



Finnish Forest Research Institute

METLA

# FOREST FINLAND

IN BRIEF

2013

## FOREST FINLAND IN BRIEF

*Forest Finland in Brief* is a biennial publication that provides concise information on forestry and the forest industry in Finland. It is based on statistical data and includes international comparisons. For a more detailed description, the reader is referred to the *Finnish Statistical Yearbook of Forestry*, which includes some 250 tables and 100 figures.

Ideal growing conditions for conifers, easily workable and valuable tree species, good harvesting conditions and infrastructure, and accessibility to major European markets all combine to make forests a major source of prosperity and well-being in Finland.

Over 60% of Finland's commercial forests are held by non-industrial private forest owners. These small-scale family forest holdings number about 320 000. The annual stumpage income of about EUR 1.4 billion is therefore widely distributed, benefiting a considerable number of forest owners. This is particularly important for rural areas, where alternative sources of income are few.

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## INTERNATIONAL CONTEXT

### Major producers and traders

Finland, with its 23 million forest hectares, is an important supplier of forest products to global markets. Its boreal coniferous forests, which include a significant proportion of broad-leaved species, would permit annual removals of over 60 million m<sup>3</sup> (u.b.) on a sustainable basis. Moreover, the infrastructure for roundwood procurement is good. The Finnish forest industry is also highly export-oriented, and in most sectors of the industry, 65% to 90% of production goes abroad. Finland is a major exporter of sawn softwood and paper, particularly graphic papers.

### Global roundwood production in 2011

(million m<sup>3</sup> under bark):

Industrial wood	1 578	Softwood	1 171
Fuelwood & charcoal	1 891	Hardwood	2 298
	<b>3 469</b>		<b>3 469</b>

The total value of the global export trade of forest products amounted to USD 246 billion (f.o.b) in 2011, of which Finland's share was 5.7%. In the following tables, the Russian Federation is included in Europe.

### World production of softwood, 2011

<b>World</b>	<b>1 171</b>	mill. m <sup>3</sup> u.b.
<b>Europe</b>	<b>464</b>	
USA	198	
Russia	142	
China	141	
Canada	119	
Sweden	65	
Brazil	53	
Germany	42	
<b>Finland</b>	<b>40</b>	

### World imports of roundwood and wood chips, 2011

<b>World</b>	<b>187.5</b>	mill. m <sup>3</sup> u.b.
<b>Europe</b>	<b>75.2</b>	
China	55.9	
Japan	25.6	
Austria	9.7	
<b>Finland</b>	<b>9.2</b>	
Sweden	9.0	
Korea Rep.	8.7	
Germany	8.5	
Canada	6.4	

## World production of sawn softwood, 2011

<b>World</b>	<b>290.1</b>	mill. m <sup>3</sup>
<b>Europe</b>	<b>130.1</b>	
USA	45.4	
Canada	38.0	
Russia	29.1	
Germany	21.6	
China	17.9	
Sweden	16.7	
India	9.9	
<b>Finland</b>	<b>9.7</b>	
Austria	9.5	
Japan	9.3	
Brazil	9.1	

## World exports of sawn softwood, 2011

<b>World</b>	<b>99.4</b>	mill. m <sup>3</sup>
<b>Europe</b>	<b>66.0</b>	
Canada	23.8	
Russia	18.8	
Sweden	11.7	
Germany	6.7	
<b>Finland</b>	<b>6.1</b>	
Austria	5.6	
Czech Rep.	3.1	
USA	3.0	
Chile	2.7	
Romania	2.3	
Latvia	1.9	

## World production of paper and paperboard, 2011

<b>World</b>	<b>403.2</b>	mill. tonnes
<b>Europe</b>	<b>106.6</b>	
China	103.1	
USA	77.4	
Japan	26.6	
Germany	22.7	
Canada	12.1	
Indonesia	11.5	
Korea Rep.	11.5	
<b>Finland</b>	<b>11.3</b>	
Sweden	11.3	
India	10.9	
Brazil	10.2	

## World exports of paper and paperboard, 2011

<b>World</b>	<b>112.0</b>	mill. tonnes
<b>Europe</b>	<b>66.9</b>	
USA	13.9	
Germany	13.3	
<b>Finland</b>	<b>10.5</b>	
Sweden	10.5	
Canada	9.1	
China	5.6	
France	4.6	
Austria	4.0	
Indonesia	3.7	
Belgium	3.2	
Italy	3.1	

Source: FAO Yearbook. Forest Products 2011

## Value of global exports of forest industry products, 2011

	USD billion	USD per capita
<b>World</b>	<b>245.9</b>	<b>36</b>
<b>Europe</b>	<b>128.7</b>	<b>174</b>
USA	26.1	84
Canada	22.7	666
Germany	21.9	268
Sweden	17.3	1 845
<b>Finland</b>	<b>14.1</b>	<b>2 643</b>
China	12.9	10
Russia	9.7	68

Source: FAO  
Yearbook. Forest  
Products 2011

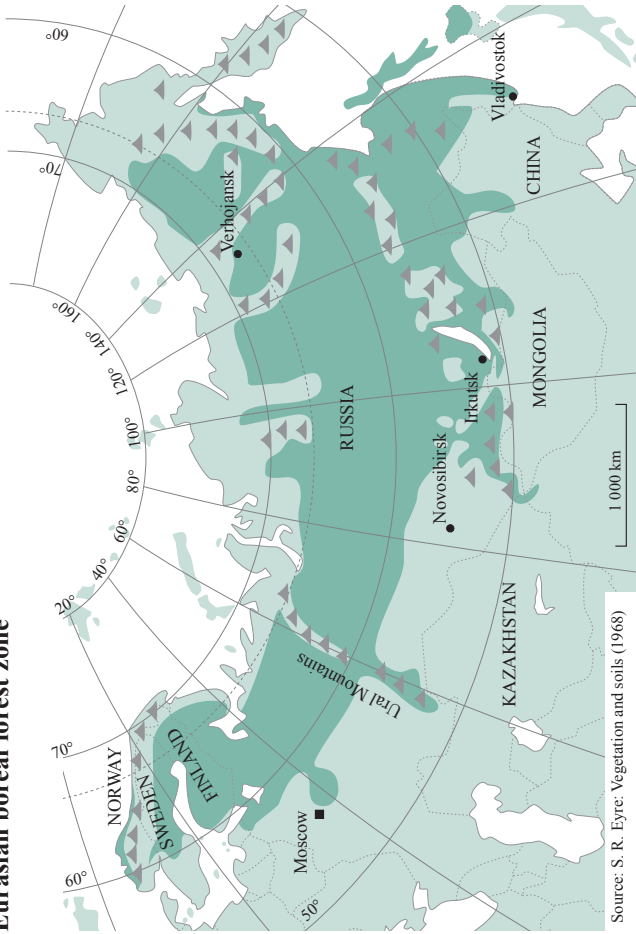
## Eurasian boreal forest zone

The Eurasian boreal forest zone extends from the Atlantic coast of Norway to the Russian Pacific coast, a distance of about 9 000 km. In the Nordic countries, the width of the zone is about 1 000 km (60°–70° N); in the east it gradually extends southwards, reaching 50° N in eastern Siberia.

This huge coniferous forest zone of about 900 million hectares is one of the most important providers of roundwood in the world. Scots pine and Norway spruce dominate in the zone's European and western Siberian sections. The most important species in eastern Siberia is the Siberian larch, and in the Russian Far East the Dahurian larch. In the mountainous Far East, the forests are mostly inaccessible.

About 80% of the forests of Norway and Sweden, and almost all the forests of Finland and the Russian Federation belong to the boreal coniferous forest zone. Due to the limited availability of comparable regional forestry information solely on boreal forests, the figures in the next table are national figures.

## Eurasian boreal forest zone



Source: S. R. Eyre: Vegetation and soils (1968)

## Forest resources of the countries within the Eurasian boreal forest zone, 2010

---

	Forests, total	%	Forests available for wood supply
Forest land, mill. ha		of land area	
Norway	10.1	34	6.4
Sweden	28.6	70	20.6
Finland	22.1	73	19.9
Russia	809.1	49	677.2
<b>Total</b>	<b>870.1</b>	<b>50</b>	<b>724.1</b>

### Growing stock on forest land, mill. m<sup>3</sup> over bark

Norway	997	797
Sweden	3 243	2 651
Finland	2 207	2 024
Russia	81 523	68 234
<b>Total</b>	<b>87 970</b>	<b>73 706</b>

### Net annual increment on forest land, mill. m<sup>3</sup> o.b.

Norway	21.9
Sweden	96.5
Finland	91.0
Russia	852.9
<b>Total</b>	<b>1062.3</b>

### Fellings<sup>1</sup>, mill. m<sup>3</sup> o.b./yr

Norway	11.0
Sweden	80.9
Finland	59.4
Russia	170.0
<b>Total</b>	<b>321.3</b>

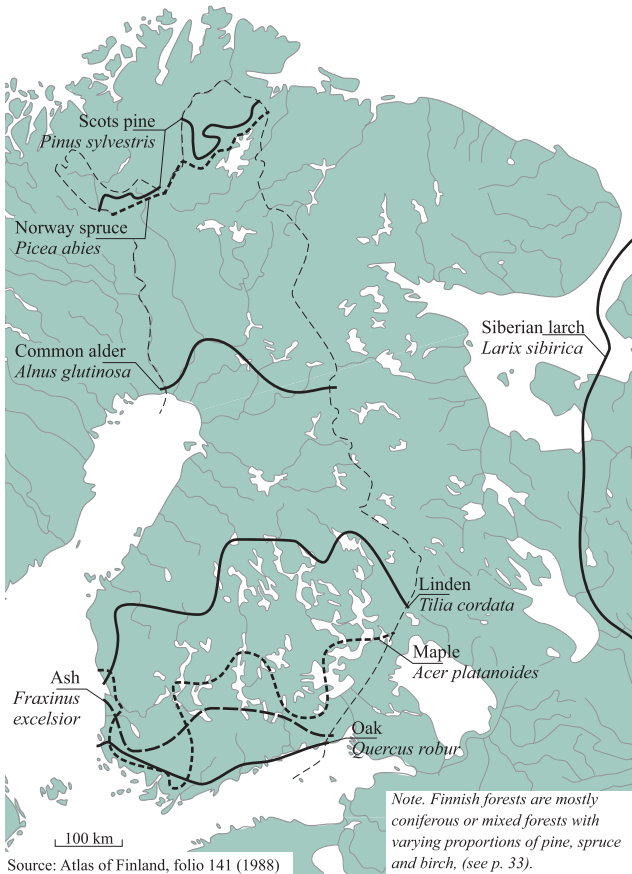
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Source: State of Europe's Forests 2011 (UNECE/FAO)

<sup>1</sup> total of stemwood cut, incl. pre-commercial thinnings



## Northern limits of selected tree species in Finland and western limit of Siberian larch



Source: Atlas of Finland, folio 141 (1988)

## Combined deposition of sulphur and nitrogen in the Nordic and the Baltic countries in 2010, in eq/ha/yr



Sources: Finnish Meteorological Institute,  
EMEP / MSC-West

The depositions are combined as equivalent in relation to their potentially acidifying effect. For example, 500 eq/ha/yr is equivalent to 8 kg (S)/ha/yr.

The European Union, which Finland joined in 1995, is the most important customer region for Finnish forest-industry products, accounting for 40–50% of Finland’s sawnwood exports and 60–65% of paper and paperboard exports. A strong focus on customers and markets has also led to considerable Finnish investments in forest-product manufacturing in Europe (see p. 14). The EU’s eastward enlargements in 2004 and 2007 brought an additional 30 million hectares of commercial forests into the Union.

### Forests available for wood supply in the European Union, 2010

Country	Forest area mill. ha	Growing stock mill. m <sup>3</sup> o.b.	Net increment mill. m <sup>3</sup> o.b.	Fellings <sup>1</sup> mill. m <sup>3</sup> o.b.
Austria	3.3	1 107	25.1	23.5
Belgium	0.7	164	5.3	3.9
Bulgaria	2.9	435	14.7	7.8
Cyprus	0.0	3	0.0	0.0
Czech Republic	2.3	738	23.1	17.9
Denmark	0.6	112	5.8	2.4
Estonia	2.0	398	11.2	5.7
Finland	19.9	2 024	91.0	59.4
France	15.1	2 453	94.4	64.3
Germany	10.6	3 466	107.0	59.6
Greece	3.6	170	3.8	1.8
Hungary	1.7	259	11.1	6.9
Ireland	0.7	74	5.2	2.8
Italy	8.1	1 285	32.5	12.8
Latvia	3.1	584	16.5	12.4
Lithuania	1.9	408	10.8	8.6
Luxembourg	0.1	15	0.7	0.2
Malta	0.0	0	0.0	0.0
Netherlands	0.3	56	2.3	1.6
Poland	8.5	2 092	67.6	40.7
Portugal	1.8	154	18.9	14.2
Romania	5.2	1 100	34.6	17.2
Slovakia	1.8	478	13.2	10.4
Slovenia	1.2	390	9.2	3.4
Spain	14.9	784	45.8	16.6
Sweden	20.6	2 651	96.5	80.9
United Kingdom	2.4	340	20.7	10.5
<b>EU total</b>	<b>133.3</b>	<b>21 740</b>	<b>767.0</b>	<b>485.5</b>

<sup>1</sup> total of stemwood cut, incl. pre-commercial thinnings

Source: State of Europe’s Forests 2011 (UNECE, FAO)

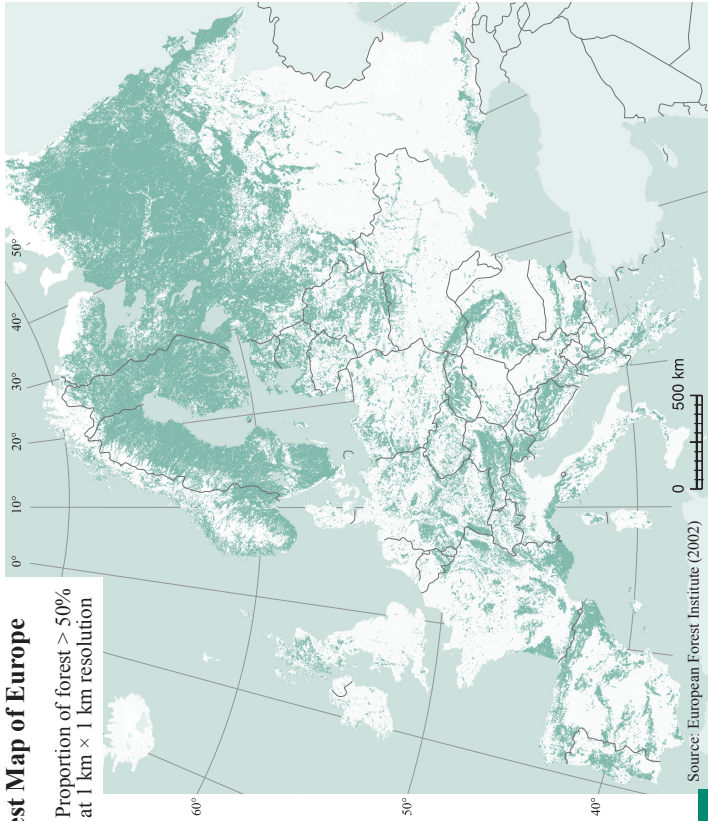
## Duration of the growing season in Europe

Average periods in days (1961–90) during which daily mean temperatures are above +5 °C



## Forest Map of Europe

■ Proportion of forest > 50%  
at 1 km × 1 km resolution



Source: European Forest Institute (2002)

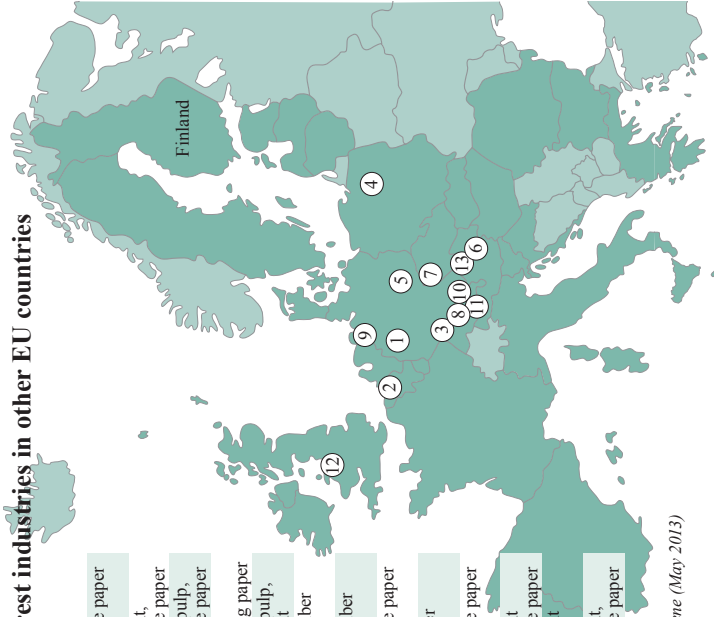
## Some major Finnish-owned forest industries in other EU countries

(excl. Sweden)

1. <i>Stora Enso Kabel</i> , Germany (Stora Enso)	magazine paper
2. <i>Stora Enso Langerbrugge</i> , Belgium (Stora Enso)	newsprint, magazine paper
3. <i>Stora Enso Maxau</i> , Germany (Stora Enso)	deinked pulp, magazine paper
4. <i>Stora Enso Ostroleka</i> , Poland (Stora Enso)	board, packaging paper
5. <i>Stora Enso Sachsen</i> , Germany (Stora Enso)	deinked pulp, newsprint
6. <i>Stora Enso Wood Products</i> , Austria (Stora Enso)	sawn timber
7. <i>Stora Enso Wood Products</i> , Czech Republic (Stora Enso)	sawn timber
8. <i>UPM Augsburg</i> , Germany (UPM-Kymmene)	magazine paper
9. <i>UPM Nordland Papier</i> , Germany (UPM-Kymmene)	fine paper
10. <i>MD Plattling</i> , Germany (UPM-Kymmene)	magazine paper
11. <i>UPM Schongau</i> , Germany (UPM-Kymmene)	newsprint magazine paper
12. <i>UPM Shotton Paper</i> , Great Britain (UPM-Kymmene)	newsprint
13. <i>UPM Steyerermühl</i> , Austria (UPM-Kymmene)	newsprint, magazine paper

Stora Enso is a Finnish-Swedish company.

Sources: *Websites of Stora Enso and UPM-Kymmene (May 2013)*



## Finnish exports of forest-industry products to the European Union, 2012

	Sawn goods 1 000 m <sup>3</sup>	Plywood and veneer	Particle board	Fibre board	Wood pulp	Paper and paperboard 1 000 m.t.
Austria	88	14	-	-	42	56
Belgium	113	13	-	0	38	664
Bulgaria	1	0	0	-	-	12
Cyprus	11	0	-	-	-	8
Czech Republic	5	5	-	-	1	17
Denmark	105	44	0	2	0	87
Estonia	117	3	11	1	15	58
France	570	56	-	0	108	273
Germany	457	183	0	0	515	1 975
Greece	24	1	-	-	22	60
Hungary	13	8	0	-	-	64
Ireland	14	0	-	-	0	25
Italy	120	41	-	0	215	205
Latvia	13	1	0	-	0	24
Lithuania	10	7	0	0	23	33
Luxembourg	0	0	-	-	-	4
Malta	-	-	-	-	-	1
Netherlands	216	107	-	1	112	141
Poland	43	21	0	-	76	446
Portugal	9	1	-	-	44	8
Romania	0	0	-	-	11	16
Slovakia	5	1	-	-	17	15
Slovenia	0	0	-	-	2	2
Spain	67	18	-	-	94	534
Sweden	32	79	9	16	133	295
United Kingdom	662	150	0	16	92	1 129
<b>EU, total</b>	<b>2 695</b>	<b>750</b>	<b>21</b>	<b>36</b>	<b>1 560</b>	<b>6 151</b>
% of total exports	42	83	81	88	54	60

Source: National Board of Customs

## FINNISH FORESTRY AND FOREST INDUSTRY

### National economy, forestry and the forest industry

In order to achieve economic growth in post-war Finland, major investment was made in the pulp and paper industry, leading to a doubling of production between 1955 and 1965. While growth has continued in the forest industry, there has also been substantial growth in the metal and engineering industries and, later, in the high-tech electronics industry.

In 1980, roundwood and forest-industry products represented 43% of the total value of goods exported from Finland; the corresponding figure in 2012 was 19%. The same diversification of production is also seen in the structure of the gross domestic product: in 1980, forestry accounted for 4.6% of GDP and primary forest-industry production for 6.7%, while in 2012 the respective figures were 1.7% and 2.4%. In employment, forestry accounted for 2.7% and the forest industry for 5.2% of the active workforce in 1980. In 2012, the corresponding figures were 0.9% and 1.7%.

Flourishing engineering and service industries have also developed around forestry and the forest industry. Strong mutual connections have contributed to the success of the sector. Finnish engineering and service industry companies are in a strong position globally, e.g. in the manufacture of timber harvesters and paper machines and in providing consultancy services.

### Forestry and the forest industry in the Finnish national economy, 2012

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#### Gross domestic product

at market prices	EUR 192.5 billion
at basic prices	EUR 165.5 billion
of which	
forestry	1.7 %
forest industry	2.4 %

#### Total employment

of which	2.48 million persons
forestry	0.9 %
forest industry	1.7 %

#### Total exports of goods

of which	EUR 56.9 billion
forestry	0.2 %
forest industry	19.3 %

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Source: Statistics Finland



Finland is among the major suppliers of forest-related products to the world market, particularly printing and writing papers, and one of the biggest importers of roundwood. In 2012, the total export value of Finnish forest-industry products amounted to EUR 11.0 billion. Germany and the United Kingdom are the foremost importers of Finnish forest-industry products, together accounting for 27% of the total.

## Forest industry: production and exports

### Production of Finnish forest industry, 2010–2012

Product	Unit 1 000	2010	2011	2012
Sawn goods	m <sup>3</sup>	9 473	9 750	9 350
Plywood	"	980	1 035	1 020
Particle board	"	220	170	100
Fibreboard	m.t.	57	60	60
Mechanical pulp	"	3 775	3 614	3 404
Chemical pulp	"	6 733	6 748	6 826
Pulp, total	"	10 508	10 362	10 230
Newsprint, magazine paper	"	4 685	4 705	} 6 616
Fine paper	"	2 781	2 618	
Kraft and other paper	"	1 462	1 280	1 321
Paper, total	"	8 929	8 602	7 936
Paperboard	"	2 830	2 726	2 758
Paper and paperboard	"	11 759	11 329	10 694

Source: Finnish Forest Industries Federation

## Finnish forest industry exports, 2010–2012

Product	Unit	2010	2011	2012
	1 000			
Sawn goods	m <sup>3</sup>	5 838	6 115	6 451
Plywood	"	834	863	855
Particle board	"	92	86	26
Fibreboard	m.t.	35	41	41
Mechanical pulp	"	165	125	228
Chemical pulp	"	1 994	2 350	2 387
Newsprint	"	180	223	225
Magazine paper	"	4 358	4 205	3 721
Fine paper	"	3 013	2 884	2 793
Kraft paper	"	377	355	335
Other paper	"	330	304	303
Paper, total	"	8 259	7 971	7 377
Paperboard	"	2 545	2 529	2 555
Converted paper products	"	349	333	300
Total paper and paperboard	"	11 153	10 833	10 232

Source: National  
Board of Customs

## Value of Finnish forest industry exports, 2012

Country	Wood-based			Paper, paper-	Total
	Sawn goods	panels, other wood products	Pulp	board, converted products	
Austria	19	10	18	40	87
Belgium	21	10	17	427	475
Bulgaria	0	0	-	9	9
Cyprus	2	1	-	5	8
Czech Republic	1	5	1	15	22
Denmark	26	27	0	76	129
Estonia	23	15	6	53	97
France	110	64	54	200	428
Germany	92	135	247	1 376	1 850
Greece	5	4	10	38	57
Hungary	3	3	-	49	55
Ireland	3	1	0	21	25
Italy	26	21	116	151	314
Latvia	3	1	0	24	28
Lithuania	2	5	10	23	40
Luxembourg	0	0	-	5	5
Malta	-	0	-	1	1
Netherlands	40	49	59	121	269
Poland	10	14	42	343	409
Portugal	2	1	20	6	29
Romania	0	2	5	11	18
Slovakia	1	2	8	11	22
Slovenia	0	1	1	2	4
Spain	13	15	53	332	413
Sweden	11	102	33	260	406
United Kingdom	139	89	49	818	1 095
EU total	552	576	748	4 417	6 293
Other Europe	33	166	71	961	1 231
<b>Europe total</b>	<b>585</b>	<b>742</b>	<b>819</b>	<b>5 378</b>	<b>7 524</b>
Asia	345	150	498	791	1 784
Africa	308	7	40	185	540
North America	1	19	5	563	588
Latin America	0	2	13	310	325
Oceania	4	3	0	184	191
<b>Grand total</b>	<b>1 243</b>	<b>924</b>	<b>1 375</b>	<b>7 411</b>	<b>10 953</b>

EUR mill.

Source: National Board of Customs

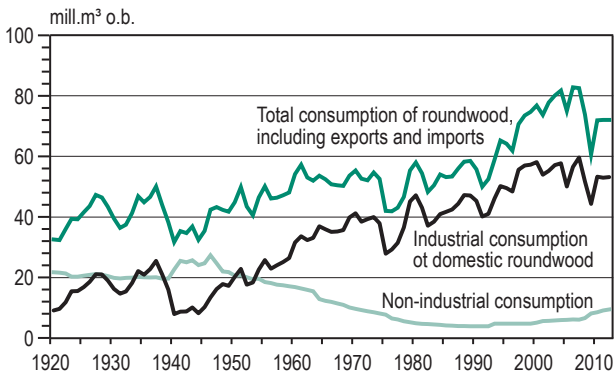
## Wood consumption

Despite a multiple increase in wood pulp production, total roundwood consumption in Finland remained at approximately the same level throughout the 30-year period from 1960. Many structural changes, such as reductions in fuelwood consumption and in roundwood exports, together with an increase in the use of industrial wood residues, contributed to rather modest increases in total wood consumption until the year 1993.

The years 1994 to 1996 were the first in which annual wood consumption exceeded 60 million m<sup>3</sup>, and since 1997 this has risen to more than 70 million m<sup>3</sup> (except in 2009). Industrial wood consumption has shown a continuous strong upward trend but it is now levelling off due to capacity cuts particularly in paper industries.

In 2012, total roundwood consumption reached 71.9 million m<sup>3</sup> (including imports and exports), of which industrial wood consumption accounted for 61.5 million m<sup>3</sup>. Imported roundwood (8.5 mill. m<sup>3</sup>) accounted for 14% of industrial wood consumption.

### Roundwood consumption in Finland, 1920–2012



*Non-industrial consumption does not include exports of roundwood.*

*Source: Finnish Forest Research Institute*

## Roundwood consumption during 5-year periods, 2000–2012

Consumption category	mill. m <sup>3</sup> o.b./yr		
	2000–04	2005–09	2010–12
Exports	0.8	1.1	1.1
Industrial roundwood	56.2	52.3	53.0
sawmills and wood-based panels	29.0	25.7	23.8
pulp industries	27.2	26.6	29.2
Fuelwood	5.5	6.5	8.9
Domestic roundwood total	62.5	59.9	63.0
Imported wood (industries)	15.3	15.0	8.9
<b>Total consumption</b>	<b>77.8</b>	<b>74.9</b>	<b>71.9</b>

*Note. In addition, pulp industries use wood residues which originate mainly from the sawmilling industry. See p. 23*

*Source: Finnish Forest Research Institute*

## Roundwood consumption and roundwood exports, 2010–2012

		mill. m <sup>3</sup> o.b.		
Consumption category		2010	2011	2012
<b>Total consumption in Finland</b>		<b>70.8</b>	<b>70.5</b>	<b>70.9</b>
	Pine	27.8	27.0	26.5
	Spruce	22.0	22.0	21.8
	Hardwood	15.1	15.0	15.9
	Unspecified	5.9	6.5	6.7
Domestic roundwood		61.5	61.7	62.4
	Pine	26.6	25.7	25.9
	Spruce	20.8	20.7	20.8
	Hardwood	11.1	11.7	11.7
	Unspecified (energy wood) <sup>1</sup>	3.0	3.6	4.0
Imported wood		9.3	8.8	8.5
	Pine	1.2	1.3	0.6
	Spruce	1.2	1.3	1.0
	Hardwood	4.0	3.3	4.2
	Unspecified (wood chips)	2.9	2.9	2.7
<b>Exports, incl. poles</b>		<b>0.9</b>	<b>1.2</b>	<b>1.0</b>
	Pine	0.8	0.9	0.8
	Spruce	0.1	0.2	0.2
	Hardwood	0.0	0.1	0.1

*Pine: Pinus  
sylvestris  
Spruce: Picea  
abies  
Hardwood: mainly  
Betula sp.*

*Source: Finnish  
Forest Research  
Institute*

<sup>1</sup> stemwood used in heating and power plants

## Wood consumption in sawmilling, plywood and pulp industries, 2010–2012

mill. m<sup>3</sup> o.b.

Year	Domestic roundwood Conif.	Hardwood	Imported wood	Sawmill chips	Total
Sawmilling					
2010	21.2	0.2	0.5	–	21.9
2011	20.8	0.1	0.4	–	21.3
2012	20.9	0.1	0.2	–	21.2
Plywood and veneer industry					
2010	1.5	0.8	0.1	–	2.3
2011	1.7	0.8	0.1	–	2.6
2012	1.7	0.8	0.1	–	2.6
Mechanical pulp industry					
2010	6.4	1.4	0.8	1.8	10.4
2011	5.9	1.4	1.0	1.6	10.0
2012	5.7	1.4	0.9	1.7	9.7
Chemical pulp industry					
2010	16.0	5.4	8.0	5.4	34.9
2011	15.7	6.0	7.3	5.7	34.7
2012	16.1	6.2	7.2	5.5	35.0

Source: Finnish  
Forest Research  
Institute

## Labour force

During the peak season for roundwood harvesting, i.e. the autumn-winter season from September to March, over 6 000 professional forest workers are fully employed in this work. The machinery used includes about 2 100 efficient, multi-function timber harvesters and 2 200 forwarders. During the other half of the year the labour and machinery inputs are about two thirds of those of the peak season. This seasonal variation in the demand for labour in forestry work is to an extent counterbalanced by the silvicultural work undertaken from May to September in particular. The annual labour input of non-industrial private forest owners is equivalent to about 4 000 man-years, of which about half relates to roundwood harvesting and half to silvicultural work.

In total, forestry employed 23 000 people in 2012, compared with 63 000 in 1980. This sharp contraction in employment occurred in the period up to 1996, after which employment in forestry has remained at about the same level. While mechanisation in roundwood harvesting has decreased the demand of labour, new areas of work have also emerged, for instance the harvesting and chipping of felling residues and small-sized trees for energy purposes. A similar downward trend in employment has also occurred in primary forest-industry production, which employed 120 000 people in 1980, but only 42 000 in 2012. Paper production which has decreased in recent years is, however, almost twice as much as in 1980.

### Employment in forestry and forest industry, 2010–2012

	1 000 persons		
	2010	2011	2012
Forestry	22	23	23
Forest industries	47	47	42
Forest sector, total	69	69	65
Employment, total	2 447	2 474	2 483
Unemployed, total	224	209	207
Unemployment rate, %	8.4	7.8	7.7

Source: Statistics  
Finland



## Employment in forest industry, 2010–2012

Branch of industry	1 000 persons		
	2010	2011	2012
Sawmilling	9	8	8
Wood-based panels	4	4	2
Other wood-products industry <sup>1</sup>	14	13	12
Pulp and paper industry	17	18	16
Converted paper products	3	4	3
<b>Forest industry, total</b>	<b>47</b>	<b>47</b>	<b>42</b>

Source: Statistics  
Finland

<sup>1</sup> including carpentry products and pre-fabricated wooden houses

Commercial roundwood removals in 2012 amounted to 51.5 million m<sup>3</sup> o.b., of which 77% came from non-industrial private forests. Removals have been at a high level since 1997 (except in 2009) but there has not been much increase since then. Instead, the growing need for industrial wood was met by imported roundwood. However, recently the situation has changed as forest industries have cut their production capacities. Domestic roundwood procurement, however, was not so much affected as roundwood imports dropped in 2009.

Harvesting in non-industrial private forests is mainly carried out by the forest industry or by its wood-procurement organisations. In 2012, the amount of harvesting carried out or organised by the forest owners themselves totalled 7.3 million m<sup>3</sup>, or 18% of the commercial roundwood removed from their forests.

Roundwood prices (excl. spruce logs) were falling in real terms between 1999 and spring 2006, after which they began to rise quickly. In summer 2007 the prices for coniferous logs were at their highest for 30 years. But the prices also came down quickly. For other types of roundwood the variation in prices was less marked. During the years the position of spruce logs has strengthened and that of birch logs weakened. The latter applies also to spruce pulpwood (see p. 28).

## Roundwood markets

## Roundwood procurement and consumption in Finland, 2012

Sources	mill. m <sup>3</sup> o.b.
Commercial roundwood	
from private-owned forests	39.7
from industry-owned forests	5.7
from state-owned forests	6.1
Other wood (mostly priv. for.) <sup>1</sup>	9.7
Domestic roundwood, total	61.2
Imported wood	10.0
<b>Roundwood procurement, total</b>	<b>71.2</b>
<b>Consumption</b>	
Sawmilling	21.2
Wood-based panels	2.6
Other wood-based products	0.2
Mechanical pulp industry	8.0
Chemical pulp industry	29.4
Industry, total	61.5
Household and other fuelwood <sup>1</sup>	9.3
Exports of roundwood	1.0
<b>Roundwood consumption, total</b>	<b>71.8</b>

*About 65% of imported wood comes from Russia. In addition, sawmills furnished the pulp industry with 7.2 mill. m<sup>3</sup> of wood chips and other residues.*

*Source: Finnish Forest Research Institute*

<sup>1</sup> including stemwood used in heating and power plants

## Roundwood removals by ownership category, 2010–2012

Ownership category	mill. m <sup>3</sup>		
	2010	2011	2012
Private forests <sup>1</sup>	40.7	41.0	39.7
Forest industries	5.2	5.4	5.7
State forests	6.1	6.0	6.1
Commercial removals, total	52.0	52.4	51.5
Other removals (mostly priv.) <sup>2</sup>	9.3	9.3	9.7
<b>Grand total</b>	<b>61.3</b>	<b>61.7</b>	<b>61.2</b>

Source: Finnish Forest Research Institute

<sup>1</sup> including municipalities and parishes

<sup>2</sup> mostly for energy use

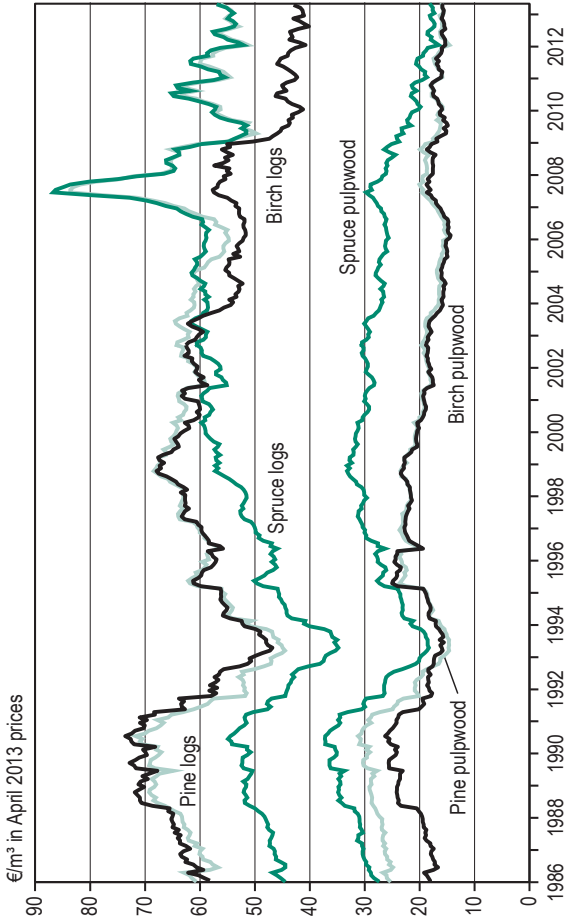
## Removals by roundwood type, 2010–2012

Roundwood type	mill. m <sup>3</sup>		
	2010	2011	2012
Sawlogs	21.6	21.8	21.4
pine logs	9.5	9.6	9.4
spruce logs	11.2	11.3	11.2
hardwood logs	0.9	1.0	0.9
Pulpwood	30.4	30.6	30.1
pine pulpwood	14.2	14.4	14.4
spruce pulpwood	8.4	8.3	8.0
hardwood pulpwood	7.8	8.0	7.6
Commercial removals, total	52.0	52.4	51.5
Other removals	9.3	9.3	9.7
<b>Grand total</b>	<b>61.3</b>	<b>61.7</b>	<b>61.2</b>

Source: Finnish Forest Research Institute

## Real stumpage prices in non-industrial private forestry, 1986–2013

Stumpage prices are unit prices paid for different kinds of standing (uncut) timber.



Source: Finnish Forest Research Institute

## Silvicultural and forest improvement work

Currently, about 110 000 hectares of Finnish forest land are planted or seeded annually for forestry after clear felling. The species chosen are almost exclusively native tree species. Seed-tree or shelterwood fellings conducted to encourage natural regeneration account for about 20 000 hectares annually.

Silvicultural measures are applied to about 230 000 hectares of seedling stands annually. About half of Finland's mires (wetlands) have been drained for forestry, but forest ditching has ceased and efforts are concentrated instead on cleaning existing ditches. Forest fertilizers are applied to some 50 000 hectares annually.

The total cost of silvicultural and forest improvement work was EUR 297 million in 2012. Some 70% of the EUR 213 million spent in non-industrial private forestry was accounted for by self-financing or own work input of the forest owners themselves, and the rest was financed through state grants. In addition, state subsidies were given for harvesting and chipping small-sized trees for energy purposes (EUR 23 mill.).

### Felling activities, 2010–2012

Type of felling	1 000 ha		
	2010	2011	2012
Thinnings	480	417	479
Clear fellings	145	109	122
Seed tree and shelterwood fellings	24	18	20
Removal of seed trees and shelterwood	53	40	49
Other fellings	27	15	17
<b>Total</b>	<b>729</b>	<b>600</b>	<b>688</b>
% of forest area	3.2	2.6	3.0

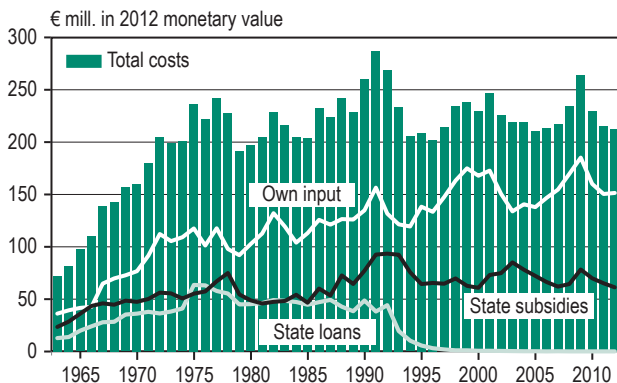
Source: Finnish Forest Research Institute

## Silvicultural and forest improvement work, 2010–2012

Type of work		2010	2011	2012
Clearing of regeneration areas	1 000 ha	49	47	49
Soil preparation	"	98	114	109
Artificial regeneration	"	109	100	108
Seedling stand improvement	"	230	235	219
Forest fertilization	"	45	49	32
Maintenance of drainage	"	59	58	52
Construction of forest roads	km	740	652	705
Improvement of forest roads	"	3 324	3 753	2 943
<b>Total costs</b>	<b>EUR mill.</b>	<b>289</b>	<b>300</b>	<b>297</b>

Source: Finnish Forest Research Institute

## Financing of silvicultural and forest improvement work in non-industrial, private forests, 1963–2012



Source: Finnish Forest Research Institute

Information on Finland's forest resources is collected through surveys carried out by the Finnish Forest Research Institute. Systematic ground sampling has been used. The periods during which the national forest inventory has been undertaken are as follows:

I	1921–24	V	1964–70	IX	1996–2003
II	1936–38	VI	1971–76	X	2004–2008
III	1951–53	VII	1977–84	XI	2009–2012
IV	1960–63	VIII	1986–94		

Despite the 13% reduction in Finland's forest area in the 1940s due to the territory lost in the Second World War, Finland's wood resources are currently more plentiful than in the pre-war years. According to the first national forest inventory, the total growing stock volume was 1 588 million m<sup>3</sup> over bark. The latest estimate is 2 332 million m<sup>3</sup> o.b. In recent years, the annual volume increment has exceeded the drain by about 30 million m<sup>3</sup> (see p. 39).

The structure of Finnish forests has changed significantly over the past 90 years. The forests now have a more even age structure. Scots pine accounts for 50% of the growing stock, Norway spruce for 30% and broad-leaved species (mostly birch) for 20%. This distribution has been a stable one but during the last 20 years the share of Norway spruce has been getting smaller. Scots pine is the dominant species on 64% of Finland's forest land area.

The area of productive forest land (i.e. land capable of yielding at least 1 m<sup>3</sup>/ha/yr) is 20.3 million hectares, and that of low productive forest land 2.5 million hectares. Thus, the total wood-growing area is 22.8 million hectares. The amount of this set aside for conservation purposes is 1.53 million hectares (6.7%). This land, on which all forestry activities are prohibited, lies almost entirely in the northern part of the country. According to the internationally defined concept of forest land, which sets a canopy cover of 10% as the threshold between forest land and other land, the forested land area is 22.1 million hectares.

The following tables are based on the 11th national forest inventory except the last one. Nature conservation areas are included.

## Principal land use categories in Finland, 2009–2012

	mill. ha
<b>Total area</b>	<b>33.8</b>
Inland watercourses	3.4
<b>Land area</b>	<b>30.4</b>
Arable land	2.7
Built-up areas	1.0
Transport routes	0.5
Forest land	20.3
Low productive forest land	2.5
Unproductive land <sup>1</sup>	3.2
Roads, depots	0.2
<b>Forestry land, total</b>	<b>26.2</b>
(of which nature conservation areas	2.8)

<sup>1</sup> treeless hills and mires

Source: Finnish Forest Research Institute

A site is recorded as mire if it is peat-covered or mire plants account for more than three quarters of the field layer flora. In transforming mires the effect of drainage is perceptible in the growing stock. Transformed mires have reached full post-drainage productivity.

Source: Finnish Forest Research Institute

## Mineral soils and mires and their drainage, 2009–2012

	mill. ha
Mineral soils	17.2
Mires	8.8
Roads, depots	0.2
<b>Forestry land, total</b>	<b>26.2</b>
Spruce mires	2.1
Pine mires	5.1
Treeless mires	1.5
<b>Total</b>	<b>8.8</b>
Undrained mires	4.1
Recently drained mires	0.2
Transforming mires	1.7
Transformed mires	2.8
<b>Total</b>	<b>8.8</b>



## Dominant tree species of forest stands, 2009–2012

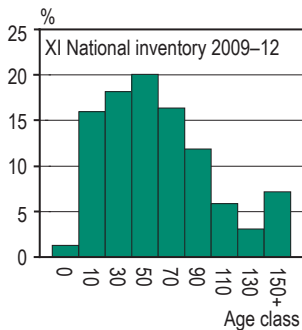
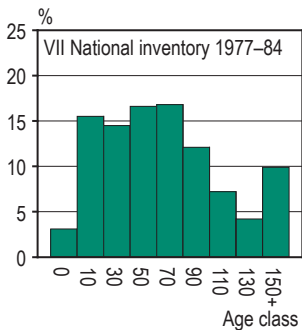
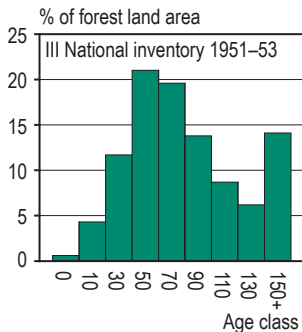
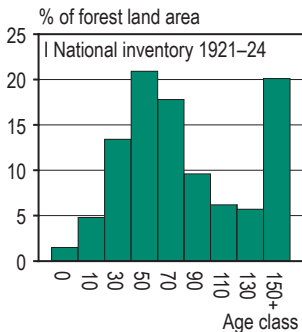
		% <sup>1</sup>	
Temporarily non-stocked		1.3	
Scots pine	<i>Pinus sylvestris</i>	63.9	
Norway spruce	<i>Picea abies</i>	24.8	<sup>1</sup> on forest land area
Other conifers		0.1	
Silver birch	<i>Betula pendula</i>	2.8	
Downy birch	<i>Betula pubescens</i>	6.3	Note that of volume, share of the broad-leaved species is much greater.
Aspen	<i>Populus tremula</i>	0.4	
Alder	<i>Alnus sp.</i>	0.4	
Other broadleaves		0.1	
Total		100.0	Source: Finnish Forest Research Institute
Forest land area	(mill. ha)	20.3	

## Forest resources in Finland, 2009–2012

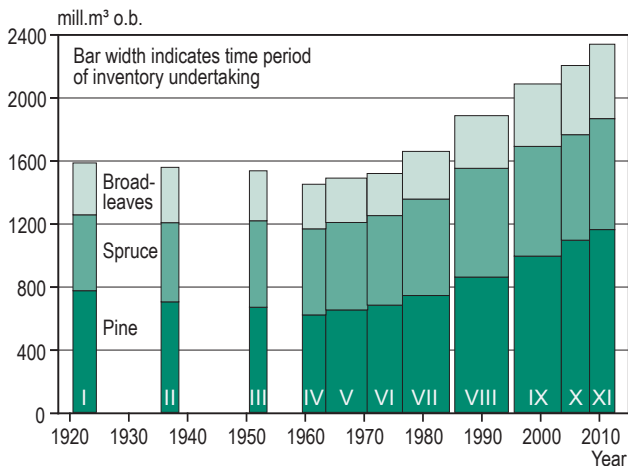
Forest and low prod. for. land	mill. ha	22.8
Growing stock volume	mill. m <sup>3</sup>	2 332
Scots pine	"	1 157
Norway spruce	"	703
Birch	"	391
Other broadleaves	"	82
Volume increment	mill.m <sup>3</sup> /year	104.3
Scots pine	"	47.3
Norway spruce	"	32.6
Birch	"	19.8
Other broadleaves	"	4.6

Source: Finnish Forest Research Institute

## Age structure development of the Finnish forests



## Growing stock volumes according to 11 national forest inventories



Note. Finland lost 13% of its forested area in 1944 due to the war.

Source: Finnish Forest Research Institute

## Forest ownership in Finland, 2009–2012

Ownership category	Forest land	Forestry land	%
	mill. ha	mill. ha	
Non-industrial private	12.4	14.0	53.3
Industrial private	1.7	1.9	7.4
State	5.1	9.0	34.4
Other public	1.1	1.3	5.0
<b>Total</b>	<b>20.3</b>	<b>26.2</b>	<b>100.0</b>

Source: Finnish Forest Research Institute

## Non-industrial, private ownership of forests, 2009

%

Ownership group	Of holdings/ owners	Of forest land area
Family ownership	76	75
Group ownership	12	14
Heirs ownership	12	11
Wage earners	30	26
Farmers	16	26
Other entrepreneurs	7	8
Pensioners	45	39
Others	2	2
Age < 40 years	6	8
Age 40–59 years	37	40
Age 60+ years	56	53
Reside on holding	42	52
Reside in the same municipality	22	19
Reside elsewhere	36	29
Rural place of residence	55	64
Semi-urban place of residence	19	15
Urban place of residence	26	21

*The figures apply to forest holdings with 5+ ha of forest land, of which there are about 320 000, and their corresponding forest land area is 12.0 million ha.*

*Source: Finnish Forest Research Institute*

## Growing stock volume by ownership category, 2009–2012

Ownership category	Scots pine	Norway spruce	Broad-leaves	mill. m <sup>3</sup> o.b.	
				Total	%
Non-industrial private	677	508	329	<b>1 514</b>	64.9
Industrial private	117	57	36	<b>210</b>	9.0
State	295	103	79	<b>477</b>	20.5
Other public	69	35	27	<b>131</b>	5.6
<b>Total</b>	<b>1 157</b>	<b>703</b>	<b>472</b>	<b>2 332</b>	<b>100.0</b>

Source: Finnish Forest Research Institute

## Annual volume increment by ownership category, 2009–2012

Ownership category	Scots pine	Norway spruce	Broad-leaves	mill. m <sup>3</sup> o.b./yr	
				Total	%
Non-industrial private	28.4	24.6	17.9	<b>70.9</b>	68.0
Industrial private	5.5	3.1	1.9	<b>10.5</b>	10.1
State	10.6	3.4	3.2	<b>17.2</b>	16.5
Other public	2.8	1.5	1.4	<b>5.7</b>	5.5
<b>Total</b>	<b>47.3</b>	<b>32.6</b>	<b>24.4</b>	<b>104.3</b>	<b>100.0</b>

Source: Finnish Forest Research Institute

The data refer to stands on forest land. State forests are located mainly in northern Finland where the climate is less favourable.

Source: Finnish Forest Research Institute

## Mean growing stock volume and annual increment by ownership category, 2009–2012

Ownership category	Mean volume	Increment	Increment
	m <sup>3</sup> /ha	m <sup>3</sup> /ha/yr	%
Non-industrial private	120	5.6	4.7
Industrial private	121	6.1	5.0
State	87	3.1	3.6
Other public	118	5.2	4.4
<b>Total</b>	<b>112</b>	<b>5.1</b>	<b>4.5</b>

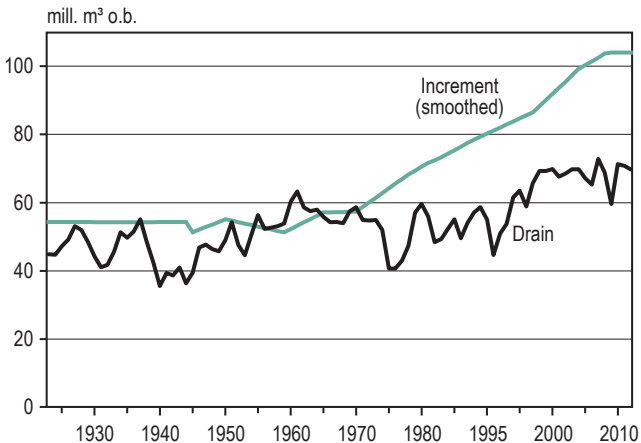
## Increment (I) and drain (D) in 5-year periods

		mill. m <sup>3</sup> o.b./yr		
		2000–04	2005–09	2010–12
Scots pine	I	46.1	47.4	47.3
	D	27.8	27.3	28.2
Norway spruce	I	28.6	31.7	32.6
	D	28.5	24.4	23.2
Broadleaves	I	21.7	23.6	24.4
	D	13.4	15.2	19.4
<b>Total</b>	<b>I</b>	<b>96.4</b>	<b>102.6</b>	<b>104.3</b>
	<b>D</b>	<b>69.7</b>	<b>66.8</b>	<b>70.8</b>

Drain refers to losses in growing stock due to fellings, silvicultural measures and natural mortality.

Source: Finnish Forest Research Institute

## Increment and drain of the growing stock, 1923–2012



Note. Finland lost 13% of its forested area in 1944 due to the war.

Source: Finnish Forest Research Institute

## Multiple production of forests, 2010–2012

Product	2010	2011	2012	
Commercial roundwood (ind.), mill. m <sup>3</sup> o.b.	52	52	52	
Other roundwood (energy), mill. m <sup>3</sup> o.b.	9	10	10	<sup>1</sup> for energy production
Harvested logging residues <sup>1</sup> , mill. m <sup>3</sup> o.b.	3	3	4	
Commercial forest berries, t <sup>2</sup>	9 097	11 797	15 651	<sup>2</sup> purchased by enterprises
Commercial forest mushrooms, t <sup>2</sup>	855	693	226	
Lichen picked for exporting, t	194	173	186	
Deer venison, t	10 351	8 913	6 364	Sources: Finnish Forest Research Institute,
Hare venison, t	501	500	442	Finnish Game and Fisheries Research Institute
Forest game birds, t	204	348	216	
Fur-bearing animals, 1000 indiv.	331	324	276	
Reindeer meat production, t	2 400	2 400	2 000	

## Forest condition in Finland, 2004–2008

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Forest land area, total 20.1 mill. ha

<b>Extent of damage affecting stand quality</b>	<b>% forest land</b>
Totally damaged	0.2
Severely damaged	4.2
Moderately damaged	23.9
<b>Total</b>	<b>28.3</b>
<b>Damage agents</b>	
Natural competition	0.7
Abiotic factors	8.4
Human interference	1.1
Moose	3.2
Insects	0.4
Fungi	5.3
Unidentified	9.3
<b>Total</b>	<b>28.3</b>

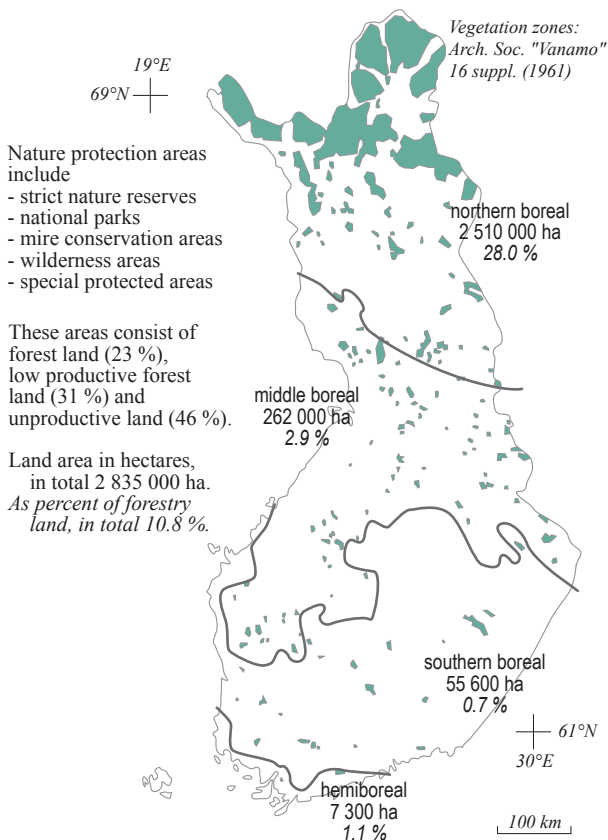
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*In two-storeyed stands only damage affecting the dominant storey is taken into account.*

*Source: Finnish Forest Research Institute*



## Nature protection areas by vegetation zone



Source: Finnish Environment Institute (2013)

## KEY CONTACTS IN FINNISH FOREST RESEARCH

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(Maa- ja elintarviketalouden tutkimuskeskus MTT)  
Humppilantie 14, FI-31600 Jokioinen  
Tel. +358 29 5300 700, fax +358 20 772 040  
Website: [www.mtt.fi](http://www.mtt.fi)

## **Pellervo Economic Research PTT**

(Pellervon taloustutkimus PTT)

Eerikinkatu 28 A, FI-00180 Helsinki

Tel. +358 9 348 8844, fax +358 9 3488 8500

Website: [www.ptt.fi](http://www.ptt.fi)

(Agricultural and forestry economics; PTT is backed by the Finnish cooperative movement)

## **TTS Institute**

(TTS-Työteho-seura)

Kiljavantie 6, FI-05200 Rajamäki

Tel. +358 9 2904 1200, fax +358 9 5129 0720

Website: [www.tts.fi](http://www.tts.fi)

(Small-scale forestry, Forest work)

## **University of Helsinki**

(Helsingin yliopisto)

Faculty of Agriculture and Forestry

Department of Forest Sciences

Latokartanonkaari 7, FI-00710 Helsinki

Tel. +358 9 191 58113, fax +358 9 1915 8100

Website: [www.helsinki.fi/forestsciences/](http://www.helsinki.fi/forestsciences/)

## **Viikki Campus Library of Helsinki University**

(Viikin kampuskirjasto)

Viikinkaari 11 A, FI-00710 Helsinki

Tel. +358 9 1915 8040

Website: [www.helsinki.fi/library/](http://www.helsinki.fi/library/)

## **University of Eastern Finland**

(Itä-Suomen yliopisto)

School of Forest Sciences

Yliopistokatu 7, FI-80100 Joensuu

Tel. +358 294 45 1111, fax +358 294 457 316

Website: [www.uef.fi/metsa](http://www.uef.fi/metsa)

## **VTT Technical Research Centre of Finland**

Tekniikantie 4 A, FI-02150 Espoo

Tel. +358 20 722 111, fax +358 20 722 7001

Website: [www.vtt.fi](http://www.vtt.fi)

(Forest industry, VTT operates as a R&D partner)

## Other useful contacts

### Ministry of Agriculture and Forestry

(Maa- ja metsätalousministeriö)  
Hallituskatu 3 A, FI-00170 Helsinki  
Tel. +358 295 16001, fax +358 9 16054 202  
Website: [www.mmm.fi](http://www.mmm.fi)

### Ministry of Employment and the Economy

(Työ- ja elinkeinoministeriö)  
Aleksanterinkatu 4, FI-00170 Helsinki  
Tel. +358 29 506 0000, fax +358 9 1606 2166  
Website: [www.tem.fi](http://www.tem.fi)

### Ministry of the Environment

(Ympäristöministeriö)  
Kasarmikatu 25, FI-00130 Helsinki  
Tel. +358 20 610 100, fax +358 9 1603 9320  
Website: [www.ym.fi](http://www.ym.fi)

### Finnish Environment Institute

(Suomen ympäristökeskus, SYKE)  
Mechelininkatu 34 a, FI-00260 Helsinki  
Tel. +358 20 610 123, fax +358 9 5490 2190  
Website: [www.syke.fi](http://www.syke.fi)  
(Governmental expert management of environment)

### Finnish Forest Association

(Suomen Metsäyhdistys)  
Salomonkatu 17 A, FI-00100 Helsinki  
Tel. +358 9 6850 880  
Website: [www.smy.fi](http://www.smy.fi)  
(Joint association for those related to forestry and forest industries)

### Finnish Forest Centre

(Suomen metsäkeskus)  
Aleksanterinkatu 18 A, FI-15140 Lahti  
Tel. 358 29 432 400  
Website: [www.metsakeskus.fi](http://www.metsakeskus.fi)  
(Government-funded organisation promoting sustainable forestry)

## **Finnish Forest Industries Federation**

(Metsäteollisuus ry)  
Snellmaninkatu13, FI-00170 Helsinki  
Tel. +358 9 132 61, fax +358 9 132 4445  
Website: [www.forestindustries.fi](http://www.forestindustries.fi)

## **Finnish Meteorological Institute**

(Ilmatieteen laitos)  
Erik Palmenin aukio 1, FI-00560 Helsinki  
Tel. +358 29 539 1000  
Website: [www.fmi.fi](http://www.fmi.fi)

## **Forestry Development Centre Tapio**

(Metsätalouden kehittämiskeskus Tapio)  
Pohjoinen Rautatiekatu 21 B, FI-00100 Helsinki  
Tel. +358 29 432 6000, fax +358 29 432 6001  
Website: [www.tapio.fi](http://www.tapio.fi)  
(Provides expertise particularly for private forestry)

## **Metsähallitus**

Vernissakatu 4, FI-01300 Vantaa  
Tel. +358 205 64 100  
Website: [www.metsa.fi](http://www.metsa.fi)  
(State-owned enterprise managing state forests)

## **MTK Forestry Group**

(MTK, Metsäryhmä)  
Simonkatu 6, FI-00100 Helsinki  
Tel. +358 20 4131, fax +358 20 413 2403  
Website: [www.mtk.fi](http://www.mtk.fi)  
(MTK is the Central Union of Agricultural Producers and Forest Owners)

## **Statistics Finland**

(Tilastokeskus)  
Työpajankatu 13, FI-00580 Helsinki  
Tel. +358 9 17 341  
Website: [www.stat.fi](http://www.stat.fi)

Source: *Finnish Forest Association*



Young spruce plant pushes up.