

Year	Number of plots				Total	I	II	III	IV	Total	
	I	II	III	IV							
1981	2,0	1,2	0,6	10,5	14,3	18,0	21,9	25,8	45,3	14,8	26,3
1982	1,7	0,2	1,0	18,5	21,4	18,3	26,0	33,7	79,4	19,3	38,6
1983	1,2	0,9	4,2	20,9	27,2	17,7	19,1	34,6	79,4	19,1	34,6
1984	1,5	6,1	4,6	24,2	36,4	18,3	18,3	21,9	62,9	18,3	34,6
1985	1,7	4,2	4,4	25,2	35,4	18,3	18,3	21,9	62,9	18,3	34,6
1986	1,8	4,1	9,1	31,0	55,9	18,3	18,3	21,9	62,9	18,3	34,6
1987	2,8	3,6	5,5	31,0	42,9	18,3	18,3	21,9	62,9	18,3	34,6
1988	2,4	3,3	4,6	22,4	32,7	18,3	18,3	21,9	62,9	18,3	34,6
1989	2,6	3,5	3,5	36,0	45,6	18,3	18,3	21,9	62,9	18,3	34,6
1990	4,0	5,4	7,7	54,1	71,2	18,3	18,3	21,9	62,9	18,3	34,6
1991	4,6	6,8	8,6	64,4	84,4	18,3	18,3	21,9	62,9	18,3	34,6
1992	5,2	6,4	11,7	76,2	99,5	18,3	18,3	21,9	62,9	18,3	34,6
1993	5,8	6,6	14,6	61,4	88,4	18,3	18,3	21,9	62,9	18,3	34,6
1994	6,3	7,1	10,0	58,3	81,4	18,3	18,3	21,9	62,9	18,3	34,6
1995	7,0	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
1996	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
1997	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
1998	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
1999	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2000	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2001	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2002	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2003	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2004	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2005	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2006	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2007	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2008	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6
2009	7,4	9,1	10,0	58,3	86,4	18,3	18,3	21,9	62,9	18,3	34,6



FOREST FINLAND

Finnish Forest Research Institute

IN BRIEF

METLA

2009

FOREST FINLAND IN BRIEF

Forest Finland in Brief 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 approximately 240 tables and 90 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. Finns look upon forests not only in the material sense, but also as a valuable ecological and cultural resource.

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 1.5 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.

Vantaa, August 2009

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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 m³ (u.b.) on a sustainable basis. Moreover, the infrastructure for roundwood procurement is good. The Finnish forest industry is highly export-oriented, and in most sectors of the industry, 70% to 90% of production goes abroad. Finland is a major exporter of sawn softwood and paper, particularly graphic papers.

Global roundwood production in 2007

(million m³ under bark):

Industrial wood	1 705	Softwood	1 318
Fuelwood & charcoal	1 886	Hardwood	2 273
	3 591		3 591

The total value of the global export trade of forest products amounted to USD 228 billion (f.o.b) in 2007, of which Finland's share was 7.0%. In the following tables, the Russian Federation is included in Europe.

World production of softwood, 2007

World	1 318	mill. m ³ u.b
Europe	498	
USA	282	
Canada	158	
China	142	
Russia	138	
Sweden	70	
Germany	64	
Brazil	54	
Finland	47	

World imports of roundwood and wood chips, 2007

World	179.9	mill. m ³ u.b
Europe	78.9	
China	42.6	
Japan	28.8	
Finland	15.6	
Austria	10.2	
Sweden	9.1	
Canada	8.6	
Korea Rep.	6.9	
Italy	6.6	

World production of sawn softwood, 2007

World	318.3	mill. m ³
Europe	131.3	
USA	58.8	
Canada	50.9	
Germany	24.0	
Russia	20.4	
Sweden	18.5	
Finland	12.4	
China	11.9	
Japan	11.4	
Austria	11.0	
India	9.9	

World exports of sawn softwood, 2007

World	110.1	mill. m ³
Europe	67.5	
Canada	32.4	
Russia	16.8	
Sweden	11.3	
Germany	8.7	
Austria	7.6	
Finland	7.1	
Chile	3.6	
Latvia	1.8	
New Zealand	1.8	
Romania	1.7	

World production of paper and paperboard, 2007

World	383.6	mill. tonnes
Europe	115.0	
USA	83.8	
China	78.0	
Japan	28.9	
Germany	23.2	
Canada	18.1	
Finland	14.3	
Sweden	11.9	
Korea Rep.	10.9	
Italy	10.1	
France	9.9	

World exports of paper and paperboard, 2007

World	118.7	mill. tonnes
Europe	70.0	
Canada	13.1	
Finland	13.1	
Germany	11.0	
USA	11.0	
Sweden	10.6	
China	7.3	
France	5.1	
Austria	4.3	
Indonesia	3.7	
Italy	3.5	

Source: FAO Yearbook. Forest Products 2007

Value of global exports of forest-industries' products, 2007

	USD billion	USD per capita
World	228.1	35
Europe	128.6	176
Canada	26.3	807
Germany	21.0	255
USA	20.9	70
Sweden	16.6	1 828
Finland	15.9	3 019
Russia	11.2	79
China	10.8	8

Source: FAO
Yearbook. Forest
Products 2007

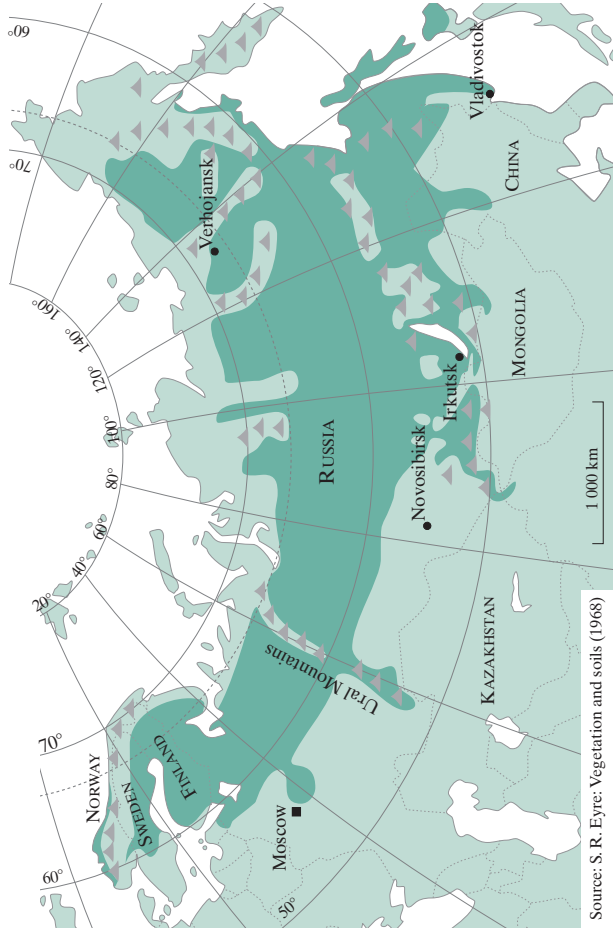
Eurasian boreal forest zone

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



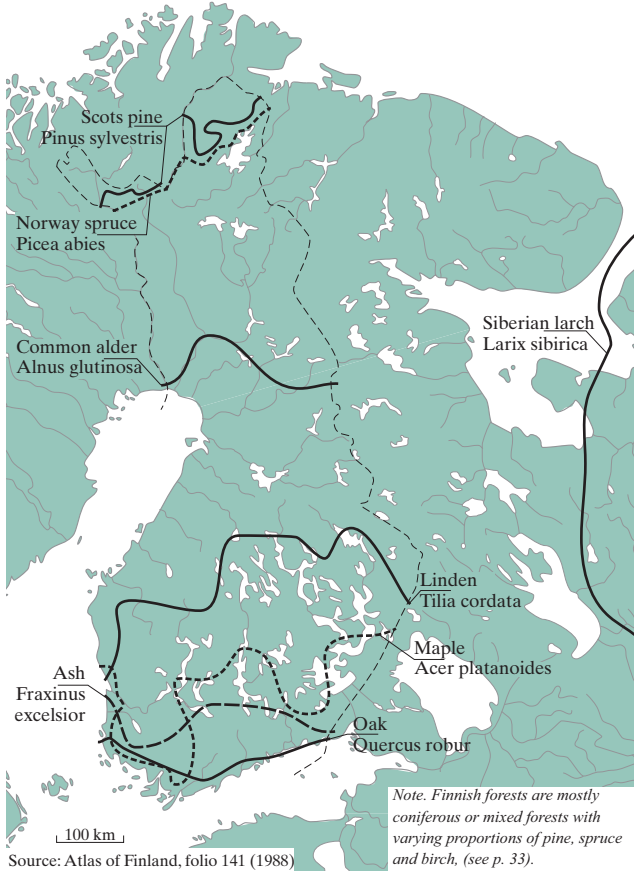
Source: S. R. Eyre: Vegetation and soils (1968)

Forest resources of the countries within the Eurasian boreal forest zone at the end of the 1990s

	Forests, total	Forests available for wood supply		
Forest land, mill. ha				
		% of land area		
Norway	8.7	28	6.6	
Sweden	27.3	67	21.2	
Finland	21.9	72	20.7	
Russia	816.5	50	525.2	
Total	874.4	50	573.7	
Growing stock on forest land, mill. m³ over bark				
	Conifers, %		Conifers, %	
Norway	771	77	671	80
Sweden	2 928	84	2 567	85
Finland	1 940	82	1 867	82
Russia	85 487	80	60 922	73
Total	91 126	80	66 027	74
Net annual increment on forest land, mill. m³ o.b.				
	Conifers, %		Conifers, %	
Norway	24.4	77	22.0	80
Sweden	94.1	83	85.4	84
Finland	73.7	78	72.5	78
Russia	969.0	71	742.0	63
Total	1 161.2	73	921.9	67
Removals in mid-1990s, mill. m³ o.b./yr				
	Conifers, %		Conifers, %	
Norway	10.9	89	10.9	89
Sweden	61.6	87	61.3	87
Finland	49.5	82	49.5	82
Russia	116.2	70	96.4	71
Total	238.2	78	218.1	79

Source: The
UN-ECE/FAO
Forest Resources
Assessment 2000

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 2006, 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 about 50% of Finland's sawnwood exports and over 60% of paper and paperboard exports. A strong focus on customers and markets has also led to considerable Finnish investment in forest-product manufacturing in Europe. 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

Country	Forest area mill. ha	Growing stock mill. m ³	of which conif., %	Increment Removals in mid-1990s	
				mill. m ³ /yr	mill. m ³ /yr
Austria	3.4	1 037	82	27.3	16.9
Belgium	0.6	140	46	5.1	4.4
Bulgaria	3.1	401	41	10.2	3.9
Cyprus	0.0	3	100	0.0	0.0
Czech Republic	2.6	668	84	20.4	13.0
Denmark	0.4	54	58	3.2	2.2
Estonia	1.9	307	63	7.1	4.5
Finland	20.7	1 867	82	72.5	49.5
France	14.5	2 836	36	92.3	47.6
Germany	10.1	2 820	69	89.0	38.9
Greece	3.1	140	56	3.5	2.4
Hungary	1.7	295	15	9.9	5.2
Ireland	0.6	43	92	3.5	2.3
Italy	6.0	877	33	18.7	8.4
Latvia	2.4	409	59	11.1	5.5
Lithuania	1.7	314	59	8.5	4.5
Luxembourg	0.1	20	18	0.7	0.4
Malta	0.0	0	..	0.0	0.0
Netherlands	0.3	52	56	2.2	1.2
Poland	8.3	1 771	79	39.4	25.3
Portugal	1.9	188	75	12.9	11.0
Romania	5.6	1 341	39	31.9	13.6
Slovakia	1.7	446	48	12.3	5.4
Slovenia	1.0	292	50	6.1	2.3
Spain	10.5	487	59	28.6	13.5
Sweden	21.2	2 567	85	85.4	61.3
United Kingdom	2.1	293	64	14.6	8.2
EU total	125.5	19 668	63	616.4	351.4

Source: The UN-ECE/FAO Forest Resources Assessment 2000

Duration of the growing season in Europe

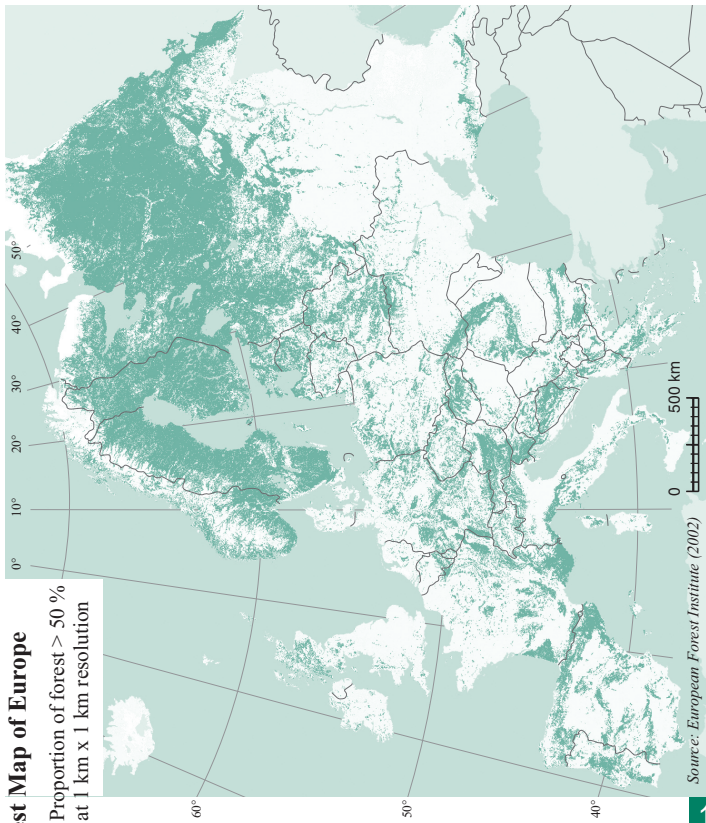
Average periods in days (1961–90) during which daily mean temperatures are above +5 °C



Source: Finnish Meteorological Institute

Forest Map of Europe

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



Source: European Forest Institute (2002)

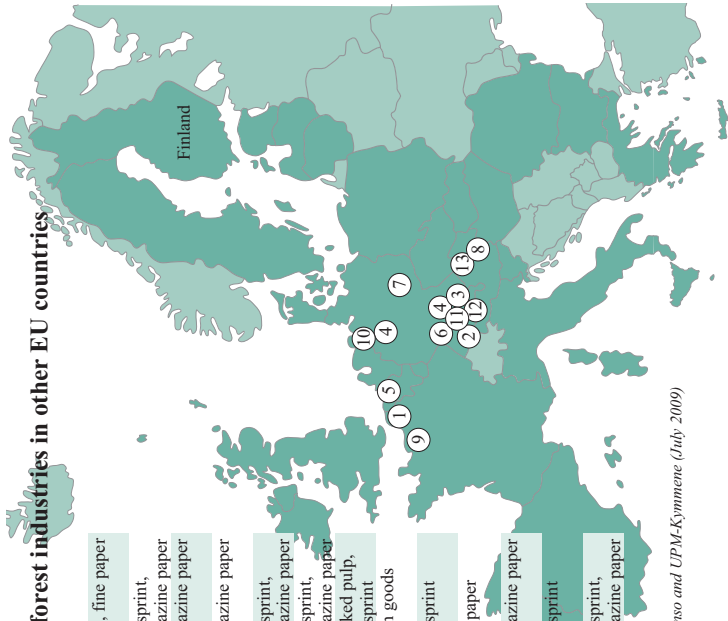
Some major Finnish-owned forest industries in other EU countries

(excl. Sweden)

1. <i>M-real Alizay</i> , France (M-real)	pulp, fine paper
2. <i>Lang Papier</i> , Germany (Myllykoski)	newsprint, magazine paper
3. <i>MD Plattling</i> , Germany (Myllykoski)	magazine paper
4. <i>Stora Enso Kabel</i> , Germany (Stora Enso)	magazine paper
5. <i>Stora Enso Langerbrugge</i> , Belgium (Stora Enso)	newsprint, magazine paper
6. <i>Stora Enso Maxau</i> , Germany (Stora Enso)	newsprint, magazine paper
7. <i>Stora Enso Sachsen</i> , Germany (Stora Enso)	deinked pulp, newsprint
8. <i>Stora Enso Timber</i> , Austria (Stora Enso)	sawn goods
9. <i>Chapelle Darblay</i> , France (UPM-Kymmene)	newsprint
10. <i>UPM Nordland Papier</i> , Germany (UPM-Kymmene)	fine paper
11. <i>UPM Augsburg</i> , Germany (UPM-Kymmene)	magazine paper
12. <i>UPM Schongau</i> , Germany (UPM-Kymmene)	newsprint
13. <i>UPM Steyermühl</i> , Austria (UPM-Kymmene)	newsprint, magazine paper

Stora Enso is a Finnish-Swedish company.

Source: Websites of M-real, Myllykoski, Stora Enso and UPM-Kymmene (July 2009)



Finnish exports of forest-industry products to the European Union, 2008

	Sawn goods	Plywood and veneer	Particle board	Fibre board	Wood pulp	Paper and paperboard
	1 000 m ³			1 000 m.t.		
Austria	49	19	0	–	37	63
Belgium	98	21	–	1	24	720
Bulgaria	0	0	0	–	–	16
Cyprus	21	1	–	0	–	4
Czech Republic	5	4	–	0	4	49
Denmark	179	81	3	2	0	131
Estonia	45	3	8	1	2	69
France	596	78	0	0	149	468
Germany	361	180	–	0	791	2 549
Greece	99	1	0	0	18	149
Hungary	21	5	0	–	0	91
Ireland	56	3	0	0	0	31
Italy	191	35	–	0	112	244
Latvia	2	0	0	0	0	28
Lithuania	6	3	1	–	13	48
Luxembourg	0	0	–	–	–	5
Malta	–	–	–	0	–	0
Netherlands	285	174	–	1	113	233
Poland	46	22	1	–	61	404
Portugal	6	4	–	–	3	20
Romania	1	2	–	–	–	15
Slovakia	6	4	–	–	0	21
Slovenia	1	0	–	–	1	15
Spain	102	35	–	–	54	846
Sweden	29	91	22	9	158	272
United Kingdom	892	198	10	19	134	1 375
EU, total	3 097	966	45	34	1 674	7 866
% of total exports	52	84	51	83	70	64

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. However, production reductions in forest industry in 2008 are forecast to indicate long-lasting downturn particularly in pulp and paper.

In 1980, roundwood and forest-industry products represented 43% of the total value of goods exported from Finland; the corresponding figure in 2008 was 18%. 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 2008 the respective figures were 2.2% and 2.9%. In employment, forestry accounted for 2.7% and the forest industry for 5.2% in 1980. In 2008, the corresponding figures were 0.9% and 2.3%.

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, 2008

Gross domestic product

at market prices		EUR 184.7 billion
at basic prices		EUR 161.5 billion
of which	forestry	2.2 %
	forest industry	2.9 %

Total employment

		2.53 million persons
of which	forestry	0.9 %
	forest industry	2.3 %

Total exports of goods

		EUR 65.6 billion
of which	forestry	0.2 %
	forest industry	17.4 %

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 2008, the total export value of Finnish forest-industry products amounted to EUR 11.4 billion. Germany and the United Kingdom are the foremost importers of Finnish forest-industry products, together accounting for 29% of the total.

Forest industry: production and exports

Production of Finnish forest industry, 2006–2008

Product	Unit 1 000	2006	2007	2008
Sawn goods	m ³	12 227	12 477	9 870
Plywood	"	1 415	1 410	1 265
Particle board	"	440	400	250
Fibreboard	m.t.	83	75	66
Mechanical pulp	"	5 169	5 157	4 465
Chemical pulp	"	7 946	7 699	7 159
Pulp, total	"	13 115	12 856	11 624
Newsprint, magazine paper	"	6 699	6 776	5 894
Fine paper	"	3 045	2 992	2 940
Kraft and other paper	"	1 429	1 504	1 394
Paper, total	"	11 172	11 272	10 229
Paperboard	"	2 967	3 063	2 897
Paper and paper-board	"	14 140	14 335	13 126

Source: Finnish Forest Industries Federation

Finnish forest industry exports, 2006–2008

Product	Unit 1 000	2006	2007	2008
Sawn goods	m ³	7 728	7 081	5 992
Plywood	"	1 250	1 240	1 083
Particle board	"	224	183	88
Fibreboard	m.t.	55	47	41
Mechanical pulp	"	233	196	135
Chemical pulp	"	2 528	2 355	2 090
Newsprint	"	506	517	303
Magazine paper	"	5 862	5 961	5 286
Fine paper	"	3 258	3 264	3 048
Kraft paper	"	428	421	369
Other paper	"	346	352	291
Paper, total	"	10 401	10 515	9 297
Paperboard	"	2 552	2 641	2 599
Converted paper products	"	412	446	409
Total paper and paperboard	"	13 365	13 602	12 305

Source: National
Board of Customs

Value of Finnish forest industry exports, 2008

Country	EUR mill.				
	Sawn goods	Wood-based panels, other wood products	Pulp	Paper, paper-board, converted products	Total
Austria	11	22	17	46	96
Belgium	17	20	8	407	452
Bulgaria	0	1	–	12	13
Cyprus	4	2	–	3	9
Czech Republic	1	5	2	37	45
Denmark	45	60	0	109	214
Estonia	9	20	0	62	91
France	117	103	69	311	600
Germany	69	172	359	1 538	2 138
Greece	18	16	8	87	129
Hungary	5	4	0	67	76
Ireland	11	5	0	23	39
Italy	47	42	56	172	317
Latvia	1	5	0	27	33
Lithuania	2	5	7	37	51
Luxembourg	0	0	-	5	5
Malta	-	0	-	0	0
Netherlands	51	82	60	169	362
Poland	10	23	33	261	327
Portugal	1	5	1	13	20
Romania	0	2	–	11	13
Slovakia	2	6	0	14	22
Slovenia	0	3	0	13	16
Spain	20	35	28	476	559
Sweden	10	129	44	216	399
United Kingdom	177	129	67	828	1 201
EU total	628	896	759	4 943	7 226
Other Europe	38	243	78	958	1 317
Europe total	666	1 139	837	5 900	8 542
Asia	240	146	217	709	1 312
Africa	245	3	14	130	392
North America	1	46	2	584	633
Latin America	–	2	5	307	314
Oceania	2	4	–	188	194
Grand total	1 154	1 339	1 076	7 819	11 388

Source: National Board of Customs

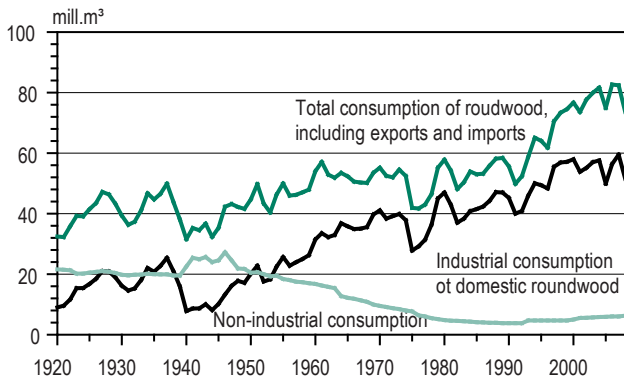
Wood consumption

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 m³, and since 1997 this has risen to more than 70 million m³. Industrial wood consumption has shown a continuous strong upward trend.

In 2008, total roundwood consumption reached 73.6 million m³ (including imports and exports), of which industrial wood consumption accounted for 66.3 million m³. Imported roundwood (14.7 mill. m³) accounted for 22% of industrial wood consumption.

Roundwood consumption in Finland, 1920–2008



Non-industrial consumption does not include exports of roundwood
Source: Finnish Forest Research Institute

Roundwood consumption during 5-year periods, 1995–2008

Consumption category	mill. m ³ /yr		
	1995–99	2000–04	2005–08
Exports	1.0	0.8	1.1
Industrial roundwood	53.4	56.2	54.3
sawmills and panel industr.	27.1	29.0	27.2
pulp industries	26.3	27.2	27.1
Fuelwood	4.6	5.5	6.0
Domestic roundwood total	59.0	62.5	61.4
Imported wood (industries)	9.8	15.3	17.0
Total consumption	68.8	77.8	78.4

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, 2006–2008

		mill. m ³		
Consumption category		2006	2007	2008
Total consumption in Finland		81.5	81.4	72.5
	Pine	29.3	32.0	28.1
	Spruce	29.6	28.6	24.4
	Hardwood	20.0	18.4	17.5
	Unspecified	2.5	2.4	2.6
	Domestic roundwood	62.4	65.4	57.8
	Pine	26.4	29.2	25.7
	Spruce	25.1	25.6	21.8
	Hardwood	10.8	10.6	10.4
	Imported wood	19.2	16.0	14.7
	Pine	2.9	2.7	2.4
	Spruce	4.5	3.0	2.6
	Hardwood	9.2	7.8	7.1
	Unspecified	2.5	2.4	2.6
	Exports, incl. poles	1.1	1.0	1.1
	Pine	0.9	0.8	0.9
	Spruce	0.1	0.0	0.1
	Hardwood	0.1	0.1	0.1

*Pine: Pinus
sylvestris*

*Spruce: Picea
abies*

*Hardwood: mainly
Betula sp*

*'Unspecified' con-
sists of imported
wood chips and
residues*

*Source: Finnish
Forest Research
Institute*

Wood consumption in sawmilling, plywood and pulp industries, 2006–2008

Year	Domestic roundwood		Imported wood	Sawmill chips	Total
	Conif.	Hardwood			
	mill. m ³				
	Sawmilling				
2006	24.4	0.2	2.8	–	27.3
2007	26.3	0.2	1.5	–	28.0
2008	21.0	0.2	0.9	–	22.1
	Plywood and veneer industry				
2006	1.9	0.9	1.3	–	4.1
2007	2.1	1.2	0.7	–	4.0
2008	1.9	0.8	0.8	–	3.5
	Mechanical pulp industry				
2006	7.4	1.3	2.4	3.1	14.2
2007	7.9	1.2	1.9	3.2	14.2
2008	7.3	1.2	1.5	2.6	12.6
	Chemical pulp industry				
2006	14.4	5.4	12.6	7.3	39.7
2007	15.2	5.1	11.7	7.5	39.5
2008	13.7	5.1	11.5	6.4	36.7

Source: Finnish Forest Research Institute

Labour force

During the peak season for roundwood harvesting, i.e. the winter season from October to March, over 6 000 professional forest workers are fully employed in this work. The machinery used includes about 1 900 efficient, multi-function timber harvesters and 2 000 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 over 4 000 man-years, of which about half relates to roundwood harvesting and half to silvicultural work.

In total, forestry employed 24 000 people in 2008, 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 58 000 in 2008. Paper production, however, has more than doubled during the same period.

Employment in forestry and forest industry, 2006–2008

	2006	2007	2008
	1 000 persons		
Forestry	23	24	24
Forest industry	67	63	58
Forest sector, total	90	87	82
Employment, total	2 443	2 492	2 531
Unemployed, total	204	183	172
Unemployment rate, %	7.7	6.8	6.4

Source: Statistics
Finland

Employment in forest industry, 2006–2008

Branch of industry	1 000 persons		
	2006	2007	2008
Sawmilling	10	9	10
Wood-based panels	6	6	6
Other wood-products industry ¹	16	17	15
Pulp and paper industry	30	27	23
Converted paper products	4	4	4
Forest industry, total	67	63	58

¹ Including carpentry products and pre-fabricated wooden houses

Source: Statistics Finland

Commercial roundwood removals in 2008 amounted to 51.7 million m³, of which 79% came from non-industrial private forests. Removals have been at a high level since 1997 but there has not been much increase since then. Instead, the growing need for industrial wood has been met by imported roundwood.

Harvesting in non-industrial private forests is mainly carried out by the forest industry or by its wood-procurement organisations. In 2008, the amount of harvesting carried out or organised by the forest owners themselves totalled 8.5 million m³, or 21% 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.

Roundwood markets

Roundwood procurement and consumption in Finland, 2008

Sources	mill. m ³
Commercial roundwood	
from private-owned forests	41.0
from industry-owned forests	5.3
from state-owned forests	5.3
Other wood (mostly priv. for.)	7.5
Domestic roundwood, total	59.1
Imported wood	20.3
Roundwood procurement, total	79.4
Consumption	
Sawmilling	22.1
Wood-based panels	3.6
Other wood-based products	0.4
Mechanical pulp industry	10.0
Chemical pulp industry	30.3
Industry, total	66.3
Household and other fuelwood	6.3
Exports of roundwood	1.1
Roundwood consumption, total	73.6

About 60% of imported wood comes from Russia. In addition, sawmills furnished the pulp industry with 9.6 mill. m³ of wood chips and other residues.

Source: Finnish Forest Research Institute

Roundwood removals by ownership category, 2006–2008

Ownership category	2006	2007	mill. m ³
			2008
Private forests ¹	39.4	46.4	41.0
Forests industries	6.4	6.2	5.3
State forests	5.0	5.2	5.3
Commercial removals, total	50.8	57.7	51.7
Other removals (mostly priv.)	7.0	6.9	7.5
Grand total	57.8	64.7	59.1

¹ including municipalities, parishes and some other public owners.

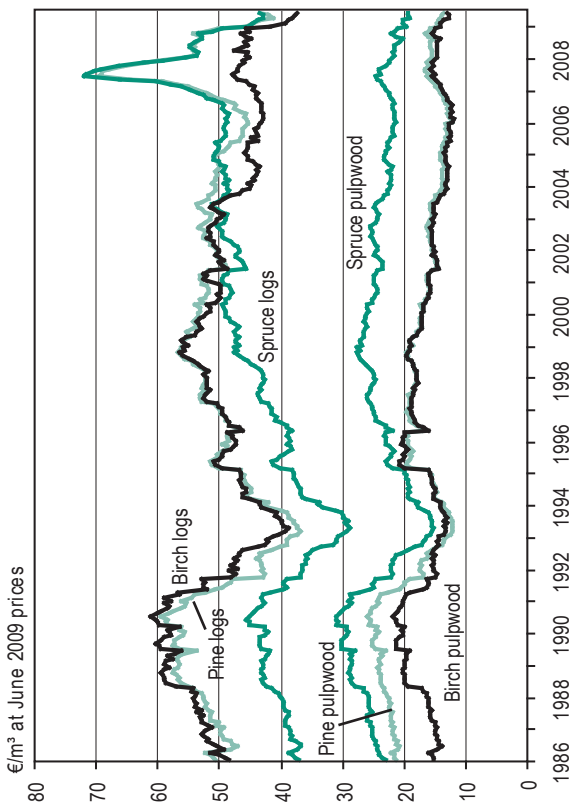
Source: Finnish Forest Research Institute

Removals by roundwood type, 2006–2008

Roundwood type	2006	2007	mill. m ³
			2008
Sawlogs	23.7	28.0	21.5
pine logs	10.2	12.3	9.8
spruce logs	12.6	14.5	10.5
hardwood logs	1.0	1.2	1.1
Pulpwood	27.1	29.7	30.2
pine pulpwood	12.2	13.7	14.6
spruce pulpwood	8.9	9.4	8.2
hardwood pulpwood	6.0	6.6	7.4
Commercial removals, total	50.8	57.7	51.7
Other removals	7.0	6.9	7.5
Grand total	57.8	64.7	59.1

Source: Finnish Forest Research Institute

Stumpage prices in non-industrial private forestry 1986–2009



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 120 000 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 30 000 hectares annually.

Silvicultural measures are applied to about 250 000 hectares of seedling stands annually. About half of Finland's mires (wetlands) have been drained for forestry, but nowadays forest ditching has ceased and efforts are concentrated instead on cleaning existing ditches. Forest fertilizers are applied to an increasing extent.

The total cost of silvicultural and forest improvement work was EUR 291 million in 2008. Some 70% of the EUR 203 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 small-sized trees for energy purposes (EUR 5 mill.).

Felling activities, 2006–2008

Type of felling	1 000 ha		
	2006	2007	2008
Thinnings	384	416	487
Clear fellings	145	174	108
Seed tree and shelterwood fellings	27	30	21
Removal of seed trees and shelterwood	53	58	46
Other fellings	10	10	11
Total	619	688	673
% of forest area	2.7	3.0	2.9

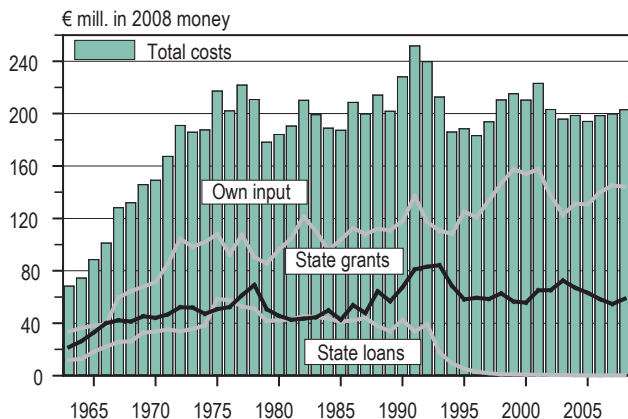
Source: Finnish Forest Research Institute

Silvicultural and forest improvement work, 2006–2008

Type of work		2006	2007	2008
Clearing of regeneration areas	1 000 ha	63	69	63
Soil preparation	"	123	131	136
Artificial regeneration	"	119	124	128
Seedling stand improvement	"	218	248	256
Forest fertilization	"	26	35	51
Maintenance of drainage	"	72	67	61
Construction of forest roads	km	793	852	826
Improvement of forest roads	"	2 467	3 218	3 573
Total costs	EUR mill.	235	266	291

Source: Finnish Forest Research Institute

Financing of silvicultural and forest-improvement works in non-industrial private forests 1963–2008



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		
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 m³. The latest estimate is 2 206 million m³. In recent years, the annual volume increment has exceeded the drain by about 30 million m³.

The structure of Finnish forests has changed significantly over the past 80 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 10 years the share of Norway spruce has been getting smaller. Scots pine is the dominant species on 65% of Finland's forest land area.

The area of productive forest land (i.e. land capable of yielding at least 1 m³/ha/yr) is 20.1 million hectares, and that of other wooded land 2.7 million hectares. Thus, the total wood-growing area is 22.8 million hectares. The amount of this set aside for conservation purposes is 1.52 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 10th national forest inventory. Nature conservation areas are included.

Principal land use categories in Finland, 2004–2008

	mill. ha
Total area	33.8
Inland watercourses	3.4
Land area	30.4
Agricultural land	2.7
Built-up areas	1.0
Transport routes	0.4
¹ Treeless hills and mires	Forest land 20.1
	Other wooded land 2.7
	Unproductive land ¹ 3.3
	Roads, depots 0.2
	Forestry land, total 26.3
	(of which nature conservation areas 2.8)

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, 2004–2008

	mill. ha
Mineral soils	17.2
Mires	8.9
Roads, depots	0.2
Forestry land, total	26.3
Spruce mires	2.2
Pine mires	5.1
Treeless mires	1.6
Total	8.9
Undrained mires	4.1
Recently drained mires	0.2
Transforming mires	2.4
Transformed mires	2.2
Total	8.9

Dominant tree species of forest stands, 2004–2008

		% ¹
Temporarily non-stocked		1.4
Scots pine	<i>Pinus sylvestris</i>	65.0
Norway spruce	<i>Picea abies</i>	23.9
Other conifers		0.1
Silver birch	<i>Betula pendula</i>	2.7
Downy birch	<i>Betula pubescens</i>	6.1
Aspen	<i>Populus tremula</i>	0.3
Alder	<i>Alnus sp.</i>	0.3
Other broadleaves		0.1
Total		100.0
Forest land area	(mill. ha)	20.1

¹ on forest land area

Note that of volume, share of the broad-leaved species is much greater.

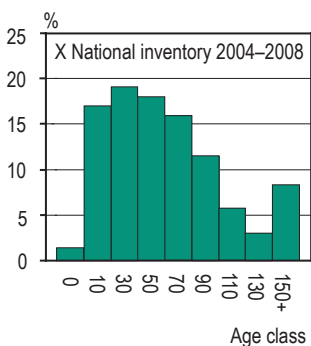
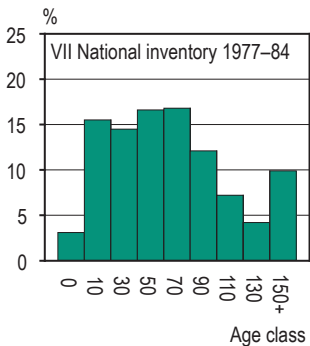
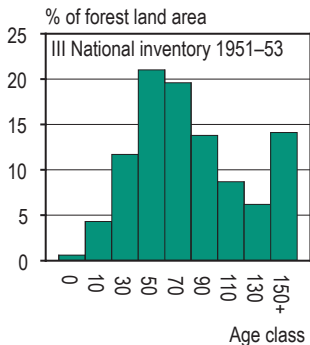
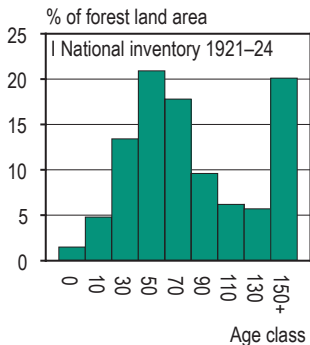
Source: Finnish Forest Research Institute

Timber resources in Finland, 2004–2008

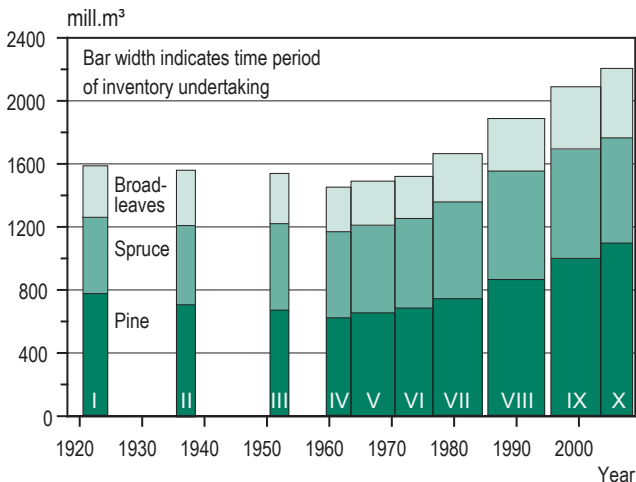
Forest and other wooded land	mill. ha	22.8
Growing stock volume	mill. m ³	2 206
Scots pine	"	1 098
Norway spruce	"	669
Birch	"	365
Other broadleaves	"	73
Volume increment	mill.m ³ /year	99.5
Scots pine	"	47.4
Norway spruce	"	29.8
Birch	"	18.3
Other broadleaves	"	4.1

Source: Finnish Forest Research Institute

Age structure development of the Finnish forests



Growing stock volumes according to ten 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, 2004–2008

Ownership category	Forest land	Forestry land	
	mill. ha	mill. ha	%
Non-industrial private	12.1	13.7	52.1
Industrial private	1.8	2.0	7.7
State	5.1	9.2	35.1
Other public	1.1	1.3	5.0
Total	20.1	26.3	100.0

Source: Finnish Forest Research Institute

Non-industrial, private ownership of forests, 1999

		%	
	Ownership group	Of holdings/ owners	Of forest land area
<i>The figures apply 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.</i>	Family ownership	75	76
	Group ownership	11	12
	Heirs ownership	14	12
	Farmers	22	33
	Other entrepreneurs	6	6
	Wage earners	30	25
	Pensioners	37	32
	Others	5	4
	Age < 40 years	11	13
	Age 40–59 years	45	47
	Age 60+ years	44	40
	Reside on holding	50	60
	Reside in the same municipality	17	15
	Reside elsewhere	33	25

Source: Finnish
Forest Research
Institute

Growing stock volume by ownership category, 2004–2008

Ownership category	Scots pine	Norway spruce	Broad-leaves	mill. m ³	
				Total	%
Non-indust. private	632	484	305	1 421	64.4
Industrial private	119	52	35	206	9.3
State	284	97	73	454	20.6
Other public	63	36	26	125	5.7
Total	1 098	669	439	2 206	100.0

Source: Finnish Forest Research Institute

Annual volume increment by ownership category, 2004–2008

Ownership category	Scots pine	Norway spruce	Broad-leaves	mill. m ³ /yr	
				Total	%
Non-indust. private	28.0	22.5	16.4	66.9	67.2
Industrial private	5.9	2.7	1.8	10.3	10.4
State	10.8	3.1	2.9	16.7	16.8
Other public	2.7	1.5	1.3	5.5	5.6
Total	47.4	29.8	22.4	99.5	100.0

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, 2004–2008

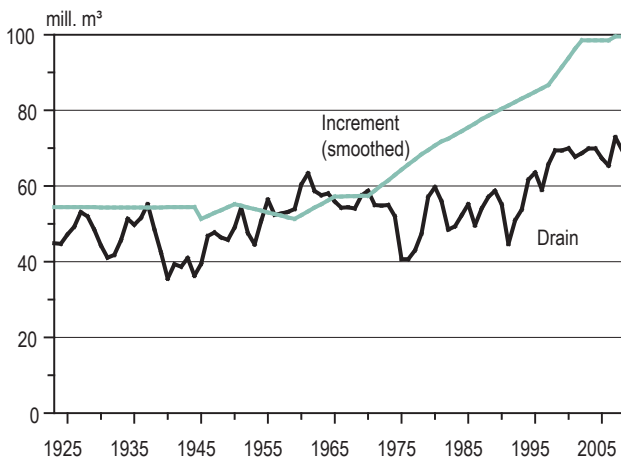
Ownership category	Mean volume m ³ /ha	Increment m ³ /ha/yr	Increment %
Non-industrial private	116	5.5	4.7
Industrial private	113	5.7	5.0
State	81	3.1	3.8
Other public	114	5.1	4.5
Total	107	4.9	4.6

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

Increments for 2005–08 are forecasts. Drain refers to losses in growing stock due to fellings, silvicultural measures and natural mortality.
Source: Finnish Forest Research Institute

			mill. m ³ /yr		
			1995–99	2000–04	2005–08
Scots pine	I		39.8	46.1	47.4
	D		25.1	27.8	28.5
Norway spruce	I		27.5	28.6	29.8
	D		27.8	28.5	25.7
Broadleaves	I		20.1	21.7	22.4
	D		12.5	13.4	14.7
Total	I		87.4	96.4	99.5
	D		65.4	69.7	69.0

Increment and drain of the growing stock, 1923–2008



Source: Finnish Forest Research Institute

Multiple production of forests, 2006–2008

Product		2006	2007	2008	
Commercial roundwood	mill. m ³ o.b.	51	58	52	¹ for energy production
Other roundwood	mill. m ³ o.b.	7	7	7	
Harvested logging residues ¹	mill. m ³ o.b.	2	2	3	
Commercial forest berries	t ²	6 065	11 298	5 986	² Quantities offered for sale, in tonnes.
Commercial forest mushrooms	t ²	447	353	492	
Lichen picked for exporting	t	221	237	197	Sources: Finnish Forest Research Institute, Finnish Game and Fisheries Research Institute
Deer venison	t	11 104	9 459	8 825	
Hare venison	t	525	537	556	
Forest game birds	t	308	235	148	
Fur-bearing animals	1000 indiv.	290	299	319	
Reindeer meat production	t	2 800	2 700	2 400	

Forest condition in Finland, 2004–2008

Forest land area, total 20.1 mill. ha

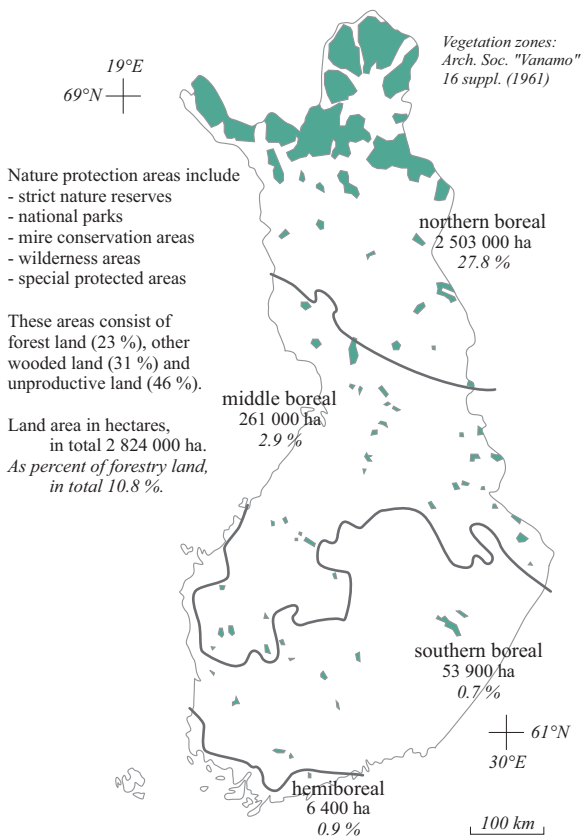
Extent of damage affecting stand quality	% forest land
Totally damaged	0.2
Severely damaged	4.2
Moderately damaged	23.9
Total	28.3

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

Source: Finnish Forest Research Institute

Damage agents	
Natural competition	0.7
Abiotic factors	8.4
Human interference	1.1
Moose	3.2
Insects	0.4
Fungi	5.3
Unidentified	9.3
Total	28.3

Nature protection areas by vegetation zone



Source: Finnish Environment Institute (2009)

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Website: www.mmm.fi

Ministry of the Environment

(Ympäristöministeriö)
Kasarmikatu 25, FIN-00130 Helsinki
Tel. +358 20 610100, fax +358 9 1603 9320
Website: www.environment.fi

Finnish Environment Institute

(Suomen ympäristökeskus)
Mechelininkatu 34 a, FIN-00260 Helsinki
Tel. +358 20 610123, fax +358 9 5490 2190
Website: www.environment.fi
(Governmental expert management of environment)

Finnish Forest Association

(Suomen Metsäyhdistys)
Salomonkatu 17 A, FIN-00100 Helsinki
Tel. +358 9 685 0880, fax +358 9 6850 8820
Website: www.smy.fi
(Joint association for those related to forestry and forest industries)

Finnish Forest Industries Federation

(Metsäteollisuus ry)
Snellmaninkatu 13, FIN-00170 Helsinki
Tel. +358 9 13 261, fax +358 9 132 4445
Website: www.forestindustries.fi

Finnish Meteorological Institute

(Ilmatieteen laitos)
Erik Palmenin aukio, FIN-00560 Helsinki
Tel. +358 9 19291, fax +358 9 179581
Website: www.fmi.fi

Forestry Development Centre Tapio

(Metsätalouden kehittämiskeskus Tapio)

Soidinkuja 4, FIN-00700 Helsinki

Tel. +358 20 772 9000, fax +358 20 772 9008

Website: www.tapio.fi

(Provides expertise particularly for private forestry)

Metsähallitus

Vernissakatu 4, FIN-01300 Vantaa

Tel. +358 20 564100

Website: www.metsa.fi

(State-owned enterprise managing state forests)

MTK Forestry Group

(MTK, Metsäryhmä)

Simonkatu 6, FIN-00100 Helsinki

Tel. +358 20 4131, fax +358 20 413 2409

Website: www.mtk.fi

(MTK is the Central Union of Agricultural Producers and Forest Owners)

Statistics Finland

(Tilastokeskus)

Työpajakatu 13, FIN-00580 Helsinki

Tel. +358 9 17 341, fax +358 9 1734 2474

Website: www.stat.fi

Source: *Finnish Forest Association*

CLIMATE FORECASTS:



Based on CO₂ increase Based on the Sun activity



Based on climate catastrophes

Finnish Scots pine Timberline Tree-Ring Chronology

11 point FFT smoothing

