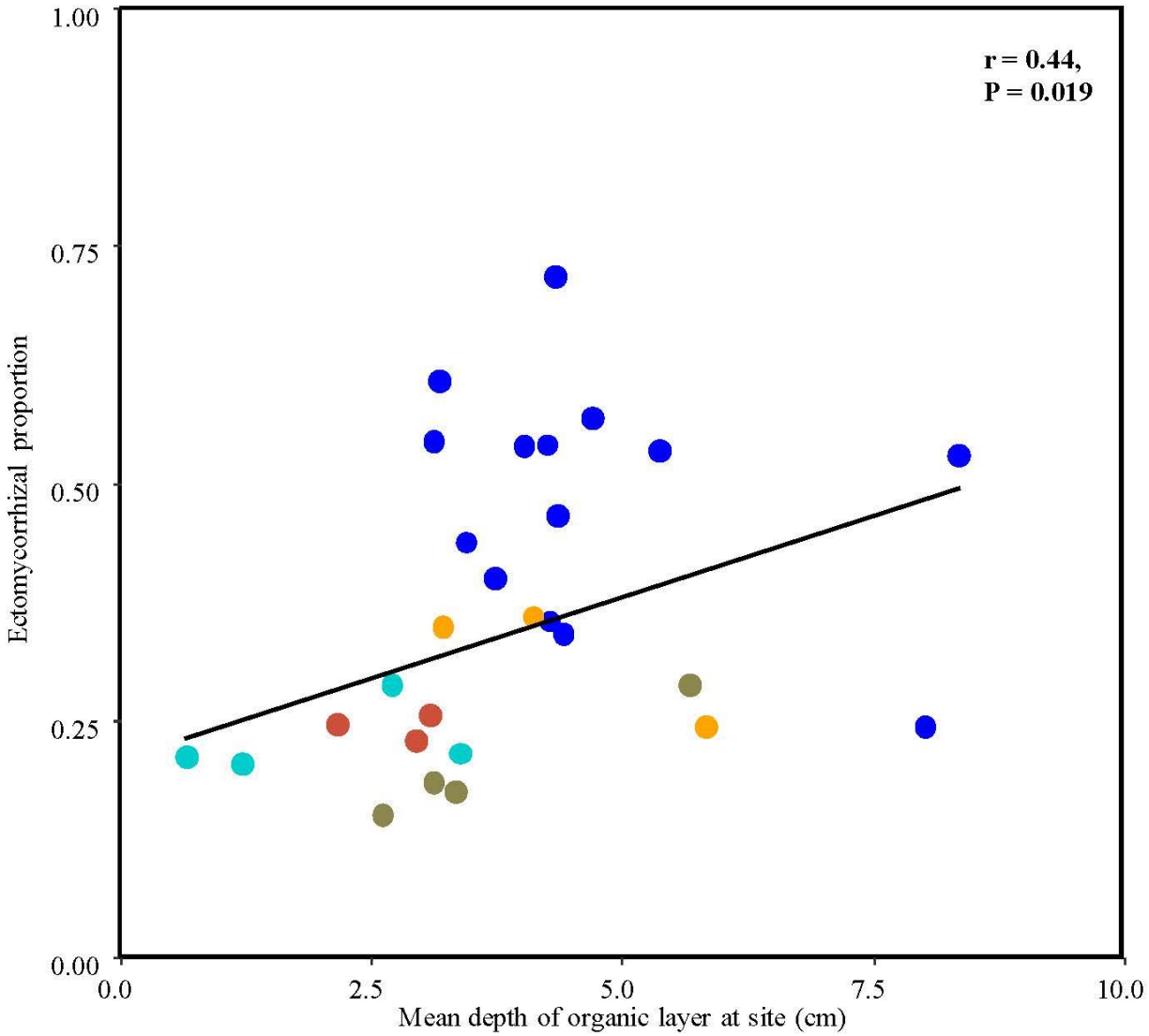


Fig. S6 Relationship between relative proportion of ectomycorrhizal fungi and the depth of the soil organic layer in control and disturbed sites.

Table S7 Frequency of genera in disturbances and their paired control sites used for Fig. 6. Data represent mean ± SE for each disturbance. Clear-cut logging (CCL); Salvage-logging (SL); MPB: Mountain pine beetle (*Dendroctonus ponderosae*) outbreak.

Taxa (genus)	Wildfire	Wildfire-Control	SL	SL-Control	CCL	CCL-Control	MPB	MPB-Control
Hygrophorus	0.1 ± 0.04	0.2 ± 0.09	0.0 ± 0.02	0.1 ± 0.04	0.1 ± 0.01	0.2 ± 0.06	0.1 ± 0.05	0.2 ± 0.12
Russula	0.2 ± 0.18	0.8 ± 0.51	0.8 ± 0.34	1.2 ± 0.33	0.4 ± 0.11	0.9 ± 0.12	1.0 ± 0.37	1.2 ± 0.22
Tomentella	0.2 ± 0.13	0.5 ± 0.43	0.5 ± 0.19	1.2 ± 0.35	0.5 ± 0.11	0.5 ± 0.17	0.7 ± 0.34	0.5 ± 0.09
Lactarius	0.0 ± 0.01	0.2 ± 0.09	0.1 ± 0.03	0.4 ± 0.04	0.0 ± 0.03	0.3 ± 0.21	0.1 ± 0.09	0.3 ± 0.19
Cortinarius	0.1 ± 0.01	0.6 ± 0.08	0.1 ± 0.04	0.5 ± 0.15	0.2 ± 0.07	0.5 ± 0.10	0.4 ± 0.17	0.8 ± 0.32
Piloderma	0.2 ± 0.04	1.7 ± 0.05	0.1 ± 0.04	1.4 ± 0.12	0.4 ± 0.15	1.4 ± 0.16	0.8 ± 0.40	1.2 ± 0.48
Tuber	0.0 ± 0.01	0.0 ± 0.01	0.1 ± 0.05	0.0 ± 0.02	0.1 ± 0.12	0.0 ± 0.01	0.0 ± 0.01	0.0 ± 0.01
Tricholoma	0.0 ± 0.03	0.0 ± 0.01	0.1 ± 0.05	0.1 ± 0.04	0.0 ± 0.01	0.0 ± 0.00	0.3 ± 0.28	0.3 ± 0.10
Cladophialaphora	0.2 ± 0.07	0.2 ± 0.06	0.7 ± 0.10	0.2 ± 0.09	0.7 ± 0.17	0.2 ± 0.08	0.5 ± 0.17	0.9 ± 0.01
Mortierella	1.4 ± 0.27	1.1 ± 0.34	2.7 ± 0.46	1.5 ± 0.49	2.3 ± 0.75	1.7 ± 0.59	2.6 ± 0.70	2.2 ± 1.03
Clavaria	0.4 ± 0.14	0.3 ± 0.13	0.5 ± 0.22	0.2 ± 0.08	0.6 ± 0.12	0.4 ± 0.24	0.2 ± 0.07	0.1 ± 0.02
Xenopolyscytelum	0.1 ± 0.09	0.0 ± 0.00	0.4 ± 0.20	0.1 ± 0.06	0.4 ± 0.23	0.1 ± 0.08	0.3 ± 0.23	0.3 ± 0.23
Fayodia	0.3 ± 0.09	0.0 ± 0.03	0.3 ± 0.06	0.0 ± 0.01	0.1 ± 0.08	0.1 ± 0.02	0.0 ± 0.04	0.1 ± 0.03
Hyphodontiella	0.0 ± 0.00	0.0 ± 0.01	0.1 ± 0.08	0.0 ± 0.02	0.0 ± 0.00	0.0 ± 0.00	0.0 ± 0.00	0.1 ± 0.08
Gymnopus	0.0 ± 0.00	0.0 ± 0.01	0.0 ± 0.01	0.1 ± 0.01	0.0 ± 0.01	0.1 ± 0.03	0.1 ± 0.04	0.1 ± 0.03
Archaeorhizomyces	0.0 ± 0.00	0.0 ± 0.01	0.1 ± 0.06	0.2 ± 0.13	0.0 ± 0.01	0.0 ± 0.02	0.0 ± 0.00	0.0 ± 0.03
Mycena	0.1 ± 0.06	0.3 ± 0.10	0.6 ± 0.20	0.4 ± 0.14	0.4 ± 0.05	0.4 ± 0.08	0.5 ± 0.23	0.4 ± 0.22
Galerina	0.1 ± 0.06	0.1 ± 0.03	0.1 ± 0.02	0.0 ± 0.00	0.1 ± 0.03	0.1 ± 0.03	0.0 ± 0.01	0.1 ± 0.04
Venturia	0.4 ± 0.00	0.1 ± 0.12	0.1 ± 0.06	0.1 ± 0.01	0.1 ± 0.05	0.1 ± 0.04	0.0 ± 0.01	0.1 ± 0.03
Chalara	0.2 ± 0.00	0.1 ± 0.10	0.2 ± 0.09	0.1 ± 0.06	0.1 ± 0.06	0.1 ± 0.08	0.0 ± 0.01	0.1 ± 0.01
Clarodieglomus	0.8 ± 0.44	0.3 ± 0.12	0.7 ± 0.27	0.4 ± 0.15	0.7 ± 0.24	0.5 ± 0.10	0.5 ± 0.32	0.3 ± 0.25

Glomus	1.2 ± 0.54	0.6 ± 0.31	1.2 ± 0.27	0.8 ± 0.17	1.6 ± 0.40	1.4 ± 0.28	0.5 ± 0.30	0.7 ± 0.44
Archaeospora	0.1 ± 0.04	0.0 ± 0.00	0.1 ± 0.04	0.0 ± 0.00	0.0 ± 0.01	0.0 ± 0.00	0.0 ± 0.03	0.0 ± 0.00
Diversispora	0.1 ± 0.06	0.0 ± 0.01	0.1 ± 0.04	0.0 ± 0.01	0.3 ± 0.18	0.0 ± 0.01	0.0 ± 0.03	0.1 ± 0.14
Ambiospora	0.4 ± 0.18	0.2 ± 0.01	0.2 ± 0.10	0.1 ± 0.03	0.3 ± 0.18	0.3 ± 0.05	0.1 ± 0.07	0.1 ± 0.04

References

Cullingham CI, James PMA, Cooke JEK, Coltman DW. **2012**. Characterizing the physical and genetic structure of the lodgepole pine × jack pine hybrid zone: Mosaic structure and differential introgression. *Evolutionary Applications* **5**: 879–891.