

Evidence of climate effects on the height-diameter  
relationships of tree species  
Supplementary Material

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Table SM1: Parameter estimates of the linear function that replaces parameter  $A_{ij}$  in Eq 1.

Species	Intercept	Basal area of other trees	Social status	Square of social status	Slope inclination	Harvest occurrence	Mean temperature	Square of mean temperature	Mean precipitation
<i>Abies alba</i>	$-1.049 \times 10^1$	$1.689 \times 10^{-2}$	-1.414	$1.228 \times 10^{-1}$	$2.733 \times 10^{-3}$	$1.590 \times 10^{-1}$	$8.181 \times 10^{-1}$	$-2.760 \times 10^{-2}$	$2.884 \times 10^{-4}$
<i>Acer campestre</i>	$-1.461 \times 10^1$	$1.202 \times 10^{-2}$	$-5.777 \times 10^{-1}$		$-1.090 \times 10^{-2}$		2.407	$-9.231 \times 10^{-2}$	
<i>Acer monspessulanum</i>	-5.733	$3.527 \times 10^{-2}$			$-7.851 \times 10^{-3}$		1.098	$-3.920 \times 10^{-2}$	
<i>Acer opalus</i>	-2.709	$2.321 \times 10^{-2}$	$-6.186 \times 10^{-1}$		$-7.753 \times 10^{-3}$		$1.634 \times 10^{-1}$		$2.206 \times 10^{-3}$
<i>Acer pseudoplatanus</i>	-6.092	$1.831 \times 10^{-2}$	$-7.181 \times 10^{-1}$		$-6.821 \times 10^{-3}$		1.025	$-4.016 \times 10^{-2}$	
<i>Alnus glutinosa</i>	$-1.366 \times 10^1$	$1.697 \times 10^{-2}$	$-1.525 \times 10^{-1}$	$-1.518 \times 10^{-1}$	$-9.833 \times 10^{-3}$	$2.848 \times 10^{-1}$	2.152	$-7.989 \times 10^{-2}$	
<i>Arbutus unedo</i>	1.187	$1.956 \times 10^{-2}$							
<i>Betula pendula</i>	-5.497	$2.333 \times 10^{-2}$	$-5.591 \times 10^{-2}$	$-1.509 \times 10^{-1}$	$-1.160 \times 10^{-2}$	$1.814 \times 10^{-1}$	1.022	$-3.876 \times 10^{-2}$	
<i>Carpinus betulus</i>	-7.846	$9.897 \times 10^{-3}$	$-1.911 \times 10^{-1}$	$-1.524 \times 10^{-1}$	$-1.374 \times 10^{-2}$	$5.230 \times 10^{-2}$	1.336	$-4.956 \times 10^{-2}$	
<i>Castanea sativa</i>	-5.401	$4.177 \times 10^{-2}$	$7.668 \times 10^{-1}$		$-1.333 \times 10^{-2}$		1.048	$-4.404 \times 10^{-2}$	
<i>Corylus avellana</i>		$4.718 \times 10^{-3}$			$-5.051 \times 10^{-3}$		$4.392 \times 10^{-1}$	$-1.413 \times 10^{-2}$	
<i>Crataegus monogyna</i>	1.284	$3.681 \times 10^{-3}$		$-1.828 \times 10^{-1}$	$-4.028 \times 10^{-3}$				
<i>Fagus sylvatica</i>	-6.601	$1.751 \times 10^{-2}$	-1.142	$7.283 \times 10^{-2}$	$-8.660 \times 10^{-3}$	$2.789 \times 10^{-1}$	$6.730 \times 10^{-1}$	$-1.993 \times 10^{-2}$	$8.884 \times 10^{-4}$
<i>Fraxinus excelsior</i>	-7.387	$7.115 \times 10^{-3}$	$-7.484 \times 10^{-1}$		$-7.751 \times 10^{-3}$	$2.168 \times 10^{-1}$	1.255	$-4.926 \times 10^{-2}$	
<i>Ilex aquifolium</i>	$6.531 \times 10^{-1}$								
<i>Larix decidua</i>	-4.055	$2.704 \times 10^{-2}$	$-7.422 \times 10^{-1}$			$4.726 \times 10^{-1}$	$1.966 \times 10^{-1}$		
<i>Picea abies</i>	-9.862	$2.078 \times 10^{-2}$	-1.356	$1.116 \times 10^{-1}$	$3.092 \times 10^{-3}$	$2.347 \times 10^{-1}$	$8.478 \times 10^{-1}$	$-2.995 \times 10^{-2}$	
<i>Picea sitchensis</i>	-2.589	$2.988 \times 10^{-2}$	$-7.306 \times 10^{-1}$			$4.120 \times 10^{-1}$			
<i>Pinus halepensis</i>	$-2.588 \times 10^1$	$1.161 \times 10^{-1}$					3.007	$-8.922 \times 10^{-2}$	
<i>Pinus nigra</i>	-8.411	$3.202 \times 10^{-2}$	-1.724	$2.432 \times 10^{-1}$	$-3.493 \times 10^{-3}$	$2.129 \times 10^{-1}$	1.011	$-3.830 \times 10^{-2}$	
<i>Pinus nigra</i> var. <i>corsicana</i>	-2.737	$2.976 \times 10^{-2}$	$-5.407 \times 10^{-1}$		$-4.012 \times 10^{-3}$	$2.819 \times 10^{-1}$	$1.145 \times 10^{-1}$		
<i>Pinus pinaster</i>	$-2.318 \times 10^1$	$6.751 \times 10^{-2}$	-1.576	$2.166 \times 10^{-1}$	$-1.136 \times 10^{-2}$	$1.439 \times 10^{-1}$	2.766	$-9.409 \times 10^{-2}$	$1.772 \times 10^{-3}$
<i>Pinus sylvestris</i>	-8.126	$3.787 \times 10^{-2}$	$-6.761 \times 10^{-1}$		$-1.498 \times 10^{-2}$	$5.604 \times 10^{-1}$	1.046	$-3.735 \times 10^{-2}$	
<i>Pinus uncinata</i>	-2.762	$2.229 \times 10^{-2}$		$-1.347 \times 10^{-1}$		$3.423 \times 10^{-1}$	$1.723 \times 10^{-1}$		
<i>Populus tremula</i>	-7.810	$2.078 \times 10^{-2}$	$-6.085 \times 10^{-1}$		$-1.486 \times 10^{-2}$	$1.168 \times 10^{-1}$	1.432	$-5.585 \times 10^{-2}$	
<i>Populus spp.</i>	$7.285 \times 10^{-1}$	$2.665 \times 10^{-2}$	$-3.059 \times 10^{-1}$						
<i>Prunus avium</i>	-7.510	$1.601 \times 10^{-2}$	$-7.251 \times 10^{-1}$		$-8.626 \times 10^{-3}$	$2.890 \times 10^{-1}$	1.213	$-4.865 \times 10^{-2}$	
<i>Pseudotsuga menziesii</i>	$-1.375 \times 10^1$	$2.295 \times 10^{-2}$	-2.524	$3.718 \times 10^{-1}$		$1.693 \times 10^{-1}$	1.635	$-6.229 \times 10^{-2}$	
<i>Quercus ilex</i>		$2.341 \times 10^{-2}$	$-2.983 \times 10^{-1}$						$-6.693 \times 10^{-4}$
<i>Quercus patraea</i>	$-1.197 \times 10^1$	$3.877 \times 10^{-2}$	-1.438	$1.434 \times 10^{-1}$	$-1.418 \times 10^{-2}$	$2.265 \times 10^{-1}$	1.728	$-6.360 \times 10^{-2}$	
<i>Quercus pubescens</i>	$-1.350 \times 10^1$	$3.642 \times 10^{-2}$	$-5.796 \times 10^{-1}$		$-1.216 \times 10^{-2}$	$2.666 \times 10^{-1}$	1.834	$-6.413 \times 10^{-2}$	
<i>Quercus pyrenaica</i>	$-6.137 \times 10^1$	$2.578 \times 10^{-2}$		$-7.384 \times 10^{-2}$			8.511	$-2.974 \times 10^{-1}$	
<i>Quercus robur</i>	$-1.031 \times 10^1$	$4.819 \times 10^{-2}$	$-4.694 \times 10^{-1}$		$-8.912 \times 10^{-3}$	$1.802 \times 10^{-1}$	1.561	$-5.836 \times 10^{-2}$	
<i>Quercus rubra</i>	1.299	$3.018 \times 10^{-2}$	$-3.152 \times 10^{-1}$						
<i>Quercus suber</i>	$9.889 \times 10^{-1}$	$1.240 \times 10^{-2}$			$-6.354 \times 10^{-3}$	$2.107 \times 10^{-1}$	$-7.619 \times 10^{-2}$		$1.173 \times 10^{-3}$
<i>Robinia pseudoacacia</i>	$-1.192 \times 10^1$	$-2.432 \times 10^{-2}$	$-8.936 \times 10^{-1}$		$-7.669 \times 10^{-3}$		1.863	$-6.754 \times 10^{-2}$	
<i>Salix caprea</i>	-4.524	$1.651 \times 10^{-2}$				$2.480 \times 10^{-1}$	1.301	$-5.372 \times 10^{-2}$	
<i>Salix cinerea</i>	2.371	$1.671 \times 10^{-2}$							
<i>Sorbus aria</i>	-3.387	$1.978 \times 10^{-2}$	$-7.277 \times 10^{-1}$		$-1.352 \times 10^{-2}$	$1.658 \times 10^{-1}$	$7.953 \times 10^{-1}$	$-3.209 \times 10^{-2}$	
<i>Sorbus aucuparia</i>	$9.747 \times 10^{-1}$	$2.662 \times 10^{-2}$			$-6.023 \times 10^{-3}$	$3.130 \times 10^{-1}$	$1.011 \times 10^{-1}$		
<i>Sorbus torminalis</i>	$5.794 \times 10^{-1}$	$1.509 \times 10^{-2}$			$-9.981 \times 10^{-3}$	$1.923 \times 10^{-1}$			$1.745 \times 10^{-3}$
<i>Tilia cordata</i>	$-5.195 \times 10^{-1}$	$2.293 \times 10^{-2}$	$-1.483 \times 10^{-1}$	$-1.069 \times 10^{-1}$	$-9.562 \times 10^{-3}$				
<i>Tilia platyphyllos</i>	$-7.061 \times 10^{-1}$	$1.952 \times 10^{-2}$	$-7.162 \times 10^{-1}$		$-5.557 \times 10^{-3}$				
<i>Ulmus minor</i>	1.894	$1.234 \times 10^{-2}$		$-1.393 \times 10^{-1}$	$-7.791 \times 10^{-3}$		$-1.322 \times 10^{-1}$		

Table SM2: Parameter estimates of the linear function that replaces parameter  $B_{ij}$  in Eq 1.

Species	Intercept	Basal area of other trees	Social status
<i>Abies alba</i>	3.164		
<i>Acer campestre</i>	1.302		
<i>Acer monspessulanum</i>	$1.568 \times 10^{-1}$		
<i>Acer opalus</i>	1.133		
<i>Acer pseudoplatanus</i>	1.695		
<i>Alnus glutinosa</i>	1.410		
<i>Arbutus unedo</i>	$1.603 \times 10^{-1}$		
<i>Betula pendula</i>	1.236		
<i>Carpinus betulus</i>	1.381		
<i>Castanea sativa</i>	1.208	$-7.202 \times 10^{-3}$	$-2.991 \times 10^{-1}$
<i>Corylus avellana</i>			
<i>Crataegus monogyna</i>	$5.545 \times 10^{-1}$		
<i>Fagus sylvatica</i>	2.155		
<i>Fraxinus excelsior</i>	1.743	$3.825 \times 10^{-3}$	
<i>Ilex aquifolium</i>	$7.355 \times 10^{-1}$		
<i>Larix decidua</i>	2.140		
<i>Picea abies</i>	3.081		
<i>Picea sitchensis</i>	2.220		
<i>Pinus halepensis</i>	$9.872 \times 10^{-1}$	$-2.438 \times 10^{-2}$	
<i>Pinus nigra</i>	2.071		
<i>Pinus nigra</i> var. <i>corsicana</i>	1.652		
<i>Pinus pinaster</i>	2.274	$-1.154 \times 10^{-2}$	
<i>Pinus sylvestris</i>	1.600		
<i>Pinus uncinata</i>	1.210		
<i>Populus tremula</i>	1.516		
<i>Populus</i> spp.	1.577		
<i>Prunus avium</i>	1.723		
<i>Pseudotsuga menziesii</i>	3.161		
<i>Quercus ilex</i>	$8.418 \times 10^{-1}$		
<i>Quercus patraea</i>	1.955	$-2.373 \times 10^{-3}$	
<i>Quercus pubescens</i>	1.365		
<i>Quercus pyrenaica</i>	1.347		
<i>Quercus robur</i>	1.496	$-7.527 \times 10^{-3}$	
<i>Quercus rubra</i>	1.140		
<i>Quercus suber</i>	$5.401 \times 10^{-1}$		
<i>Robinia pseudoacacia</i>	1.692	$1.132 \times 10^{-2}$	
<i>Salix caprea</i>			
<i>Salix cinerea</i>	$1.275 \times 10^{-1}$		
<i>Sorbus aria</i>	$9.746 \times 10^{-1}$		
<i>Sorbus aucuparia</i>	$3.716 \times 10^{-1}$		
<i>Sorbus torminalis</i>	$8.231 \times 10^{-1}$		
<i>Tilia cordata</i>	1.733		
<i>Tilia platyphyllos</i>	1.917		
<i>Ulmus minor</i>	1.404		

Table SM3: Estimated biases (m) from the cross-validation. Relative values appear in parentheses. Estimated biases in bold are those greater than  $\pm 4\%$ . n/a: non-applicable.

Species	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>Abies alba</i>	0.47 (2.4%)	0.29 (1.5%)	0.36 (1.8%)	0.02 (0.1%)	0.04 (0.2%)	-0.06 (-0.3%)	0.02 (0.1%)	0.34 (1.6%)	0.51 (2.5%)	-0.15 (-0.7%)	-0.09 (-0.4%)
<i>Acer campestre</i>	0.20 (1.5%)	-0.04 (-0.3%)	-0.15 (-1.2%)	-0.12 (-1.0%)	-0.36 (-2.8%)	0.05 (0.4%)	0.21 (1.6%)	0.07 (0.5%)	-0.05 (-0.4%)	-0.04 (-0.3%)	-0.03 (-0.2%)
<i>Acer monspessulanum</i>	0.03 (0.4%)	<b>0.46</b> (5.2%)	0.31 (3.7%)	-0.32 (-3.9%)	<b>0.36</b> (4.2%)	0.22 (2.4%)	0.03 (0.3%)	0.13 (1.5%)	0.14 (1.7%)	<b>-0.54</b> (-6.7%)	<b>-0.39</b> (-4.4%)
<i>Acer opalus</i>	0.02 (0.2%)	0.23 (1.9%)	-0.12 (-1.1%)	0.37 (3.5%)	-0.27 (-2.5%)	<b>0.51</b> (4.6%)	-0.16 (-1.5%)	<b>-0.82</b> (-7.6%)	0.09 (0.8%)	0.30 (2.4%)	-0.06 (-0.5%)
<i>Acer pseudoplatanus</i>	0.22 (1.3%)	0.44 (2.7%)	0.44 (2.6%)	0.23 (1.4%)	0.18 (1.1%)	0.08 (0.5%)	0.35 (2.1%)	-0.19 (-1.2%)	0.41 (2.4%)	-0.04 (-0.2%)	0.18 (1.0%)
<i>Alnus glutinosa</i>	0.39 (2.3%)	0.21 (1.2%)	0.30 (1.7%)	-0.05 (-0.3%)	-0.35 (-2.0%)	0.21 (1.2%)	-0.05 (-0.3%)	0.45 (2.5%)	-0.52 (-3.2%)	-0.61 (-3.4%)	<b>-0.93</b> (-5.3%)
<i>Arbutus unedo</i>	0.11 (1.8%)	-0.06 (-1.0%)	0.19 (3.0%)	0.05 (0.8%)	0.17 (2.7%)	0.10 (1.6%)	0.04 (0.7%)	<b>-0.27</b> (-4.2%)	-0.09 (-1.5%)	-0.18 (-3.2%)	<b>-0.33</b> (-6.1%)
<i>Betula pendula</i>	0.22 (1.4%)	0.38 (2.4%)	0.00 (0.0%)	-0.03 (-0.2%)	0.01 (0.0%)	-0.05 (-0.3%)	-0.14 (-0.9%)	0.31 (2.0%)	-0.02 (-0.2%)	0.24 (1.4%)	0.01 (0.1%)
<i>Carpinus betulus</i>	0.56 (3.8%)	0.30 (2.0%)	0.23 (1.6%)	-0.02 (-0.2%)	-0.13 (-0.8%)	-0.03 (-0.2%)	0.22 (1.4%)	0.24 (1.5%)	0.20 (1.3%)	-0.02 (-0.1%)	0.20 (1.3%)
<i>Castanea sativa</i>	0.44 (3.0%)	-0.05 (-0.4%)	-0.25 (-1.7%)	-0.20 (-1.3%)	-0.05 (-0.3%)	-0.06 (-0.4%)	0.21 (1.3%)	-0.01 (-0.1%)	0.31 (2.0%)	0.32 (2.0%)	-0.04 (-0.2%)
<i>Corylus avellana</i>	<b>0.55</b> (5.8%)	<b>0.39</b> (4.2%)	0.15 (1.7%)	<b>-0.39</b> (-4.5%)	-0.22 (-2.5%)	0.11 (1.3%)	-0.10 (-1.2%)	-0.04 (-0.5%)	-0.02 (-0.2%)	0.07 (0.8%)	0.06 (0.6%)
<i>Crataegus monogyna</i>			<b>0.46</b> (5.9%)	-0.14 (-1.9%)	-0.09 (-1.3%)	-0.06 (-0.8%)	-0.04 (-0.6%)	0.06 (0.7%)	0.01 (0.2%)	-0.25 (-3.4%)	0.25 (3.4%)
<i>Fagus sylvatica</i>	0.50 (2.6%)	0.31 (1.7%)	0.24 (1.3%)	0.07 (0.4%)	0.01 (0.1%)	0.26 (1.4%)	0.26 (1.4%)	0.39 (2.0%)	0.17 (0.9%)	0.12 (0.6%)	0.30 (1.4%)
<i>Fragaria vesicaria</i>	0.78 (4.0%)	0.68 (3.7%)	0.41 (2.2%)	0.23 (1.3%)	0.00 (0.0%)	0.16 (0.9%)	0.34 (1.8%)	0.23 (1.3%)	0.13 (0.7%)	-0.03 (-0.2%)	-0.05 (-0.3%)
<i>Ilex aquifolium</i>			<b>0.54</b> (6.8%)	0.11 (1.5%)	-0.16 (-2.3%)	0.12 (1.6%)	0.15 (1.9%)	0.10 (1.3%)	0.17 (2.2%)	-0.01 (-0.2%)	-0.03 (-0.5%)
<i>Larix decidua</i>	0.24 (1.2%)	0.10 (0.5%)	0.61 (3.3%)	-0.52 (-3.0%)	0.18 (0.9%)	0.02 (0.1%)	0.16 (0.9%)	0.07 (0.4%)	-0.34 (-1.7%)	-0.46 (-2.5%)	0.03 (0.1%)
<i>Picea abies</i>	0.16 (0.8%)	0.15 (0.8%)	0.38 (1.9%)	0.15 (0.7%)	0.31 (1.5%)	0.06 (0.3%)	0.24 (1.1%)	0.22 (1.1%)	0.75 (3.5%)	0.00 (0.0%)	0.45 (2.0%)
<i>Picea sitchensis</i>	-0.11 (-0.6%)	-0.04 (-0.2%)	-0.52 (-2.6%)	<b>1.43</b> (6.8%)	-0.46 (-2.3%)	-0.41 (-1.9%)	-0.58 (-3.0%)	0.07 (0.3%)	<b>1.17</b> (5.8%)	-0.54 (-2.5%)	-0.19 (-0.8%)
<i>Pinus halepensis</i>	0.22 (1.8%)	0.24 (1.9%)	0.54 (4.0%)	0.04 (0.3%)	0.08 (0.6%)	-0.15 (-1.2%)	-0.01 (-0.1%)	-0.35 (-2.9%)	-0.32 (-2.6%)	-0.13 (-1.0%)	-0.03 (-0.2%)
<i>Pinus nigra</i>	<b>-0.65</b> (-4.6%)	-0.38 (-2.8%)	<b>-0.68</b> (-4.9%)	-0.15 (-1.1%)	0.29 (2.1%)	-0.17 (-1.2%)	-0.10 (-0.6%)	<b>0.69</b> (4.7%)	0.30 (2.1%)	0.38 (2.5%)	0.15 (1.0%)
<i>Pinus nigra</i> var. <i>corsicana</i>	<b>-1.05</b> (-7.3%)	0.13 (0.8%)	-0.07 (-0.4%)	-0.18 (-1.1%)	-0.08 (-0.4%)	-0.45 (-2.8%)	-0.02 (-0.1%)	0.62 (3.7%)	0.11 (0.7%)	<b>1.31</b> (7.0%)	0.42 (2.3%)
<i>Pinus pinaster</i>	0.08 (0.5%)	-0.01 (0.0%)	-0.02 (-0.1%)	-0.27 (-1.6%)	-0.14 (-0.8%)	0.20 (1.1%)	0.05 (0.3%)	-0.21 (-1.2%)	-0.09 (-0.6%)	0.09 (0.5%)	0.05 (0.3%)
<i>Pinus sylvestris</i>	-0.30 (-2.0%)	-0.51 (-3.6%)	-0.49 (-3.5%)	-0.22 (-1.5%)	-0.32 (-2.2%)	-0.06 (-0.4%)	0.03 (0.2%)	-0.05 (-0.3%)	-0.15 (-1.0%)	0.20 (1.2%)	0.05 (0.3%)
<i>Pinus uncinata</i>	<b>1.19</b> (10.6%)	0.19 (1.8%)	<b>-0.48</b> (-4.9%)	0.03 (0.3%)	-0.36 (-3.3%)	<b>0.47</b> (4.4%)	<b>-0.47</b> (-4.8%)	-0.03 (-0.4%)	<b>-0.78</b> (-7.6%)	0.02 (0.2%)	0.07 (0.6%)
<i>Populus spp.</i>	0.35 (1.3%)	1.03 (4.8%)	0.30 (1.2%)	0.81 (3.2%)	-0.08 (-0.3%)	-0.46 (-1.9%)	-0.14 (-0.6%)	-0.21 (-0.8%)	0.45 (1.8%)	<b>1.90</b> (6.8%)	-0.91 (-3.6%)
<i>Populus tremula</i>	0.05 (0.3%)	0.39 (2.2%)	0.23 (1.3%)	0.40 (2.3%)	-0.23 (-1.3%)	-0.30 (-1.7%)	-0.12 (-0.7%)	0.25 (1.4%)	0.16 (0.9%)	0.70 (3.5%)	-0.22 (-1.2%)
<i>Prunus avium</i>	0.36 (2.3%)	0.37 (2.5%)	0.33 (2.2%)	-0.30 (-2.1%)	-0.53 (-3.7%)	-0.55 (-3.9%)	-0.07 (-0.5%)	0.13 (0.8%)	-0.09 (-0.6%)	0.22 (1.4%)	-0.08 (-0.5%)
<i>Pseudotsuga menziesii</i>	0.48 (2.3%)	-0.02 (-0.1%)	-0.29 (-1.4%)	-0.19 (-0.9%)	-0.11 (-0.5%)	-0.21 (-0.9%)	0.31 (1.4%)	0.36 (1.6%)	0.97 (4.0%)	0.53 (2.2%)	0.55 (2.2%)
<i>Quercus ilex</i>	<b>0.62</b> (7.3%)	0.26 (3.1%)	0.22 (2.8%)	-0.07 (-1.0%)	0.07 (1.0%)	<b>0.34</b> (4.5%)	0.04 (0.6%)	-0.05 (-0.6%)	-0.05 (-0.6%)	-0.04 (-0.5%)	-0.06 (-0.8%)
<i>Quercus patraea</i>	0.23 (1.2%)	0.21 (1.1%)	0.07 (0.4%)	-0.16 (-0.8%)	-0.15 (-0.7%)	-0.01 (-0.1%)	0.20 (1.0%)	0.17 (0.8%)	0.17 (0.8%)	0.49 (2.2%)	0.30 (1.4%)
<i>Quercus pubescens</i>	0.13 (1.2%)	-0.09 (-0.8%)	-0.08 (-0.8%)	0.04 (0.4%)	-0.27 (-2.3%)	0.31 (2.6%)	<b>0.55</b> (4.3%)	0.12 (1.0%)	0.18 (1.5%)	0.10 (0.8%)	0.13 (1.1%)
<i>Quercus pyrenaica</i>	<b>0.62</b> (4.5%)	-0.13 (-1.0%)	0.06 (0.5%)	-0.18 (-1.3%)	-0.12 (-0.8%)	0.09 (0.6%)	0.06 (0.5%)	0.50 (3.3%)	<b>-0.69</b> (-5.6%)	-0.08 (-0.6%)	0.43 (2.6%)
<i>Quercus robur</i>	0.30 (1.6%)	0.24 (1.3%)	0.08 (0.4%)	-0.02 (-0.1%)	-0.17 (-0.9%)	-0.09 (-0.5%)	-0.02 (-0.1%)	0.25 (1.3%)	0.03 (0.2%)	0.17 (0.9%)	0.42 (2.1%)
<i>Quercus rubra</i>	<b>0.75</b> (4.1%)	0.24 (1.4%)	0.41 (2.2%)	<b>0.76</b> (4.2%)	<b>0.95</b> (5.4%)	-0.63 (-3.6%)	0.05 (0.3%)	<b>-1.38</b> (-9.5%)	0.75 (4.0%)	0.35 (1.9%)	<b>1.56</b> (7.4%)
<i>Quercus suber</i>	0.08 (0.9%)	<b>-0.44</b> (-5.8%)	0.13 (1.6%)	-0.01 (-0.1%)	0.05 (0.6%)	-0.06 (-0.7%)	<b>0.45</b> (5.4%)	<b>-0.43</b> (-5.9%)	-0.28 (-3.5%)	<b>-0.60</b> (-8.2%)	0.15 (1.7%)
<i>Robinia pseudoacacia</i>	<b>0.86</b> (5.2%)	0.32 (2.0%)	0.14 (0.9%)	0.55 (3.3%)	-0.16 (-1.0%)	-0.07 (-0.5%)	0.16 (1.0%)	0.01 (0.1%)	0.07 (0.5%)	-0.38 (-2.2%)	-0.49 (-2.9%)
<i>Salix caprea</i>	<b>0.69</b> (5.9%)	-0.03 (-0.3%)	0.14 (1.3%)	-0.05 (-0.5%)	-0.28 (-2.5%)	-0.14 (-1.3%)	<b>-0.70</b> (-6.8%)	-0.22 (-2.0%)	-0.31 (-2.9%)	-0.38 (-3.4%)	-0.37 (-3.3%)
<i>Salix cinerea</i>	<b>1.26</b> (11.4%)	<b>0.67</b> (6.0%)	-0.07 (-0.8%)	<b>0.92</b> (8.3%)	<b>-0.61</b> (-6.7%)	0.01 (0.1%)	-0.30 (-3.2%)	-0.08 (-0.8%)	<b>-0.56</b> (-6.2%)	0.18 (1.7%)	0.01 (0.1%)
<i>Sorbus aria</i>	0.04 (0.4%)	-0.11 (-1.1%)	-0.02 (-0.2%)	0.00 (0.0%)	0.21 (2.0%)	0.21 (2.1%)	0.30 (2.9%)	0.05 (0.5%)	0.01 (0.1%)	-0.16 (-1.6%)	0.04 (0.4%)
<i>Sorbus aucuparia</i>	<b>0.73</b> (6.5%)	0.15 (1.4%)	-0.13 (-1.3%)	<b>-0.41</b> (-4.1%)	-0.29 (-2.9%)	-0.31 (-3.1%)	-0.31 (-3.2%)	-0.13 (-1.3%)	<b>-0.42</b> (-4.6%)	0.03 (0.3%)	0.09 (0.9%)
<i>Sorbus torminalis</i>	<b>0.52</b> (4.5%)	0.03 (0.3%)	-0.17 (-1.6%)	0.20 (1.8%)	0.09 (0.8%)	-0.32 (-3.0%)	0.27 (2.4%)	0.10 (0.9%)	-0.30 (-2.8%)	0.00 (0.0%)	0.02 (0.2%)
<i>Tilia cordata</i>	0.60 (3.6%)	0.26 (1.7%)	0.31 (1.9%)	-0.44 (-2.8%)	0.01 (0.1%)	0.55 (3.4%)	-0.21 (-1.4%)	0.10 (0.9%)	0.24 (1.5%)	0.56 (3.3%)	-0.18 (-1.0%)
<i>Tilia platyphyllos</i>	0.03 (0.2%)	0.49 (3.2%)	0.02 (0.1%)	-0.41 (-2.7%)	0.09 (0.6%)	0.13 (0.8%)	0.27 (1.7%)	0.13 (0.8%)	-0.05 (-0.3%)	-0.02 (-0.1%)	0.12 (0.7%)
<i>Ulmus minor</i>	0.37 (3.2%)	0.39 (3.4%)	-0.11 (-1.0%)	<b>-0.46</b> (-4.3%)	-0.38 (-3.6%)	0.14 (1.2%)	0.30 (2.6%)	0.27 (2.4%)	0.07 (0.6%)	-0.08 (-0.7%)	<b>-0.73</b> (-6.6%)

Table SM4: Estimated root mean square errors (m) from the cross-validation. Relative root mean square errors appear in parentheses. n/a: non-applicable.

Species	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<i>Abies alba</i>	3.1 (16%)	3.1 (16%)	3.2 (17%)	3.2 (17%)	3.2 (16%)	3.0 (16%)	3.1 (16%)	3.4 (17%)	3.2 (16%)	3.6 (16%)	3.6 (16%)
<i>Acer campestre</i>	2.6 (19%)	2.7 (20%)	2.8 (22%)	2.9 (23%)	2.9 (23%)	2.7 (21%)	2.8 (21%)	2.8 (21%)	2.7 (21%)	2.9 (22%)	3.1 (22%)
<i>Acer monspessulanum</i>	1.4 (19%)	1.9 (22%)	2.2 (26%)	1.9 (24%)	1.6 (19%)	2.0 (22%)	2.1 (24%)	1.8 (22%)	1.8 (22%)	1.6 (21%)	1.8 (21%)
<i>Acer opalus</i>	2.1 (20%)	2.5 (20%)	2.7 (26%)	2.2 (21%)	2.1 (19%)	2.4 (21%)	2.2 (21%)	2.2 (21%)	2.2 (19%)	2.8 (22%)	2.6 (22%)
<i>Acer pseudoplatanus</i>	3.0 (18%)	3.3 (20%)	3.2 (19%)	3.5 (21%)	3.3 (20%)	2.8 (16%)	3.5 (21%)	2.9 (18%)	3.1 (19%)	3.2 (18%)	3.7 (21%)
<i>Alnus glutinosa</i>	3.7 (22%)	3.9 (23%)	3.8 (22%)	3.7 (22%)	3.7 (21%)	3.8 (21%)	3.7 (22%)	3.6 (20%)	3.7 (23%)	4.0 (22%)	4.4 (25%)
<i>Arbutus unedo</i>	1.7 (28%)	1.2 (20%)	1.2 (20%)	1.2 (20%)	1.4 (23%)	1.5 (24%)	1.3 (21%)	1.2 (19%)	1.4 (23%)	1.2 (22%)	1.2 (21%)
<i>Betula pendula</i>	2.7 (18%)	2.7 (17%)	2.8 (18%)	2.9 (19%)	2.8 (18%)	2.9 (19%)	2.9 (19%)	2.9 (18%)	2.8 (18%)	3.1 (18%)	3.1 (19%)
<i>Carpinus betulus</i>	2.9 (19%)	2.8 (19%)	3.0 (21%)	3.0 (21%)	3.0 (20%)	3.2 (21%)	3.1 (20%)	3.0 (19%)	3.2 (20%)	3.3 (21%)	3.2 (20%)
<i>Castanea sativa</i>	3.5 (23%)	3.4 (24%)	3.5 (24%)	3.7 (25%)	3.7 (24%)	3.6 (23%)	3.6 (23%)	3.7 (24%)	3.8 (24%)	3.7 (23%)	3.9 (24%)
<i>Corylus avellana</i>	1.8 (19%)	1.9 (21%)	1.7 (19%)	1.9 (22%)	1.8 (21%)	1.8 (20%)	1.7 (19%)	1.8 (21%)	1.8 (20%)	1.9 (21%)	2.0 (22%)
<i>Crataegus monogyna</i>			1.9 (24%)	1.6 (22%)	1.6 (23%)	1.6 (22%)	1.8 (24%)	1.7 (23%)	1.7 (24%)	1.7 (23%)	1.8 (24%)
<i>Fagus sylvatica</i>	3.7 (19%)	3.7 (20%)	3.8 (20%)	3.7 (20%)	3.7 (20%)	3.7 (19%)	3.8 (20%)	4.0 (20%)	3.8 (20%)	4.0 (19%)	4.1 (20%)
<i>Fraxinus excelsior</i>	3.7 (19%)	3.7 (20%)	3.7 (20%)	3.8 (21%)	3.9 (21%)	3.7 (20%)	3.6 (19%)	3.8 (21%)	3.9 (21%)	3.9 (20%)	4.0 (20%)
<i>Ilex aquifolium</i>			1.9 (23%)	1.7 (24%)	1.6 (22%)	1.6 (22%)	1.7 (21%)	1.7 (23%)	1.5 (19%)	1.5 (21%)	1.5 (21%)
<i>Larix decidua</i>	3.3 (17%)	3.5 (18%)	3.8 (21%)	3.2 (18%)	3.7 (19%)	3.9 (22%)	4.1 (23%)	3.8 (21%)	3.7 (19%)	4.4 (24%)	4.6 (23%)
<i>Picea abies</i>	3.3 (17%)	3.3 (16%)	3.4 (17%)	3.4 (17%)	3.6 (17%)	3.5 (17%)	3.6 (17%)	3.6 (17%)	3.5 (16%)	3.8 (17%)	3.7 (16%)
<i>Picea sitchensis</i>	3.5 (18%)	3.1 (17%)	3.4 (17%)	3.3 (16%)	3.6 (18%)	3.1 (15%)	3.6 (19%)	4.2 (19%)	4.0 (20%)	3.1 (14%)	3.5 (15%)
<i>Pinus halepensis</i>	2.1 (18%)	2.5 (20%)	2.8 (21%)	2.2 (18%)	2.6 (21%)	2.4 (19%)	2.5 (20%)	2.3 (19%)	2.7 (22%)	2.7 (22%)	2.3 (18%)
<i>Pinus nigra</i>	3.0 (21%)	2.6 (19%)	2.8 (20%)	2.7 (20%)	2.7 (20%)	2.7 (18%)	2.7 (18%)	3.1 (21%)	3.0 (21%)	2.9 (19%)	2.9 (19%)
<i>Pinus nigra var. corsicana</i>	3.2 (22%)	3.5 (23%)	3.7 (23%)	3.4 (22%)	3.8 (22%)	3.4 (21%)	2.9 (19%)	3.5 (21%)	3.5 (22%)	5.0 (27%)	3.5 (19%)
<i>Pinus pinaster</i>	2.9 (16%)	2.5 (15%)	2.8 (16%)	2.7 (16%)	2.9 (17%)	2.8 (16%)	2.7 (16%)	2.7 (16%)	2.7 (16%)	2.9 (16%)	3.1 (16%)
<i>Pinus sylvestris</i>	3.6 (25%)	3.6 (25%)	3.5 (25%)	3.5 (25%)	3.7 (25%)	3.4 (22%)	3.7 (24%)	3.5 (23%)	3.6 (24%)	3.8 (24%)	4.1 (25%)
<i>Pinus uncinata</i>	2.9 (25%)	2.7 (26%)	2.6 (26%)	2.3 (21%)	2.8 (26%)	2.8 (26%)	2.3 (23%)	2.5 (25%)	2.5 (25%)	2.5 (21%)	2.7 (24%)
<i>Populus spp.</i>	4.9 (19%)	4.2 (16%)	4.6 (18%)	3.7 (15%)	3.9 (17%)	5.4 (22%)	4.5 (19%)	3.9 (16%)	4.5 (18%)	4.9 (18%)	4.3 (17%)
<i>Populus tremula</i>	2.9 (17%)	3.2 (18%)	3.2 (18%)	2.9 (16%)	3.2 (18%)	3.0 (17%)	3.0 (17%)	3.2 (17%)	2.9 (16%)	3.2 (16%)	4.0 (21%)
<i>Prunus avium</i>	3.2 (21%)	3.2 (22%)	3.3 (22%)	3.3 (23%)	3.6 (25%)	3.4 (24%)	3.3 (22%)	3.2 (22%)	3.2 (21%)	3.4 (21%)	3.4 (22%)
<i>Pseudotsuga menziesii</i>	3.0 (15%)	3.1 (15%)	3.5 (17%)	3.3 (16%)	3.5 (16%)	3.4 (15%)	3.2 (14%)	3.4 (15%)	3.2 (13%)	3.5 (14%)	3.4 (13%)
<i>Quercus ilex</i>	2.3 (27%)	2.2 (26%)	2.0 (26%)	2.1 (28%)	2.0 (28%)	2.0 (26%)	1.9 (26%)	1.8 (26%)	2.4 (33%)	2.1 (27%)	1.9 (26%)
<i>Quercus patraea</i>	3.3 (17%)	3.3 (17%)	3.5 (18%)	3.4 (17%)	3.6 (18%)	3.3 (16%)	3.5 (18%)	3.4 (17%)	3.3 (16%)	3.6 (16%)	3.6 (17%)
<i>Quercus pubescens</i>	2.8 (26%)	2.7 (25%)	2.9 (27%)	3.1 (27%)	3.0 (26%)	3.1 (26%)	3.1 (25%)	3.1 (26%)	3.0 (25%)	3.0 (25%)	3.4 (28%)
<i>Quercus pyrenaica</i>	2.8 (20%)	2.4 (18%)	3.1 (23%)	2.9 (21%)	3.4 (24%)	2.9 (21%)	2.7 (20%)	3.0 (20%)	2.5 (20%)	3.1 (21%)	2.9 (18%)
<i>Quercus robur</i>	3.4 (18%)	3.6 (19%)	3.7 (20%)	3.6 (20%)	3.6 (20%)	3.6 (19%)	3.7 (20%)	3.8 (20%)	3.7 (20%)	3.8 (19%)	4.0 (19%)
<i>Quercus rubra</i>	2.4 (13%)	2.5 (15%)	2.7 (15%)	3.1 (17%)	3.3 (19%)	2.3 (13%)	3.4 (19%)	3.1 (21%)	3.5 (19%)	3.3 (18%)	3.8 (18%)
<i>Quercus suber</i>	2.0 (23%)	1.6 (21%)	1.9 (23%)	1.7 (21%)	1.9 (23%)	2.1 (25%)	2.0 (24%)	1.6 (22%)	1.9 (24%)	2.0 (27%)	2.2 (24%)
<i>Robinia pseudoacacia</i>	3.3 (20%)	3.4 (21%)	3.3 (21%)	3.5 (21%)	3.7 (23%)	3.5 (22%)	3.7 (22%)	3.4 (22%)	3.3 (21%)	3.7 (22%)	3.7 (22%)
<i>Salix caprea</i>	2.6 (22%)	3.0 (26%)	2.8 (26%)	2.8 (26%)	2.9 (27%)	2.9 (26%)	3.0 (29%)	2.9 (26%)	2.9 (27%)	3.4 (30%)	3.1 (28%)
<i>Salix cinerea</i>	2.7 (24%)	2.2 (20%)	2.1 (23%)	3.9 (35%)	2.6 (29%)	2.7 (29%)	2.2 (24%)	1.9 (20%)	2.0 (23%)	2.9 (27%)	2.9 (30%)
<i>Sorbus aria</i>	2.2 (22%)	2.3 (24%)	2.3 (24%)	2.3 (24%)	2.4 (23%)	2.3 (23%)	2.3 (23%)	2.4 (24%)	2.5 (25%)	2.3 (23%)	2.5 (24%)
<i>Sorbus aucuparia</i>	2.5 (23%)	2.5 (23%)	2.7 (27%)	2.5 (25%)	2.6 (27%)	2.0 (20%)	2.2 (22%)	2.6 (26%)	2.1 (24%)	2.1 (20%)	2.2 (22%)
<i>Sorbus torminalis</i>	2.3 (20%)	2.4 (21%)	2.3 (22%)	2.2 (19%)	2.3 (21%)	2.2 (20%)	2.4 (21%)	2.4 (21%)	2.3 (22%)	2.2 (19%)	1.9 (17%)
<i>Tilia cordata</i>	3.4 (21%)	3.0 (19%)	2.9 (18%)	3.1 (20%)	2.9 (18%)	3.3 (21%)	3.1 (21%)	3.6 (22%)	3.3 (20%)	2.9 (17%)	4.1 (23%)
<i>Tilia platyphyllos</i>	3.6 (22%)	2.9 (18%)	2.9 (18%)	3.2 (21%)	3.3 (21%)	3.0 (19%)	3.1 (20%)	2.8 (19%)	3.6 (23%)	3.4 (19%)	4.3 (25%)
<i>Ulmus minor</i>	2.4 (21%)	2.7 (23%)	2.6 (23%)	2.6 (24%)	2.5 (23%)	2.9 (25%)	2.7 (23%)	2.8 (24%)	2.7 (25%)	3.1 (27%)	2.8 (25%)

Table SM5: Covariance parameter estimates and estimated DBH for variance parity between the plot and the residual levels.

Species	$\widehat{\sigma}_{\text{plot}}^2$	$\widehat{\sigma}_{\text{res}}^2$	DBH for variance parity (cm)
<i>Abies alba</i>	0.4562	5.0238	26.6
<i>Acer campestre</i>	0.5561	3.3081	10.5
<i>Acer monspessulanum</i>	0.3321	1.2767	6.1
<i>Acer opalus</i>	0.4650	1.5542	5.2
<i>Acer pseudoplatanus</i>	0.6050	4.5825	14.7
<i>Alnus glutinosa</i>	0.8245	5.7389	13.0
<i>Arbutus unedo</i>	0.1946	0.6603	5.3
<i>Betula pendula</i>	0.6336	3.0446	8.0
<i>Carpinus betulus</i>	0.5534	4.7359	17.6
<i>Castanea sativa</i>	0.7771	4.5852	10.3
<i>Corylus avellana</i>	0.3168	1.6115	8.5
<i>Crataegus monogyna</i>	0.2829	1.3563	7.9
<i>Fagus sylvatica</i>	0.6868	6.1405	18.9
<i>Fraxinus excelsior</i>	0.8046	5.7101	13.4
<i>Ilex aquifolium</i>	0.2061	1.3692	12.2
<i>Larix decidua</i>	0.6526	6.1333	20.4
<i>Picea abies</i>	0.5832	5.5799	21.0
<i>Picea sitchensis</i>	0.7502	3.6508	8.1
<i>Pinus halepensis</i>	0.3176	2.0956	12.0
<i>Pinus nigra</i>	0.4935	2.4609	8.3
<i>Pinus nigra</i> var. <i>corsicana</i>	0.7751	3.0988	6.4
<i>Pinus pinaster</i>	0.4494	2.3341	8.8
<i>Pinus sylvestris</i>	0.8558	3.6469	6.9
<i>Pinus uncinata</i>	0.3665	2.9550	16.1
<i>Populus</i> spp.	1.0404	5.9732	10.0
<i>Populus tremula</i>	0.6955	3.2950	7.8
<i>Prunus avium</i>	0.7998	3.7102	7.6
<i>Pseudotsuga menziesii</i>	0.6052	3.8075	11.3
<i>Quercus ilex</i>	0.2469	1.4855	10.6
<i>Quercus patraea</i>	0.6605	4.0276	10.8
<i>Quercus pubescens</i>	0.6680	2.6939	6.4
<i>Quercus pyrenaica</i>	0.5906	2.6920	7.5
<i>Quercus robur</i>	0.7357	4.8451	12.0
<i>Quercus rubra</i>	0.5496	4.1804	14.8
<i>Quercus suber</i>	0.1851	1.2886	13.0
<i>Robinia pseudoacacia</i>	0.7590	5.1085	12.4
<i>Salix caprea</i>	0.7823	2.6706	5.3
<i>Salix cinerea</i>	0.4066	3.0518	14.5
<i>Sorbus aria</i>	0.6109	1.5782	4.0
<i>Sorbus aucuparia</i>	0.5581	2.1675	6.2
<i>Sorbus torminalis</i>	0.5088	1.8428	5.7
<i>Tilia cordata</i>	0.6024	5.0726	17.2
<i>Tilia platyphyllos</i>	0.6072	4.8219	15.7
<i>Ulmus minor</i>	0.5682	3.1927	9.7