

Supplementary Material:



Figure S1. Plot types: living trees (left), storm-felled trees (middle), and standing dead trees killed by *Ips typographus* (right). Photos: Maiju Kosunen.



Figure S2. Soil surface respiration, temperature, and moisture treatment types: living trees (LT, left), storm dead tree detritus (SF_d, second from left), storm open vegetation (SF_o, third from left), standing dead trees killed by *I. typographus* (ID, right). Soil respiration was measured on top of the plastic collar. Photos: Minna Blomqvist and Maiju Kosunen.

Table S1. Soil surface total respiration (SR_{tot}, mg CO₂ m⁻² s⁻¹), temperature (ST, °C), and moisture (SM, % vol) means and standard deviations of each treatment for Paajasensalo (PS) and Viitalampi (VL). LT = living trees, SF_d = storm dead tree detritus, SF_o = storm open-vegetated, ID = trees killed by *Ips typographus*. Superscript intact₁ = intact measurement points at plots established in 2015 (measurements in summer–autumn 2015–2017), tbt₁ = to-be-trenched points at plots established in 2015 (measurements in June–Oct 2015 and May–June 2016), and intact₂ = measurement points in plots established in 2016 (measurements in Aug–Oct 2016, May–Sept 2017, and May–June 2016).

	LT	SF _d	SF _o	ID
	Paajasensalo			
SR _{tot_intact_1}	0.27 ± 0.13	0.22 ± 0.11	0.20 ± 0.08	0.21 ± 0.08
SR _{tot_tbt_1}	0.33 ± 0.11	0.28 ± 0.10	0.19 ± 0.06	0.27 ± 0.08

SR_{tot_intact_2}	0.30 ± 0.18	0.21 ± 0.08	0.15 ± 0.07	0.18 ± 0.08
ST_{intact_1}	10.7 ± 2.1	10.1 ± 1.8	10.3 ± 1.9	10.3 ± 1.9
ST_{tbt_1}	10.7 ± 1.7	10.2 ± 1.5	10.0 ± 1.4	10.5 ± 1.6
ST_{intact_2}	10.2 ± 2.2	9.9 ± 2.4	9.9 ± 2.1	10.1 ± 2.0
SM_{intact_1}	13.3 ± 6.6	21.0 ± 6.7	21.7 ± 7.7	26.8 ± 11.0
SM_{tbt_1}	10.6 ± 4.6	15.2 ± 5.6	22.8 ± 7.3	22.6 ± 7.8
SM_{intact_2}	19.3 ± 6.7	21.0 ± 6.2	27.4 ± 9.2	29.6 ± 7.9
Viitalampi				
SR_{tot_intact_1}	0.23 ± 0.09	0.21 ± 0.08	0.20 ± 0.08	0.23 ± 0.07
SR_{tot_tbt_1}	0.23 ± 0.11	0.19 ± 0.07	0.25 ± 0.11	0.19 ± 0.07
SR_{tot_intact_2}	0.21 ± 0.09	0.15 ± 0.05	0.18 ± 0.07	0.20 ± 0.09
ST_{intact_1}	10.5 ± 1.9	10.3 ± 2.3	10.6 ± 2.1	11.2 ± 2.1
ST_{tbt_1}	10.2 ± 1.4	9.9 ± 1.9	10.3 ± 1.9	10.9 ± 1.7
ST_{intact_2}	10.2 ± 2.2	9.9 ± 2.1	10.1 ± 2.0	10.2 ± 2.2
SM_{intact_1}	23.5 ± 8.6	22.8 ± 5.8	21.9 ± 6.6	27.1 ± 7.3
SM_{tbt_1}	21.3 ± 7.1	23.6 ± 7.5	23.8 ± 7.2	26.5 ± 6.6
SM_{intact_2}	15.8 ± 5.3	35.7 ± 8.4	36.5 ± 9.9	25.6 ± 6.1

Table S2 Spearman correlation coefficients between soil surface total (SR_{tot}) and heterotrophic respiration (SR_h) and soil temperature (ST), and moisture (SM) measured from the intact collars on plots established in 2015 and 2016 during Aug–Oct 2016 and May–Sept 2017 (i.e., a data set that is consistent for each plot), and heterotrophic soil surface respiration (SR_h), soil temperature, and moisture measured from the trenched collars on plots established in 2015 during May–Sept 2017.

Variable	Area	Treatment	SR _{tot}	SR _h
ST	PS	LT	0.83 ***	0.84 ***
ST	PS	SFd	0.77 ***	0.90 ***
ST	PS	SFo	0.71 ***	0.75 ***
ST	PS	ID	0.70 ***	0.85 ***
ST	VL	LT	0.79 ***	0.70 ***
ST	VL	SFd	0.71 ***	0.86 ***
ST	VL	SFo	0.71 ***	0.76 ***
ST	VL	ID	0.75 ***	0.79 ***
SM	PS	LT	0.09	-0.25
SM	PS	SFd	-0.12	-0.16
SM	PS	SFo	-0.14	-0.04
SM	PS	ID	0.00	-0.55 ***
SM	VL	LT	-0.08	-0.37 *
SM	VL	SFd	-0.20 *	-0.54 **

SM	VL	SFo	-0.15	-0.15
SM	VL	ID	-0.03	-0.20
