

Supplementary Information for
*Mixed-severity natural disturbance regime dominates in an old-growth
 Norway spruce forest of North-Western Russia*, by Khakimulina et al.

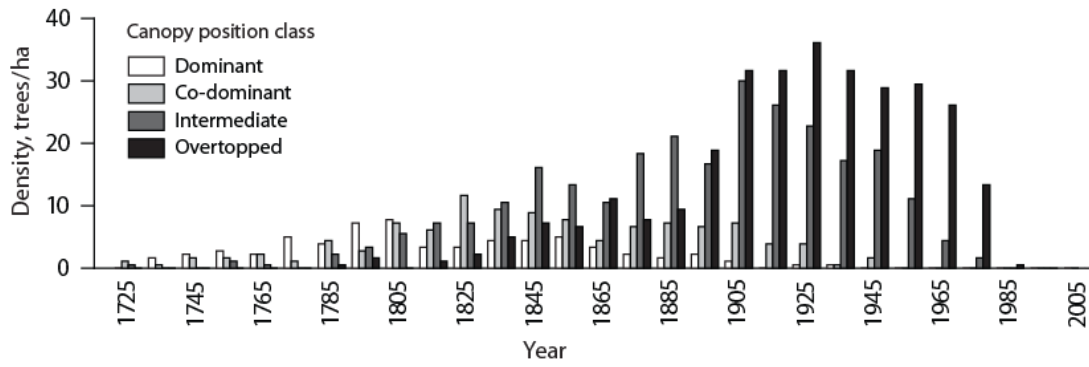
Supplementary Information Table S1.

Transect-specific characteristics of studied stands for the year 2009 and for the period immediately preceding the most recent bark beetle outbreak with the onset in 1999, showing the impact of the outbreak on stand structure. Data for 1999 was back calculated by considering recently dead trees as being alive in 1999 and combining them with currently living trees, those DBH was reconstructed back to 1999. Values in parentheses are percentages for respective absolute values. T indicates transect.

Variables	Stand properties in 1999			Stand properties in 2009			Change between 2001 and 2009		
	T1	T2	T1 + T2	T1	T2	T1 + T2	T1	T2	T1 + T2
<i>Number of trees(n/ha)</i>									
Spruce	762	1024	893	583	862	723	179 (23.5)	162 (15.8)	170 (19.0)
Birch	94	74	84	64	52	58	30 (31.9)	22 (29.7)	26 (31.0)
<i>Total</i>	856	1098	977	647	914	781	209 (24.4)	184 (16.8)	196 (20.1)
<i>Absolute basal area (m²/ha)</i>									
Spruce	26	28	27	14	18	16	12 (46.2)	10 (35.7)	11 (40.7)
Birch	7	7	7	6	5	5.5	1 (14.3)	2 (28.6)	1.5 (21.4)
<i>Total</i>	33	35	34	20	23	21.5	13 (39.4)	12 (34.3)	12.5 (36.8)
<i>Standing volume (m³/ha)</i>									
Spruce	261	274	267	139	169	154	122 (46.7)	105 (38.2)	113 (42.3)
Birch	73	73	74	59	55	57	14 (19.2)	18 (24.7)	17 (23.0)
<i>Total</i>	334	347	341	198	224	211	136 (40.7)	123 (35.4)	130 (38.1)
<i>Mean diameter (cm)</i>									
Spruce	17.7	15.6	16.5	15.4	14.0	14.6	-2.3 (13.0)	-1.6 (10.3)	-1.9 (11.5)
Birch	30.6	32.8	31.6	33.3	33.3	33.3	2.7 (8.8)	0.5 (1.5)	1.7 (5.4)

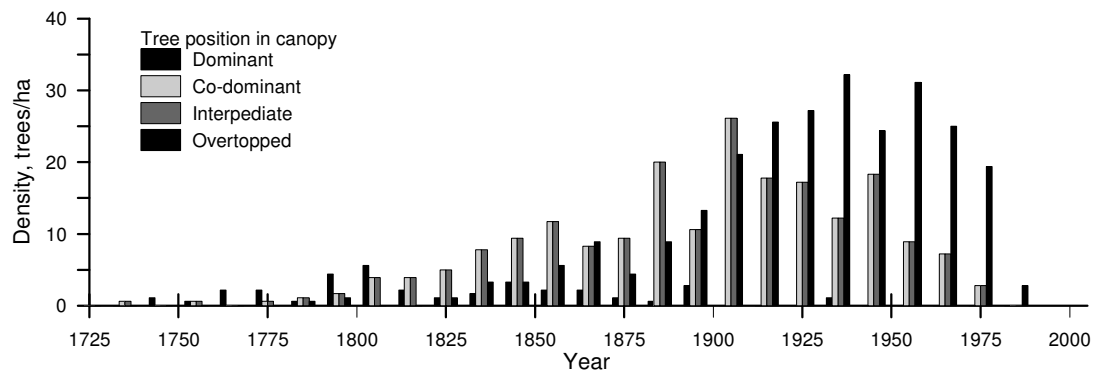
Supplementary Information Figure S1.

Age structure of the spruce population in four canopy position classes (n=1336). The data are combined from two transects and represent ages sampled at the height of 40 cm.



Supplementary Information Figure S2.

Age structure of the spruce population in four canopy position classes, generated using only trees with amount of missing rings-to-pith estimated to be below 10 ($n = 1011$). The data are combined from two transects and represent ages sampled at the height of 40 cm. Wilcoxon Matched Pairs Test revealed no significant differences between distributions obtained on complete (Fig. 2 in the main text of the paper) and reduced datasets. For dominant, co-dominant, intermediate and overtopped trees the corresponding values of Z-statistic and significance levels were $p = 0.50$ & 0.57 , 0.57 & $p = 0.57$, $z = 1.39$ & $p = 0.17$, and $z = 1.46$ & $p = 0.15$, respectively.



Supplementary Information Figure S3.

Verification of the reconstruction quality for gap areas in two transects. Reconstruction was based on evaluation of growth release data and initial growth rates, spatial location data for single trees, and spatial krigging. Data are aggregated for 20x80 m² blocks. Amount of explained variance is presented for each regression.

