

Supplementary file S1

Table S1. Information about the different management treatments after the establishment phase and the time for the last inventory. PCT = pre-commercial thinning, and CT = commercial thinning.

Site	Shelterwood removed ¹	PCT ²	CT	Fenced	Inventory (month, year)
6	Yes	Yes ³	No	No	Feb-23
7	Yes	Yes ³	No	No	Feb-23
11	Yes	Yes ³	No	No	Feb-23
15	Yes	Yes	Yes	Yes	Dec-22
16	Yes	Yes	No	No	Nov-22
4	Yes	Yes	No	No	Nov-22
17	Yes	Yes	No	No	Nov-22
18	Yes	Yes ³	No	No	Nov-22
20	Yes	Yes	No	No	Nov-22
23	No	No	No	No	Jul-23
24:1	No	No	No	No	Jul-23
24:2	No	No	No	No	Jul-23

¹ At the time of remeasurement, the shelterwood overstory in the northern sites had not yet been removed

² Evidence of pre-commercial thinning (PCT) was recorded where visible; however, due to snow cover during fieldwork at the southern sites, thinning operations may have occurred without being detectable

³ Probably pre-commercially thinned. However, snow cover made it impossible to detect stumps

Volume functions for small trees in southern Sweden:

$$Va_{(SP)} = 0.22 + 0.1066 * dbh^2 + 0.02085 * dbh^2 h + 0.008427 * dbh * h^2$$

$$Va_{(NS)} = 0.22 + 0.1086 * dbh^2 + 0.01712 * dbh^2 h + 0.008905 * dbh * h^2$$

$$Va_{(B)} = 0.22 + 0.1086 * dbh^2 + 0.01712 * dbh^2 h + 0.008905 * dbh * h^2$$

Va is the calculated volume (dm³) for the different species at the southern and central sites, dbh is the measured diameter (cm), and h the estimated height (m).

Volume functions for small trees in northern Sweden:

$$Va_{(SP)} = 0.22 + 0.8786 * dbh^2 + 0.03045 * dbh^2 h + 0.002809 * dbh * h^2$$

$$Va_{(NS)} = 0.22 + 0.1150 * dbh^2 + 0.01410 * dbh^2 h + 0.001047 * dbh * h^2$$

$$Va_{(B)} = 0.11 + 0.09929 * dbh^2 + 0.006405 * dbh^2 h + 0.01382 * dbh * h^2$$

Va is the calculated volume (dm³) for the different species at the northern sites, dbh is the measured diameter (DBH) in cm, and h is the estimated height (m).

Volume functions for large trees in southern Sweden:

$$Vb_{(SP)} = 10^{-1.38903} * dbh^{1.84493} *$$

$$Vb_{(NS)} = 10^{-1.02039} * dbh^{2.00128} *$$

$$Vb_{(B)} = 10^{-0.89363} * dbh^{2.23818} *$$

Vb is the calculated volume (dm³) for the different species at the southern and central sites, dbh is the measured diameter (DBH) in cm, and h is the estimated height in m.

Volume functions for large trees in northern Sweden:

$$Vb_{(SP)} = 10^{-1.20914} * dbh^{1.94740} *$$

$$Vb_{(NS)} = 10^{-0.79783} * dbh^{2.07157} *$$

$$Vb_{(B)} = 10^{-0.84627} * dbh^{2.23818} *$$

Vb is the calculated volume (dm³) for the different species at the southern and central sites, dbh is the measured diameter (DBH) in cm, and h is the estimated height in m.

Smoothing function, for all trees:

$$Vs = Va * (5 - dbh) + Vb * (dbh - 4)$$

Vs is the calculated volume (dm³) for the different species at the different sites, Va is the calculated volume for smaller trees, Vb the calculated volume for larger trees and dbh the measured diameter (DBH) in cm.

Table S2. Stand density (stems ha⁻¹) and SE per location, main-treatment, and species. The number of observations is 5 for the southern (except for treatment CC which had 4), 4 for the central and 3 for the northern region.

Tree species	North			
	CC	C _{MSP}	SW	SW _{MSP}
Norway spruce	1925 ± 362	1875 ± 345	2175 ± 1 242	2792 ± 117
Scots pine	400 ± 123	1233 ± 688	367 ± 55	1683 ± 501
Birch spp.	1333 ± 360	3625 ± 2560	1633 ± 1334	1717 ± 748
Other	367 ± 164	275 ± 76	733 ± 608	342 ± 71
Total	4025 ± 494	7008 ± 2823	4908 ± 3225	6533 ± 598

Tree species	South				Central			
	CC	C _{MSP}	SW	SW _{MSP}	CC	C _{MSP}	SW	SW _{MSP}
Norway spruce	2063 ± 278	2043 ± 349	1790 ± 236	1575 ± 151	1048 ± 127	1602 ± 273	1954 ± 367	2145 ± 389
Scots pine	38 ± 16	22 ± 10	65 ± 34	250 ± 194	1425 ± 698	773 ± 174	533 ± 142	577 ± 107
Birch spp.	838 ± 353	943 ± 753	1180 ± 802	1735 ± 1394	1477 ± 916	1558 ± 344	1779 ± 1070	2498 ± 993
Other	19 ± 12	0 ± 0	15 ± 15	70 ± 53	50 ± 40	48 ± 13	102 ± 42	31 ± 99
Total	2956 ± 576	3008 ± 1016	3050 ± 709	3630 ± 1473	4000 ± 1464	3981 ± 383	4369 ± 1150	5252 ± 1037

Table S3. Analysis of variance for stand density. Level of significance is $p < 0.05$ and showcased in bold.

Region	Parameters	F-value	DenDF	p-value
All ¹	HarvestingTreatment	0.112	7	0.748
	SitePreparation	1.420	14	0.253
	Site:HarvestingTreatment	0.213	14	0.652
South	HarvestingTreatment	0.001	3	0.980
	SitePreparation	0.345	6	0.576
	Site:HarvestingTreatment	0.255	6	0.632
Central	HarvestingTreatment	0.375	3	0.584
	SitePreparation	0.900	6	0.379
	Site:HarvestingTreatment	0.045	6	0.839
North	HarvestingTreatment	0.088	2	0.795
	SitePreparation	4.391	4	0.104
	Site:HarvestingTreatment	0.299	4	0.614

¹Region all equals the southern and central region together

Table S4. Stand volume ($\text{m}^3 \text{ha}^{-1}$) and SE per location, main-treatment, and species. The number of observations is 5 for the southern (except for treatment CC which had 4), 4 for the central and 3 for the northern region.

Tree species	North			
	CC	C _{MSP}	SW	SW _{MSP}
Norway spruce	24.7 ± 9.9	27.4 ± 7.3	8.9 ± 4.8	22.2 ± 7.1
Scots pine	4.9 ± 2.4	18.7 ± 11.6	0.3 ± 0.1	2.9 ± 0.9
Birch spp.	2.4 ± 1.3	3.6 ± 3.3	3.9 ± 2.6	6.2 ± 2.6
Other	2.2 ± 2.1	0.2 ± 0.1	1.1 ± 1.1	0.2 ± 0.1
Total	34.3 ± 14.9	50.0 ± 7.7	14.2 ± 8.5	31.4 ± 10.3

Tree species	South				Central			
	CC	C _{MSP}	SW	SW _{MSP}	CC	C _{MSP}	SW	SW _{MSP}
Norway spruce	96.3 ± 7.2	120.6 ± 20.9	70.6 ± 10.4	73.2 ± 20.5	70.4 ± 23.2	82.8 ± 22.2	69.6 ± 17.5	74.0 ± 13.3
Scots pine	2.0 ± 1.4	1.2 ± 0.7	0.4 ± 0.3	0.2 ± 0.2	57.4 ± 14.0	34.1 ± 9.4	22.1 ± 9.4	18.0 ± 6.5
Birch spp.	1.9 ± 1.0	5.7 ± 3.6	4.8 ± 3.6	1.6 ± 0.5	4.5 ± 1.3	4.6 ± 1.3	7.3 ± 4.2	6.0 ± 3.8
Other	0.7 ± 0.7	0.0 ± 0.0	0.0 ± 0.0	0.1 ± 0.1	0.0 ± 0.0	0.0 ± 0.0	1.4 ± 1.3	0.9 ± 0.9
Total	100.9 ± 7.3	127.5 ± 23.8	75.9 ± 11.2	75.1 ± 20.1	132.2 ± 14.8	121.5 ± 28.4	100.3 ± 27.8	98.9 ± 13.2

Table S5. Analysis of variance for volume. Level of significance is $p < 0.05$ and showcased in bold.

Region	Parameters	F-value	DenDF	p-value
All ¹	HarvestingTreatment	3.376	7	0.109
	SitePreparation	0.403	14	0.536
	Site:HarvestingTreatment	0.034	14	0.857
South	HarvestingTreatment	14.001	3	0.033
	SitePreparation	0.154	6	0.708
	Site:HarvestingTreatment	0.724	6	0.428
Central	HarvestingTreatment	0.910	3	0.410
	SitePreparation	0.214	6	0.660
	Site:HarvestingTreatment	0.129	6	0.732
North	HarvestingTreatment	23.140	2	0.041
	SitePreparation	16.806	4	0.015
	Site:HarvestingTreatment	0.036	4	0.859

¹Region all equals the southern and central region together

Table S6. Analysis of variance for quadratic mean diameter (QMD). Level of significance is $p < 0.05$ and showcased in bold.

Region	Parameters	F-value	DenDF	p-value
All ¹	HarvestingTreatment	3.542	7	0.102
	SitePreparation	0.348	45	0.558
	Site:HarvestingTreatment	0.170	45	0.683
	Tree species	18.236	45	9.956*e⁻⁰⁵
South	HarvestingTreatment	3.926	3.755	0.123
	SitePreparation	0.020	22.7	0.888
	Site:HarvestingTreatment	0.421	22.7	0.523
	Tree species	29.308	23.1	1.654*e⁻⁰⁵
Central	HarvestingTreatment	1.048	3	0.381
	SitePreparation	0.441	21	0.514
	Site:HarvestingTreatment	0.024	21	0.879
	Tree species	0.775	21	0.389
North	HarvestingTreatment	8.951	2	0.096
	SitePreparation	3.803	15	0.070
	Site:HarvestingTreatment	0.112	15	0.742
	Tree species	8.143	15	0.012

¹Region all equals the southern and central region together

Table S7. Analysis of variance for Lorey's hight (H_L). Level of significance is $p < 0.05$ and showcased in bold.

Region	Parameters	F-value	DenDF	p-value
All ¹	HarvestingTreatment	3.711	7	0.096
	SitePreparation	0.070	41.2	0.792
	Site:HarvestingTreatment	0.053	41.2	0.820
	Tree species	19.005	42	8.255*e⁻⁰⁵
South	HarvestingTreatment	7.321	10.8	0.021
	SitePreparation	2.116	33.4	0.155
	Site:HarvestingTreatment	0.947	33.4	0.337
	Tree species	24.388	43.8	1.194*e⁻⁰⁵
Central	HarvestingTreatment	5.541	10.3	0.040
	SitePreparation	1.194	33.0	0.282
	Site:HarvestingTreatment	0.289	33.2	0.596
	Tree species	5.439	34.1	0.026
North	HarvestingTreatment	4.699	10.9	0.054
	SitePreparation	3.704	28.5	0.064
	Site:HarvestingTreatment	0.005	28.7	0.943
	Tree species	6.572	28.7	0.016

¹Region all equals the southern and central region together

Table S8. Basal area ($\text{m}^2 \text{ha}^{-1}$) and SE per location, main-treatment, and species. The number of observations is 5 for the southern (except for treatment CC which had 4), 4 for the central and 3 for the northern region.

Tree species	South				Central			
	CC	C _{MSP}	SW	SW _{MSP}	CC	C _{MSP}	SW	SW _{MSP}
Norway spruce	16.4 ± 0.6	18.5 ± 2.1	13.0 ± 1.3	12.5 ± 3.1	10.9 ± 3.5	13.6 ± 3.0	12.2 ± 2.5	13.7 ± 1.9
Scots pine	0.4 ± 0.2	0.2 ± 0.1	0.1 ± 0.1	0.1 ± 0.1	10.5 ± 2.9	6.0 ± 1.5	4.0 ± 1.7	3.3 ± 1.2
Birch spp.	0.5 ± 0.3	1.1 ± 0.6	1.0 ± 0.8	0.4 ± 0.1	1.0 ± 0.3	1.0 ± 0.3	1.4 ± 0.7	1.4 ± 0.9
Other	0.1 ± 0.1	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	0.0 ± 0.0	0.2 ± 0.2	0.2 ± 0.2
Total	17.4 ± 0.5	19.8 ± 2.6	14.1 ± 1.3	13.0 ± 3.0	22.4 ± 1.0	20.6 ± 3.5	17.8 ± 4.3	18.5 ± 1.8

Tree species	North			
	CC	C _{MSP}	SW	SW _{MSP}
Norway spruce	6.1 ± 2.0	7.3 ± 1.9	2.7 ± 1.5	5.8 ± 1.3
Scots pine	1.2 ± 0.6	4.2 ± 2.6	0.1 ± 0.0	0.8 ± 0.3
Birch spp.	0.6 ± 0.3	0.9 ± 0.8	1.0 ± 0.7	1.4 ± 0.5
Other	0.5 ± 0.5	0.1 ± 0.0	0.3 ± 0.3	0.0 ± 0.0
Total	8.4 ± 3.2	12.4 ± 1.5	4.1 ± 2.4	8.1 ± 2.0

Table S9. Analysis of variance for basal area. Level of significance is $p < 0.05$ and showcased in bold.

Region	Parameters	F-value	DenDF	p-value
All ¹	HarvestingTreatment	3.401	7	0.108
	SitePreparation	0.620	14	0.444
	Site:HarvestingTreatment	0.002	14	0.965
South	HarvestingTreatment	8.527	3	0.061
	SitePreparation	1.078	6	0.339
	Site:HarvestingTreatment	0.889	6	0.382
Central	HarvestingTreatment	0.806	3	0.435
	SitePreparation	0.061	6	0.813
	Site:HarvestingTreatment	0.420	6	0.541
North	HarvestingTreatment	23.406	2	0.040
	SitePreparation	20.052	4	0.011
	Site:HarvestingTreatment	0.002	4	0.965

¹Region all equals the southern and central region together

Table S10. Timber prices for *Pinus sylvestris* and *Picea abies* for different diameter classes and qualities. The prices are from the Södra forest owners association.

Diameter class (cm)	<i>P. sylvestris</i> (EUR/ m ³ fub ¹)		<i>P. abies</i> (EUR/ m ³ fub ¹)
	Quality 1	Quality 2	Quality 1 & 2
18	96.8	92.4	99.8
20	105.0	92.6	103.3
22	112.0	93.7	106.8
24	116.4	94.6	109.9
26	120.7	95.5	111.6
28	120.7	96.3	112.5
30	125.1	96.8	113.3
32	125.1	97.2	114.2
34	125.1	97.6	114.6
36	125.1	97.6	115.1
38+	112.0	92.4	97.6

¹ m³fub equals volume of log excluding bark

Table S11. Pulp wood prices for *Pinus sylvestris*, *Picea abies* and *Betula* spp.

Tree species	(EUR/ m ³ fub ¹)
<i>Pinus sylvestris</i>	52.3
<i>Picea abies</i>	52.3
<i>Betula</i> spp.	52.3

¹ m³fub equals volume of log excluding bark