

## Supporting information

**Table S1.** Mycorrhizal types (AM, arbuscular mycorrhizae; EcM, ectomycorrhizae) of species of tree seedlings during forest succession.

Species	Mycorrhizal type	Reference
<i>Abies nephrolepis</i>	EcM	FRED3.0
<i>Acer barbinerve</i>	AM	FRED3.0
<i>Acer komarovii</i>	AM	FRED3.0
<i>Acer mandshuricum</i>	AM	Qin et al.
<i>Acer mono</i>	AM	Qin et al.
<i>Acer pseudosieboldianum</i>	AM	FRED3.0
<i>Acer tegmentosum</i>	AM	FRED3.0
<i>Acer ukurunduense</i>	AM	Qin et al.
<i>Betula costata</i>	EcM	FRED3.0
<i>Betula dahurica</i>	EcM	FRED3.0
<i>Betula platyphylla</i>	EcM	FRED3.0
<i>Cerasus maximowiczii</i>	AM	Ren et al.
<i>Fraxinus mandschurica</i>	AM	FRED3.0
<i>Maackia amurensis</i>	AM	FRED3.0
<i>Malus baccata</i>	AM	FRED3.0
<i>Padus avium</i>	AM	Jiang et al.
<i>Phellodendron amurense</i>	AM	FRED3.0
<i>Picea jezoensis</i> Carr. var. <i>microsperma</i>	EcM	FRED3.0
<i>Pinus koraiensis</i>	EcM	FRED3.0
<i>Populus davidiana</i>	EcM	FRED3.0
<i>Quercus mongolica</i>	EcM	FRED3.0
<i>Tilia amurensis</i>	EcM	FRED3.0
<i>Tilia mandshurica</i>	EcM	Qin et al.
<i>Ulmus davidiana</i> var. <i>japonica</i>	EcM	Qin et al.
<i>Ulmus laciniata</i>	EcM	Qin et al.

**Table S2.** Soil variables at different stages of forest succession (mean  $\pm$  standard error).

	Early stage	Mid stage	Late stage
Organic matter (%)	16.790 $\pm$ 0.403	17.225 $\pm$ 0.378	9.510 $\pm$ 0.365
Total nitrogen (%)	0.306 $\pm$ 0.006	0.485 $\pm$ 0.013	0.410 $\pm$ 0.014
Total phosphorus (%)	0.079 $\pm$ 0.002	0.051 $\pm$ 0.001	0.087 $\pm$ 0.004
Total potassium (%)	2.162 $\pm$ 0.027	2.278 $\pm$ 0.027	2.024 $\pm$ 0.013
Soil pH	5.347 $\pm$ 0.012	5.217 $\pm$ 0.016	5.310 $\pm$ 0.0358

**Table S3.** Canopy openness (%) at different stages of forest succession (mean  $\pm$  standard error).

	Early stage	Mid stage	Late stage
2013	12.45 $\pm$ 0.10	12.05 $\pm$ 0.11	— —
2018	11.17 $\pm$ 0.15	10.61 $\pm$ 0.17	10.91 $\pm$ 0.15

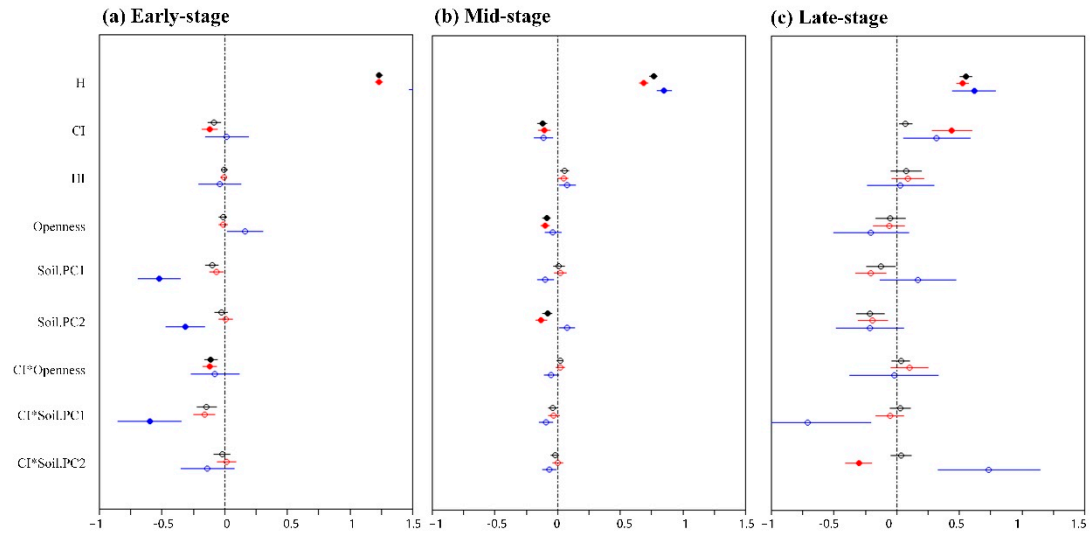
**Table S4.** AIC and BIC values for GLMMs of seedling survival at four neighborhood radii (5, 10, 15, 20 m) at different stages of forest succession.  $\Delta$ AIC and  $\Delta$ BIC are the values of AIC and BIC of models, respectively, with 5-, 10-, and 15-m neighborhood radii minus those with the 20-m neighborhood radius. Bold indicates the optimal scale of the model. AM, arbuscular mycorrhizae; EcM, ectomycorrhizae.

Stage of succession	Level	Radius (m)	AIC	$\Delta$ AIC	BIC	$\Delta$ BIC
Early stage	Community	5	24067.09	2815.62	24175.76	2816.82
		10	22437.73	1186.26	22545.75	1186.81
		15	21652.43	400.96	21760.08	401.14
		<b>20</b>	<b>21251.47</b>	<b>0.00</b>	<b>21358.94</b>	<b>0.00</b>
	AM	5	22981.56	2491.63	23089.62	2492.68
		10	21539.94	1050.01	21647.43	1050.49
		15	20871.64	381.71	20978.82	381.88
		<b>20</b>	<b>20489.93</b>	<b>0.00</b>	<b>20596.94</b>	<b>0.00</b>
	EcM	5	957.25	295.93	1025.73	300.52
		10	780.02	118.70	846.27	121.06
		15	680.75	19.43	744.97	19.76
		<b>20</b>	<b>661.32</b>	<b>0.00</b>	<b>725.21</b>	<b>0.00</b>
Mid stage	Community	5	14385.20	2659.22	14484.38	2661.89
		10	13198.69	1472.71	13296.58	1474.10
		15	11779.21	53.23	11875.79	53.31
		<b>20</b>	<b>11725.98</b>	<b>0.00</b>	<b>11822.48</b>	<b>0.00</b>
	AM	5	10538.17	2064.70	10630.77	2067.29
		10	9589.87	1116.40	9681.31	1117.83
		15	8506.05	32.58	8596.13	32.65
		<b>20</b>	<b>8473.47</b>	<b>0.00</b>	<b>8563.48</b>	<b>0.00</b>
	EcM	5	3795.19	573.33	3882.35	576.13
		10	3570.22	348.36	3655.91	349.69
		15	3246.14	24.28	3330.57	24.35
		<b>20</b>	<b>3221.86</b>	<b>0.00</b>	<b>3306.22</b>	<b>0.00</b>
Late stage	Community	5	3521.13	0.37	3605.10	0.37
		10	3521.37	0.61	3605.33	0.61
		<b>15</b>	<b>3520.76</b>	<b>0.00</b>	<b>3604.73</b>	<b>0.00</b>
		20	3521.79	1.02	3605.75	1.02
	AM	<b>5</b>	<b>3203.37</b>	<b>0.00</b>	<b>3286.22</b>	<b>0.00</b>
		10	3212.91	9.54	3295.76	9.54

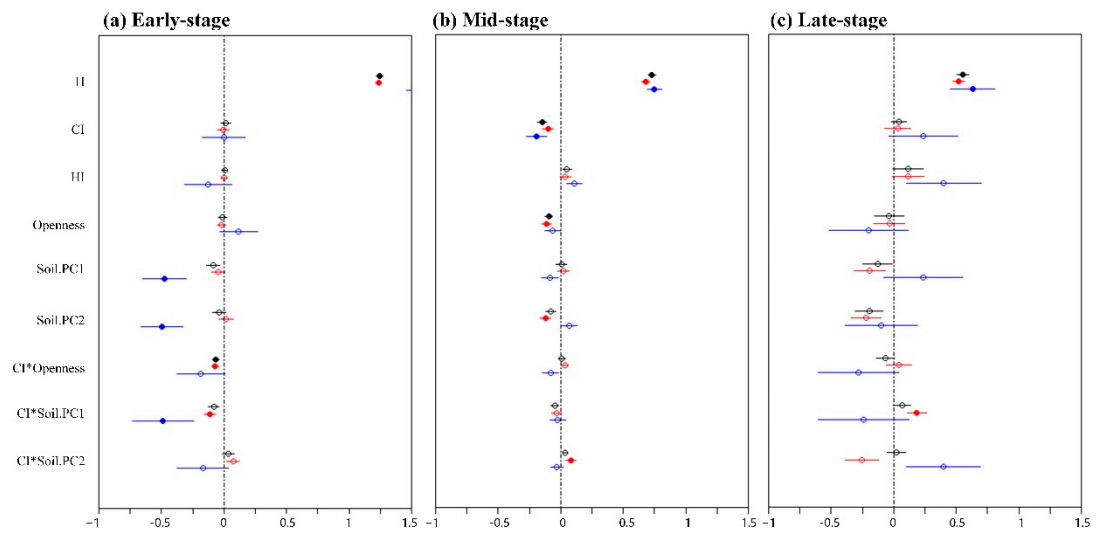
	15	3218.42	15.05	3301.27	15.05
	20	3219.24	15.87	3302.09	15.87
EcM	5	286.43	1.59	337.96	1.59
	10	285.26	0.42	336.79	0.42
	<b>15</b>	<b>284.84</b>	<b>0.00</b>	<b>336.37</b>	<b>0.00</b>
	20	286.72	1.88	338.24	1.87

AIC: Akaike Information Criterion, BIC: Bayesian Information Criterion, GLMMs: Generalized Linear Mixed Models

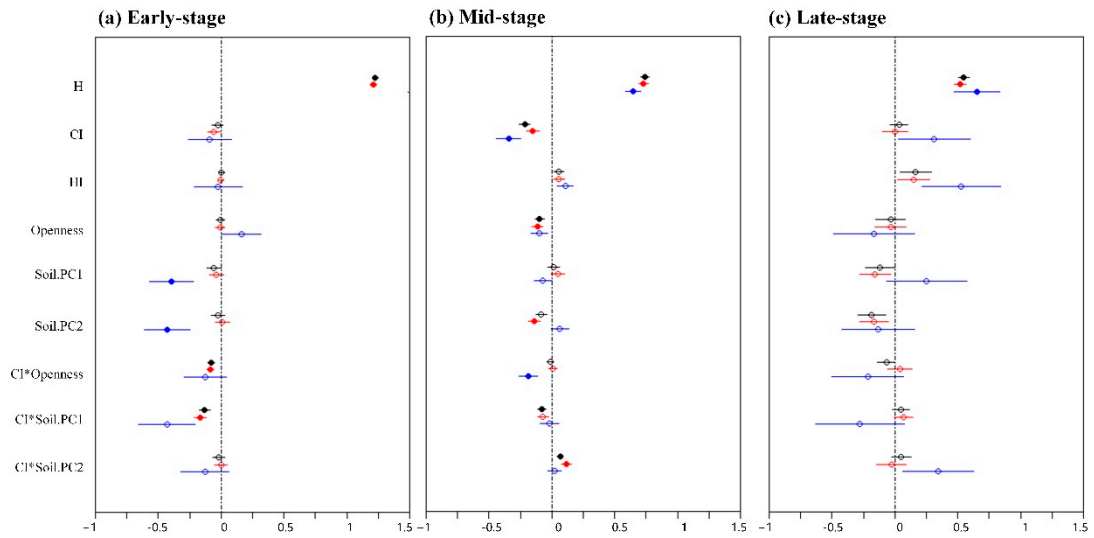
Neighborhood radius = 5 m



Neighborhood radius = 10 m



Neighborhood radius = 15 m



**Figure S1.** Estimated coefficients (mean  $\pm$  SE) of biotic and abiotic variables on seedling survival at different neighborhood radii in different stages of forest succession. Black circles indicate the community level (i.e., all species combined), red circles AM seedlings, and blue circles EcM seedlings. Solid circles indicate significance ( $p < 0.05$ ); circles with '+' indicate marginal significance ( $p < 0.10$ ); and hollow circles indicate no significance ( $p \geq 0.10$ ).