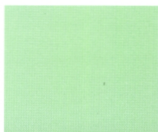




Finnish Forest Research Institute
METLA

FOREST FINLAND

IN BRIEF
1999



FOREST FINLAND IN BRIEF

offers a concise description on Finnish forestry and forest industries in an international context from the viewpoint of forest statistics. For a more detailed description the reader is referred to the Finnish Statistical Yearbook of Forestry with its approximately 200 tables and 60 figures in English.

Ideal growing conditions for conifers, easily workable and valuable tree species, good logging conditions and infrastructure, combined with accessibility to major European markets, have made forests a major source of well-being in Finland. Finns look upon forests not only in the material sense, but also as a valuable ecological and cultural resource.

Finland has firmly committed itself to sustainable forestry in broad sense, including the biodiversity and social and cultural values of the forests. The recently reformed forest and nature-conservation legislation, as well as Finland's National Forest Programme 2010, provide a framework for achieving these ends.

Helsinki, December 1999

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Director

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ISBN 951-40-1719-6 ISSN 1455-7045

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Finnish Forest

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INTERNATIONAL CONTEXT

Major producers and traders

Finland, with its 23.0 million forest hectares (0.6% of the world total), is an important supplier of forest products to global markets. Finland's boreal coniferous forests, with their good mixture of broadleaves, enable annual fellings of over 60 million m³ on a sustained basis, and this allowable cut is increasing. The infrastructure for roundwood procurement is good. The Finnish forest industries are highly export-oriented. In most branches of these industries, 70% to 90% of the production goes abroad. Finland is a major exporter of sawn softwood and paper, particularly graphic papers.

Global roundwood production in 1997

(million m³ under bark):

Industrial wood	1 525	Softwood	1 116
Fuelwood&charcoal	1 857	Hardwood	2 266
	3 382		3 382

The total value of the global export trade of forest products amounted to USD 136 275 million (f.o.b) in 1997, of which Finland's share was 7.6%. In the following tables, the Russian Federation is included in Europe.

World production of softwood, 1997

World	1 116	mill. m ³ u.b.
Europe	322	
USA	289	
Canada	161	
China	152	
Sweden	54	
Russia	53	
Brazil	44	
Finland	43	

World imports of roundwood, 1997

World	140.4	mill. m ³ u.b.
Europe	56.4	
Japan	48.0	
Korea Rep.	9.9	
Sweden	8.7	
Canada	8.4	
China	8.1	
Finland	7.7	
Austria	7.6	

World production of sawn softwood, 1997

World	316.3	mill. m ³
Europe	98.9	
USA	81.5	
Canada	63.8	
Japan	19.3	
China	16.6	
Russia	15.6	
Sweden	15.4	
Germany	13.8	
Finland	10.6	

World exports of sawn softwood, 1997

World	96.1	mill. m ³
Europe	40.2	
Canada	47.7	
Sweden	10.9	
Finland	7.5	
Austria	4.7	
Russia	4.5	
USA	3.9	
Latvia	2.0	
Germany	1.8	

World production of paper and paperboard, 1997

World	297.9	mill. metric tons
Europe	87.3	
USA	86.3	
China	31.6	
Japan	31.0	
Canada	19.0	
Germany	16.0	
Finland	12.1	
Sweden	9.8	
France	8.6	

World exports of paper and paperboard, 1997

World	87.6	mill. m.t.
Europe	49.4	
Canada	14.4	
USA	11.2	
Finland	10.2	
Sweden	8.3	
Germany	7.4	
Austria	3.4	
France	2.8	
Netherlands	2.8	

Source: FAOSTAT Database 1999

Value of global exports of forest-industries' products, 1997

	USD 1 000 mill.	USD per capita
World	136.3	23
Europe	65.6	90
Canada	25.1	839
USA	15.8	58
Germany	10.9	133
Finland	10.4	2 000
Sweden	10.3	1 157
Indonesia	5.1	25
Austria	4.5	556

Source: FAOSTAT
Database 1999

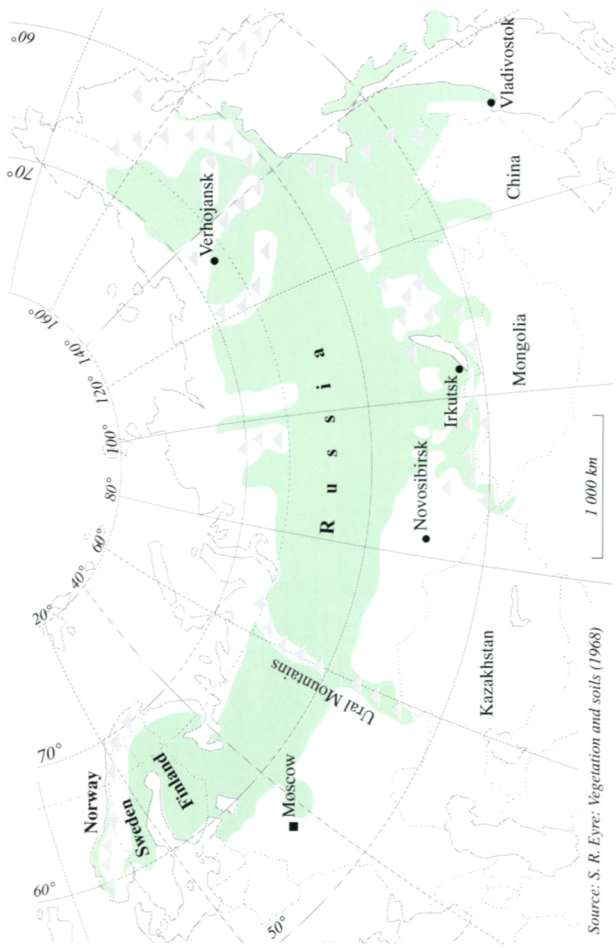
Eurasian boreal forest zone

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 in area is one of the most important providers of roudwood in the world. In the European part and West Siberia, pine and spruce dominate. In East Siberia, Siberian larch, and in the Russian Far East, Dahurian larch are the most important species. In the mountainous Far East, the forests are mostly inaccessible.

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

Eurasian boreal forest zone

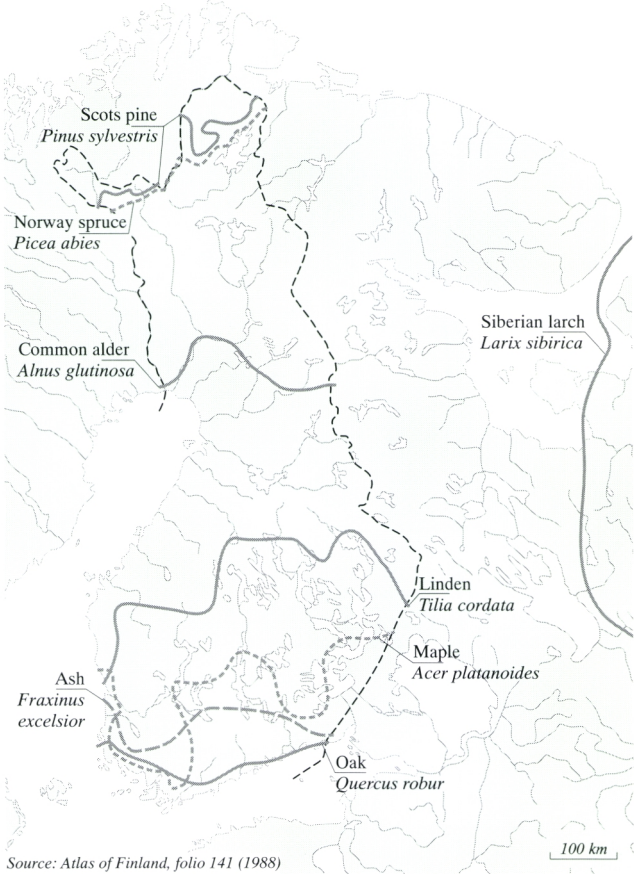


Forest resources of the countries within the Eurasian boreal forest zone at the end of the 1990s

	Forest, total		Forest 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, mill. m³ over bark			
		Conif., %	Conif., %
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, mill. m³ o.b./yr			
		Conif., %	Conif., %
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			
		Conif., %	Conif., %
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

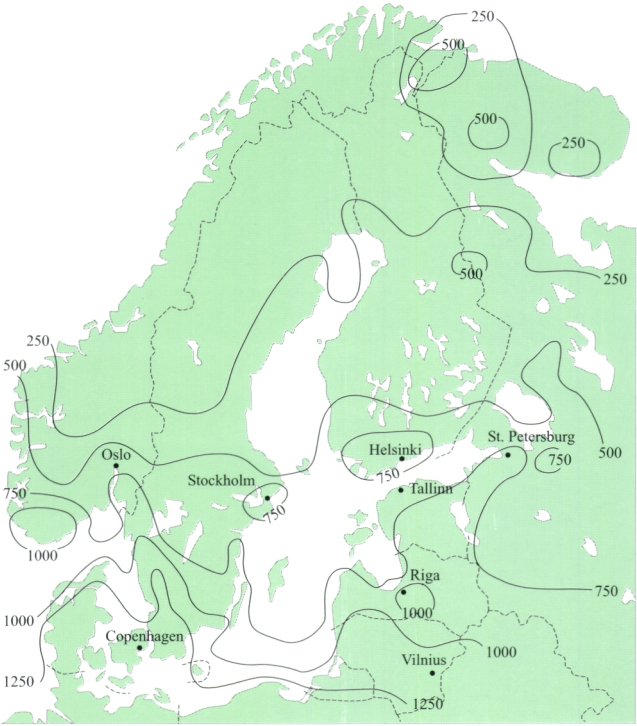
Source: The UN-ECE/
FAO Forest Resource
Assessment 2000

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 1997, in eq/ha/yr



Source: Finnish Meteorological Institute, Norwegian Meteorological Institute / 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, of which Finland became a member in 1995, is the most important customer region for Finnish forest-industries' products; its share is about 70% of both sawn goods and of paper and paperboard exports. Customer-orientation has also led to large Finnish investments in forest-product manufacturing in the region. The capacity of the Finnish-owned paper and paperboard industries in EU countries other than Finland is about six million tonnes, not taking into account Swedish paper mills owned by Finnish-Swedish Stora Enso.

The forest resources of the European Union roughly doubled in 1995 when forest-rich Finland, Sweden and Austria joined the EU.

The European Union

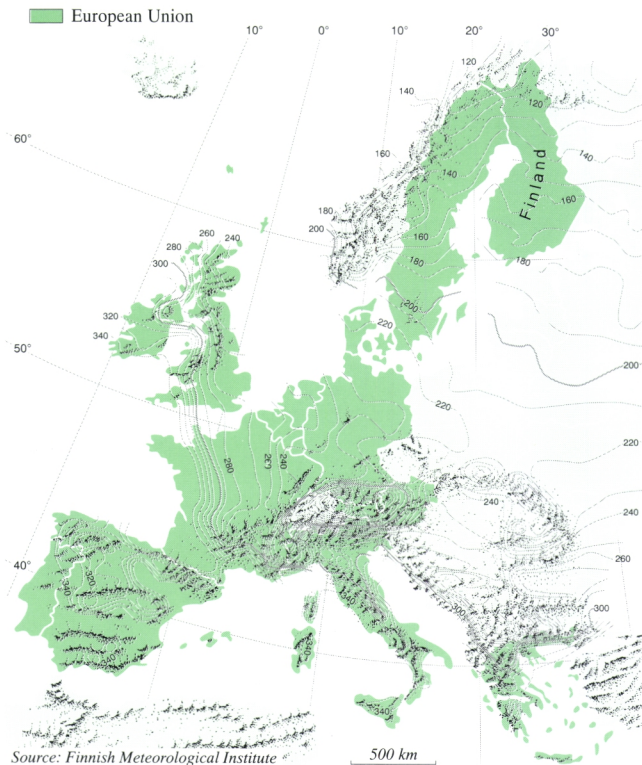
Forest available for wood supply in the European Union

Country	Forest area mill. ha	Growing stock mill. m ³	of which conif., %	Increment in mid-90s mill. m ³ /yr	Removals mill. m ³ /yr
Austria	3.4	1 037	82	27.3	16.9
Belgium	0.6	140	46	5.1	4.4
Denmark	0.4	54	58	3.2	2.2
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
Ireland	0.6	43	92	3.5	2.3
Italy	6.0	877	33	18.7	8.4
Luxembourg	0.1	20	18	0.7	0.4
Netherlands	0.3	52	56	2.2	1.2
Portugal	1.9	188	75	12.9	11.0
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
Total	95.5	13 420	65	459.5	268.2

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

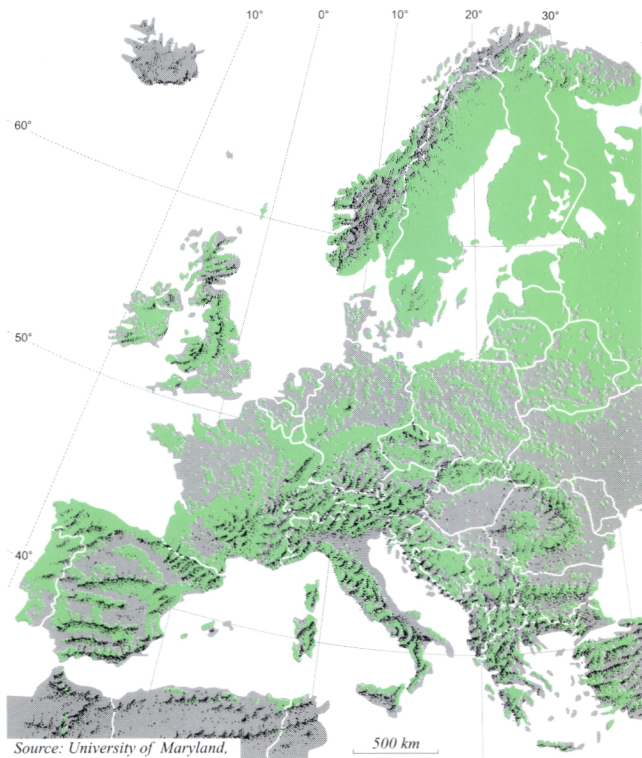
Duration of the growing season in Europe

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



Forest Map of Europe

Tree cover $\geq 10\%$



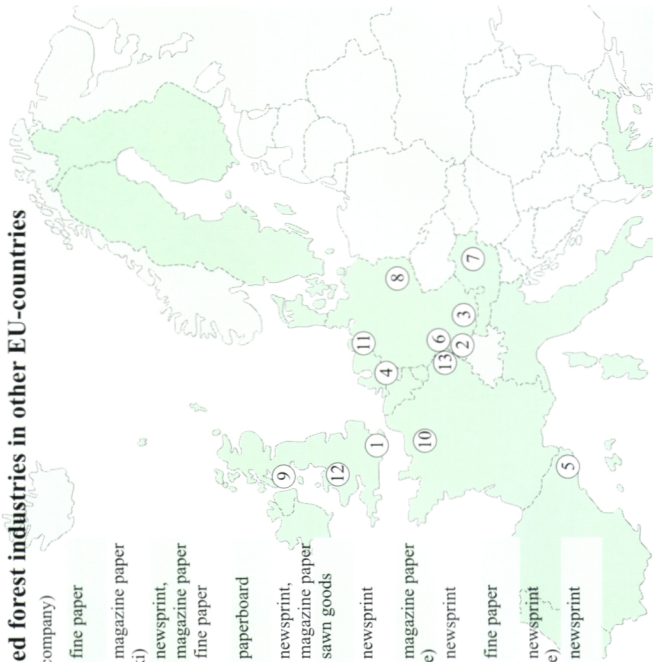
Source: University of Maryland,
World Resources Institute,
Eros Data Center (1999)

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

(Stora Enso is a Finnish-Swedish company)

1. *UK Paper*, fine paper
2. *United Kingdom (Metsä-Serla)* magazine paper
3. *MD Papierfabrik Albrbruck*, Germany (Metsä-Serla/Myllykoski) newsprint, magazine paper
4. *Berghuizer Papierfabriek*, Netherlands (Stora Enso) fine paper
5. *Enso Española*, Spain (Stora Enso) paperboard
6. *E. Holtzmann & Cie*, Germany (Stora Enso) newsprint, magazine paper
7. *Holzindustrie Schweighofer*, Austria (Stora Enso) sawn goods
8. *Sachsen Papier Eilenburg*, Germany (Stora Enso) newsprint
9. *Caledonian Paper*, United Kingdom (UPM-Kymmene) magazine paper
10. *Chapelle Darblay*, France (UPM-Kymmene) newsprint
11. *Nordland Papier*, Germany (UPM-Kymmene) fine paper
12. *Shotton Paper*, United Kingdom (UPM-Kymmene) newsprint
13. *Stracel*, France (UPM-Kymmene) newsprint

Source: Finnish Forest Industries Federation (1999)



Finnish exports of forest industry products to the European Union, 1998

	Sawn goods 1000 m ³	Plywood and veneer	Particle board	Fibre board 1000 m.t.	Wood Pulp	Paper and paperboard
Austria	140	22	-	-	16	136
Belgium–Luxemb.	143	15	0	3	33	726
Denmark	603	45	24	2	0	295
France	886	89	-	1	116	801
Germany	1 100	219	0	8	703	1 930
Greece	128	2	-	1	1	125
Ireland	201	9	2	2	3	62
Italy	270	39	-	1	115	358
Netherlands	787	121	2	9	57	575
Portugal	6	5	-	-	46	77
Spain	143	23	-	-	19	782
Sweden	58	85	19	4	67	307
United Kingdom	1 376	81	93	25	255	1 910
EU, total	5 840	755	140	56	1 431	8 083
% of total exports	70	82	76	88	88	69

Source: National Board of Customs

FINNISH FORESTRY AND FOREST INDUSTRIES

National economy, forestry and the forest industries

In order to achieve economic growth in post-war Finland, investments in pulp and paper industries doubled the production between 1955 and 1965. This trend has continued, and not only in the forest industries, but also in the metal industries and more recently in the high-tech electronic industry.

In 1960, roundwood and forest-industries' products represented 75% of the value of the total exports of goods; their share was 30% in 1998. The same diversification of production is, of course, to be seen in the structure of the gross domestic product. In 1960, the share of forestry of the GDP was 8.6%, and that of basic forest industries, 6.4%. The corresponding figures for the year 1998 were 2.5% and 5.4%. In employment, forestry accounted for 6.6% and forest industries for 5.2% in 1960. In 1998, the corresponding figures were 1.1% and 3.2% respectively.

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

Forestry and forest industries in the Finnish national economy, 1998

Gross domestic product

at market prices	FIM 686 742 million
at basic prices	FIM 592 487 million
of which forestry	2.5 %
forest industries	5.4 %

Total employment 2.22 million persons

of which forestry	1.1 %
forest industries	3.2 %

Total exports of goods FIM 230 569 million

of which forestry	0.2 %
forest industries	29.3 %

FIM 1.0 = USD 0.19
Source: Statistics
Finland

Finland is among the major suppliers of forest-related products to the world markets, particularly in printing and writing paper, and one of the biggest importers of roundwood. In 1998, the total value of forest-industries' products exports amounted to FIM 68 000 million (about USD 13 000 million). Germany, the United Kingdom and France are the foremost importers of Finnish forest-industries' products, together accounting for 42% of the total.

Forest industries: production and exports

Production of Finnish forest industries, 1996–98

Product	Unit 1 000	1996	1997	1998
Sawn goods	m ³	9 370	10 670	11 370
Plywood and veneer	"	869	987	992
Particle board	"	498	475	455
Fibreboard	m.t.	77	88	100
Mechanical pulp	"	3 957	4 469	4 637
Chemical pulp	"	5 736	6 620	6 718
Pulp, total	"	9 693	11 089	11 355
Newsprint	"	1 327	1 470	1 483
Other graphic papers	"	5 837	7 121	7 700
Kraft paper	"	462	474	451
Other paper	"	397	478	482
Paper, total	"	8 023	9 543	10 116
Paperboard	"	2 419	2 606	2 586
Paper and paperboard	"	10 442	12 149	12 703

Source: Finnish Forest Industries Federation

Finnish forest industry exports, 1996–98

Product	Unit 1 000	1996	1997	1998
Sawn goods	m ³	7 036	7 534	8 308
Plywood	"	795	879	832
Particle board	"	238	197	184
Fibreboard	m.t.	55	56	64
Mechanical pulp	"	69	90	88
Chemical pulp	"	1 473	1 662	1 546
Newsprint	"	1 051	1 211	1 199
Other graphic papers	"	5 498	6 799	7 361
Kraft paper	"	279	351	312
Other paper	"	293	346	357
Paper, total	"	7 120	8 707	9 229
Paperboard	"	1 942	2 094	2 118
Converted paper products	"	415	445	408
Total paper and paperboard	"	9 477	11 246	11 755

Source: National Board of Customs

Value of Finnish forest industry exports, 1998

Country					FIM mill.
	Sawn goods	Wood-based panels, other wood products	Pulp	Paper, paper-board, converted products	Total
Austria	142	193	36	552	923
Belgium-Luxembourg	130	143	79	2 833	3 185
Denmark	678	312	0	1 172	2 162
France	821	273	284	3 478	4 856
Germany	1 129	1 700	1 608	7 791	12 228
Greece	132	10	3	444	589
Ireland	204	40	9	213	466
Italy	327	180	258	1 388	2 153
Netherlands	692	376	130	2 359	3 557
Portugal	6	21	102	304	433
Spain	136	123	42	2 911	3 212
Sweden	70	616	153	1 449	2 288
United Kingdom	1 634	715	613	7 963	10 925
EU total	6 100	4 706	3 317	32 855	46 978
Other Europe	274	1 445	207	5 097	7 023
Europe total	6 374	6 151	3 524	37 952	54 001
Asia	870	487	191	3 491	5 039
Africa	1 139	19	14	591	1 763
North America	54	195	38	3 927	4 214
Latin America	0	6	2	1 488	1 496
Oceania	13	9	0	944	966
Grand total	8 449	6 867	3 770	48 393	67 479

FIM 1.0 = USD 0.19

Source: National Board of Customs

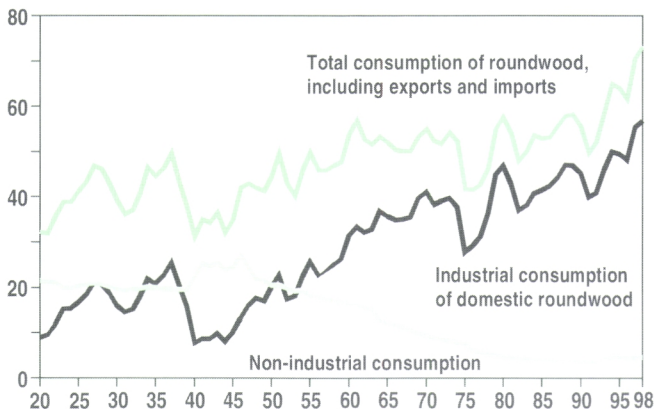
Wood consumption

Despite a multiple increase in wood pulp production, total wood consumption in Finland remained at approximately the same level during the 30-year period from 1960. The years 1994 to 1996 were the first ones in which annual wood consumption exceeded 60 million m³, and in the following two years the consumption exceeded 70 million m³. Many structural changes, such as reductions in fuelwood consumption and roundwood exports, as well as the increased use of industrial wood residues, contributed to rather modest increases in total wood consumption until the year 1993. Industrial wood consumption has shown a continuous strong upward trend.

In 1998, total roundwood consumption reached 73.3 million m³, including imports and exports. Industrial wood consumption was 67.7 mill. m³. Imported roundwood (10.9 mill. m³) accounted for 16 % of industrial wood consumption.

Roundwood consumption in Finland, 1920–98

mill. m³



Non-industrial consumption does not include exports of roundwood.

Source: Finnish Forest Research Institute

Roundwood consumption during 5 -year periods, 1985–98

Consumption category	1985–89	1990–94	mill. m ³ /yr 1995–98
Exports	1.3	1.0	1.0
Industrial roundwood	44.4	44.4	52.5
sawmills and panel industr.	20.3	20.0	26.5
pulp industries	24.1	24.4	26.0
Fuelwood and other	3.9	4.1	4.6
Domestic roundwood total	49.6	49.5	58.1
Imported wood (industries)	6.1	6.8	9.3
Total consumption	55.7	56.3	67.4

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

Source: Finnish Forest Research Institute

Roundwood consumption and roundwood exports, 1996–98

Consumption category	1996	1997	1998
			mill. m ³
Total consumption in Finland	60.9	69.6	72.3
Pine	21.9	26.0	26.8
Spruce	23.8	26.4	28.1
Hardwood	14.5	16.4	16.6
Unspecified	0.7	0.8	0.8
Domestic roundwood	52.9	60.1	61.5
<i>Pine: Pinus sylvestris</i>			
Pine	20.0	24.0	24.7
Spruce	23.2	25.6	27.1
<i>Spruce: Picea abies</i>			
Hardwood	9.7	10.5	9.7
<i>Hardwood: mainly Betula sp.</i>			
Imported wood	8.0	9.5	10.8
Pine	1.9	2.0	2.1
Spruce	0.6	0.7	1.1
Hardwood	4.8	6.0	6.8
Unspecified	0.7	0.8	0.8
<i>'Unspecified' consists of imported wood chips and residues.</i>			
Exports, incl. poles	0.9	1.0	1.0
Pine	0.6	0.7	0.7
Spruce	0.2	0.2	0.2
Hardwood	0.1	0.1	0.1

Source: Finnish Forest Research Institute

Wood consumption in sawmilling, plywood and pulp industries, 1996–98

Year	Domestic roundwood		Imported wood	Wood residues	Total
	Conif.	Hardwood			
Sawmilling					
1996	20.9	0.2	0.6	-	21.7
1997	24.2	0.2	0.9	-	25.3
1998	26.1	0.2	1.1	-	27.4
Plywood and veneer industry					
1996	1.4	1.0	0.2	-	2.6
1997	1.6	1.1	0.3	-	3.0
1998	1.5	1.1	0.4	-	3.0
Mechanical pulp industry					
1996	7.9	0.6	0.4	2.2	11.1
1997	9.0	0.7	0.3	2.6	12.6
1998	9.3	0.6	0.4	2.7	13.0
Chemical pulp industry					
1996	10.9	4.7	6.7	7.0	29.4
1997	12.7	5.3	8.0	8.1	34.1
1998	12.8	4.7	8.8	8.7	35.1

Source: Finnish Forest Research Institute

Labour force

Efficient multi-function timber harvesters (nowadays numbering about 1 300) prevail in logging operations. Mechanization in logging has led to a continuous fall in the number of forest workers. Today, a workforce of only about 6 000 men are employed in logging proper.

Forestry employed 24 000 people in 1998, compared with 63 000 in 1980. The same trend applies to the basic forest industries. They employed 120 000 people in 1980, but only 72 000 in 1998. However, production has increased about 60% during the same period. Consequently, forestry and forest industries, even during a boom, have no direct ameliorating effect on Finland's chronic unemployment problem (9.5% in October 1999).

Employment in forestry and forest industries, 1996–98

	1996	1997	1000 persons 1998
Forestry	26	23	24
Forest industries	73	72	72
Forest sector, total	99	95	96
Employment, total	2 127	2 169	2 222
Unemployed, total	363	314	285
Unemployment rate, %	14.6	12.7	11.4

Source: Statistics Finland

Employment in forest industries, 1996–98

Branch of industry	1996	1000 persons	
		1997	1998
Sawmilling	11	12	12
Plywood and veneer industry	6	6	5
Other board industries	1	1	1
Other wood-products industry ¹	13	14	13
Pulp industry	19	17	15
Paper industry	18	19	22
Paperboard industry	5	4	4
Forest industries, total	73	72	72

¹ Including carpentry products and pre-fabricated wooden houses.

Sources: Statistics Finland, Finnish Forest Research Institute

Commercial roundwood removals in 1998 amounted to record-high 55.1 million m³, of which an unusually high proportion (89%) came from non-industrial, private forests. Fellings have been at a very high level during the last five years.

Logging in non-industrial, private forests is mainly carried out by the forest industries or by their wood-procurement organisations. In 1998, forest owners themselves carried out or organized the logging of 10.3 million m³, or 21% of the commercial roundwood removed from their forests.

Roundwood prices have been increasing since 1993 due to high demand. In 1999, however, the price increases have levelled out, except for spruce logs, which has continued to rise.

Roundwood markets

Roundwood procurement and consumption in Finland, 1998

Sources	mill. m ³
Commercial roundwood	
from private-owned forests	48.9
from industry-owned forests	2.1
from state-owned forests	4.1
Non-commercial wood (priv. for.)	5.8
Domestic roundwood, total	60.9
Imported wood	12.0
Roundwood procurement, total	72.9
Consumption	
Sawmilling	27.4
Wood-based panels	3.1
Other wood-based products	0.6
Mechanical pulp industry	10.3
Chemical pulp industry	26.4
Industry, total	67.7
Fuelwood in dwellings	4.6
Exports of roundwood	1.0
Roundwood consumption, total	73.3

Imported wood is mostly birch pulpwood from Russia. In addition, sawmills furnished pulp industry with 11.5 mill. m³ of wood chips and residues.

Source: Finnish Forest Research Institute

Roundwood removals by ownership category, 1996–98

Ownership category	mill. m ³		
	1996	1997	1998
Private forests ¹	45.6	52.9	54.7
commercial	39.9	47.1	48.9
non-commercial	5.7	5.8	5.8
Forests industries	2.6	1.7	2.1
Forest and Park Service ²	4.4	4.1	4.1
Commercial, total	46.9	53.0	55.1
Grand total	52.6	58.8	61.0

¹ including here communes, parishes and some other public owners.

² a state-owned enterprise managing most of the state-owned forests.

Source: Finnish Forest Research Institute

Roundwood removals by assortment, 1996–98

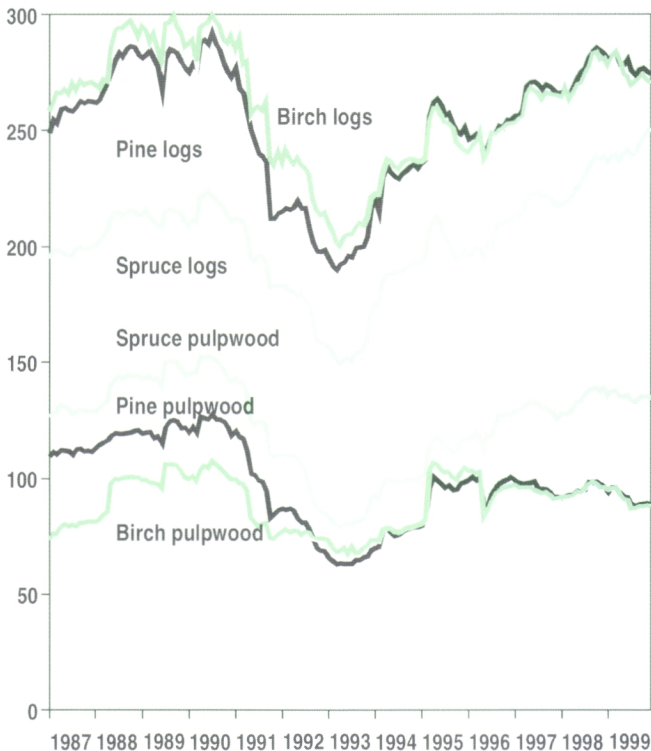
Roundwood assortment	mill. m ³		
	1996	1997	1998
Logs	23.0	27.0	27.7
pine logs	9.0	10.3	10.9
spruce logs	12.9	15.4	15.4
hardwood logs	1.0	1.3	1.5
Pulpwood	23.9	25.8	27.3
pine pulpwood	10.3	10.8	12.1
spruce pulpwood	9.0	10.0	9.9
hardwood pulpwood	4.6	5.0	5.3
Commercial fuelwood ¹	0.1	0.1	0.1
Commercial removals, total	46.9	53.0	55.1
Non-commercial removals	5.7	5.8	5.8
Grand total	52.6	58.8	61.0

¹ only that purchased by industry.

Source: Finnish Forest Research Institute

Stumpage prices in non-industrial, private forestry, 1987–99

FIM/m³ in December 1999 money



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

Source: Finnish Forest Research Institute

Currently, about 110–120 000 hectares of forest land are planted or seeded annually for forestry, and favouring almost exclusively native tree species. Seed-tree or shelterwood fellings account for 50–70 000 hectares annually.

About 160 000 hectares of seedling stands are treated annually with silvicultural measures. About half of Finland's mires (wetlands) have been drained for forestry, but nowadays this draining activity, except for ditch cleaning, has almost ceased. The same applies to forest fertilization, although lately it has been increasing.

The total costs of silvicultural and forest improvement work were FIM 1 167 million (about USD 220 million) in 1998. Of the FIM 984 million spent in non-industrial, private forestry, forest owners' own financing or work accounted for 69%, and the rest was financed through state grants (30%) and loans (1%).

Silvicultural and forest improvement work

Felling activities, 1996–98

Type of felling	1 000 ha		
	1996	1997	1998
Thinnings	193	272	284
Clear fellings	120	130	117
Seed-tree and shelterwood fellings	53	65	49
Removal of seed-tree and shelterwood	37	58	50
Other fellings	5	5	6
Total	409	530	507
% of forest area	1.8	2.3	2.2

Source: Finnish Forest Research Institute

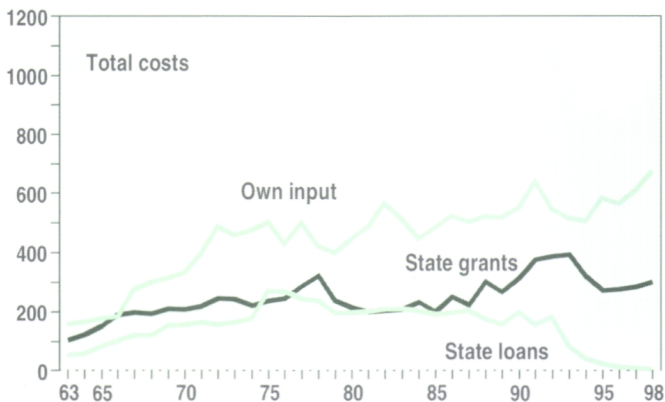
Silvicultural and forest improvement work, 1997–98

Type of work		1997	1998
Clearing of regeneration area	1000 ha	71	74
Soil preparation	"	121	121
Artificial regeneration	"	113	111
Seedling stand improvement	"	154	204
Forest fertilization	"	19	21
Drainage of mires	"	8	4
Maintenance of drainage	"	81	69
Construction of forest roads	km	1 952	1 676
Improvement of forest roads	"	1 283	1 172
Total costs	FIM mill	1 074	1 167

Source: Finnish Forest Research Institute

Financing of silvicultural and forest-improvement works in non-industrial, private forests 1963–98

FIM mill. in 1998 money



Source: Finnish Forest Research Institute

Forest resources

Information on Finland's forest resources is based on surveys carried out by the Finnish Forest Research Institute. Traditionally, systematic ground sampling has been used. Since 1990, satellite imagery and digital map data have been employed in order to produce results also for small areas. The inventory years to date have been as follows:

I	1921–24	IV	1960–63	VII	1977–84
II	1936–38	V	1964–70	VIII	1986–94
III	1951–53	VI	1971–76	IX	1996–

Despite the 13% reduction in forest area in 1944 due to the war, Finland's wood resources are currently more plentiful than in the pre-war years. According to the 1st national forest inventory, the total growing stock volume was 1 588 million m³. The newest estimate, based partly on the 9th inventory, is 1 927 million m³. In recent years, the annual volume increment has exceeded the drain by a good 10 million m³.

During the past 70 years, the structure of Finnish forests has changed significantly. They now have a more even age structure. Scots pine's share of the growing stock is 46% and that of Norway spruce 36%, leaving 18% for the broadleaved species, mostly birch. This distribution has been a stable one. However, Scots pine is the dominant species on 65% of the forest land area.

The area of productive forest land (i.e. land capability to yield at least 1 m³/ha/yr) is 20.1 million hectares and that of other wooded land 2.9 million hectares. Thus, the total wood-growing area is 23.0 million hectares. Of this, 1.16 million hectares (5.1%) have been set aside for conservation purposes. These areas, in which all forestry activities are prohibited, lie almost entirely in the northern part of the country. The Finnish concepts of forest land and other wooded land both enter into the new, internationally defined forest-land concept, which sets a canopy cover of 10% as the threshold between forest lands and other lands.

The following tables are based on the combined 8th and 9th national forest inventories in such a way that always the most recent regional data have been used. Nature conservation areas are always included.

Principal land use categories in Finland, 1986–98

	mill. ha
Total area	33.8
Inland watercourses	3.3
Land area	30.5
Forest land	20.1
Other wooded land	2.9
Waste land ¹	3.1
Roads, depots	0.2
Forestry land, total	26.3
(of which nature conservation areas)	2.7)
Agricultural land	2.9
Built-up areas	0.9
Transport routes	0.4

¹ Treeless mountains and mires and such a like.

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, 1986–98

	mill. ha
Mineral soils	17.2
Mires	8.9
Roads, depots	0.2
Forestry land, total	26.3
Spruce mires	2.3
Pine mires	4.9
Treeless mires	1.7
Total	8.9
Undrained mires	4.2
Recently drained mires	0.7
Transforming mires	3.0
Transformed mires	1.0
Total	8.9

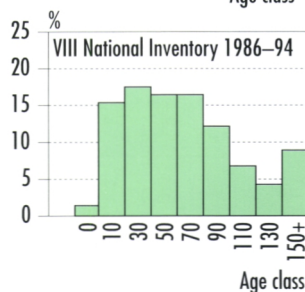
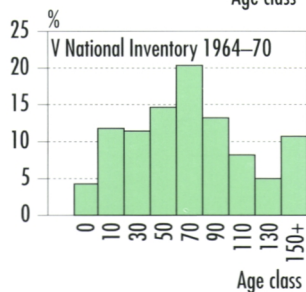
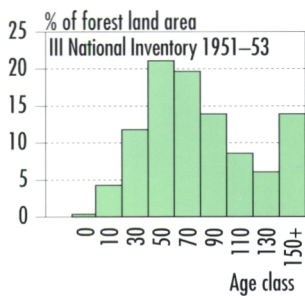
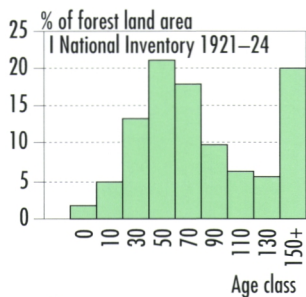
Dominant tree species of forest stands, 1986–98

		% ¹	
Temporarily non-stocked		1.5	
Scots pine	<i>Pinus sylvestris</i>	64.8	¹ of forest land area.
Norway spruce	<i>Picea abies</i>	25.1	
Other coniferous		0.1	Note that of volume share of the broadleaved species is much greater.
Silver birch	<i>Betula pendula</i>	1.7	
Downy birch	<i>Betula pubescens</i>	6.2	
Aspen	<i>Populus tremula</i>	0.3	
Alder	<i>Alnus sp.</i>	0.3	
Other broadleaves		0.0	
Total		100.0	Source: Finnish Forest Research Institute
Forest land area	(mill. ha)	20.1	

Timber resources in Finland, 1986–98

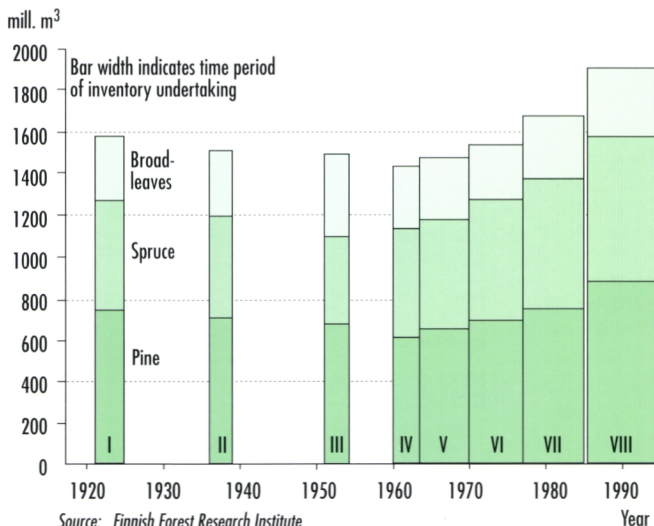
Forest and other wooded land	mill. ha	23.0	
Growing stock volume	mill. m ³	1 927	
Scots pine	"	893	
Norway spruce	"	687	
Birch	"	284	
Other broadleaves	"	62	
Volume increment	mill.m ³ /yr	78.3	
Scots pine	"	33.3	
Norway spruce	"	27.5	
Birch	"	13.3	
Other broadleaves	"	4.2	Source: Finnish Forest Research Institute

Age structure development of the Finnish forests



Source: Finnish Forest Research Institute

Growing stock volumes according to eight national forest inventories



Forest ownership in Finland, 1986–98

Ownership category	Forest land mill. ha	Forestry land mill. ha	%
Non-indust., private	12.4	14.3	54.3
Industrial, private	1.8	2.0	7.8
State	4.9	8.7	33.2
Other public	1.0	1.3	4.8
Total	20.1	26.3	100.0

Source: Finnish Forest Research Institute

Non-industrial private ownership of forests, 1990

Ownership group	%	
	On holdings/ owners	On forest land area
Family ownership	76	76
Group ownership	6	7
Heirs ownership	18	17
Farmers	32	42
Wage earners	27	24
Entrepreneurs	5	5
Pensioners	36	29
Age < 40 years	14	16
Age 40–59 years	44	45
Age 60+ years	42	39
Reside permanently on holding	59	66
Reside part of year on holding	9	9
Reside elsewhere	32	25

The figures apply to forest holdings with 5+ ha of forest land, of which there are about 280 000, and their corresponding forest land area is 12.4 million ha.

Source: Finnish Forest Research Institute

Growing stock volume by ownership category, 1986–98

Ownership category	Scots pine	Norway spruce	Broad-leaves	mill. m ³	
				Total	%
Non-indust., private	555	526	253	1 334	69.2
Industrial, private	84	49	24	157	8.1
State	209	80	53	342	17.7
Other public	45	32	17	94	4.9
Total	893	687	347	1 927	100.0

Source: Finnish Forest Research Institute

Annual volume increment by ownership category, 1986–98

Ownership category	Scots pine	Norway spruce	Broad-leaves	mill. m ³ /yr	
				Total	%
Non-indust., private	21.1	21.9	13.5	56.4	72.1
Industrial, private	4.1	2.2	1.4	7.7	9.9
State	6.3	2.1	1.8	10.2	13.1
Other public	1.8	1.3	0.9	3.9	5.0
Total	33.3	27.5	17.5	78.3	100.0

Source: Finnish Forest Research Institute

Mean growing stock volume and annual increment by ownership category, 1986–98

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

Ownership category	Mean volume m ³ /ha	Increment m ³ /ha/yr	Increment %
Non-industrial, private	106	4.5	4.2
Industrial, private	87	4.3	4.9
State	64	2.0	3.1
Other public	93	3.9	4.2
Total	94	3.8	4.1

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

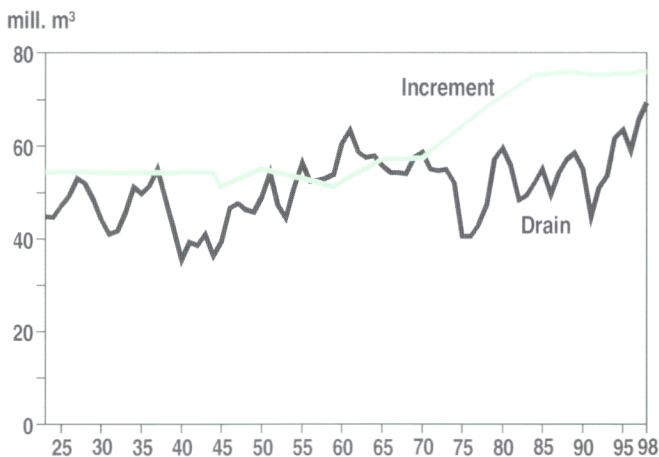
Note. Increments for 1995–98 are forecasts.

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

Source: Finnish Forest Research Institute

		1985–89	1990–94	mill. m ³ /yr 1995–98
Scots pine	I	32.2	33.3	33.1
	D	20.9	20.0	24.6
Norway spruce	I	26.9	25.2	25.7
	D	21.9	22.3	27.5
Broadleaves	I	16.5	16.8	16.9
	D	12.1	11.0	12.3
Total	I	75.6	75.3	75.7
	D	54.9	53.2	64.4

Growing stock increment and drain, 1923–98



Multiple-use production of forests, 1996–98

Product		1996	1997	1998
Commercial roundwood	mill. m ³ o.b.	47	53	55
Non-commercial roundwood	mill. m ³ o.b.	6	6	6
Commercial forest berries	m.t. ¹	6 718	11 017	8 441
Commercial forest mushrooms	m.t. ¹	377	623	1 408
Lichen picked for exporting	m.t.	254	298	311
Moose venison	m.t.	3 921	3 440	4 329
Hare	m.t.	993	938	975
Forest game birds	m.t.	310	200	157
Fur-bearing animals	1000 indiv.	210	261	237
Reindeer meat production	m.t.	2 700	2 000	2 000

¹ Quantities offered for sale, in metric tons.

Sources: Finnish Forest Research Institute, Finnish Game and Fisheries Research Institute

Forest condition in Finland, 1986–98

Forest land area, total 20.1 mill. ha

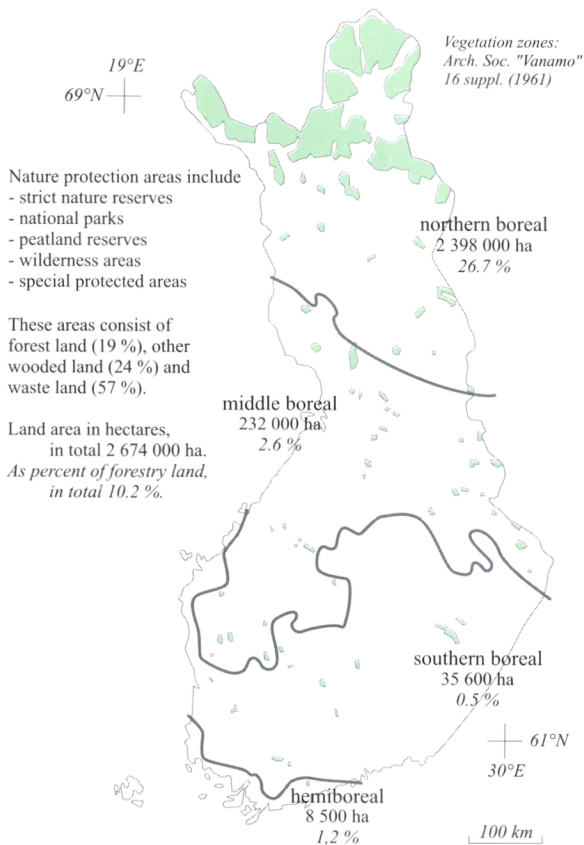
Extent of damage affecting stand quality	% of forest land
Totally damaged	0.3
Severely damaged	4.1
Moderately damaged	17.8
Total	22.2

Damaging agents

<i>In two-storeyed stands only damage affecting the dominant storey is taken into account.</i>	Natural competition	1.4
	Climatic factors	5.4
	Harvesting damage	0.8
	Moose	1.3
	Voles	0.0
	Insects	0.3
	Fungi	6.8
	Unidentified	6.3
	Total	22.2

Source: Finnish
Forest Research
Institute

Nature protection areas by vegetation zone



Source: Finnish Environment Institute (1999)

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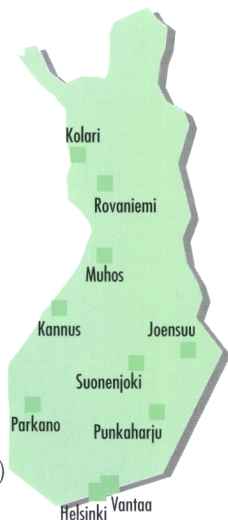
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The Finnish Society of Forest Science and the Finnish Forest Research Institute jointly publish the scientific journals *Acta Forestalia Fennica* and *Silva Fennica*.

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Silva Fennica is a refereed quarterly with an international distribution. It covers all aspects of forest research. In addition to original research articles, the journal publishes review articles, research notes, discussion papers, book reviews, and information on forthcoming events.

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(MTK is the Finnish Federation of Agricultural and Forestry Producers)

Statistics Finland

(Tilastokeskus)

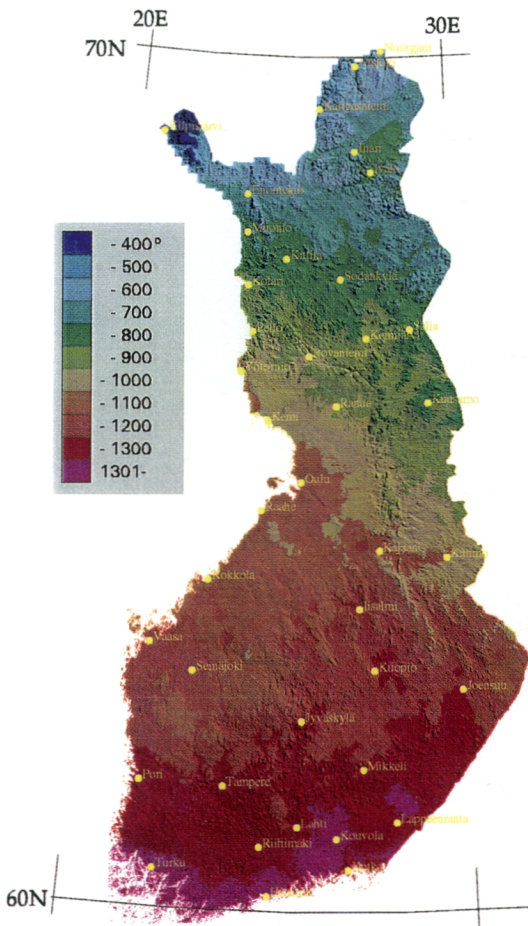
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Website: www.stat.fi

Source: *Finnish Forestry Association*



Source: Finnish Forest Research Institute

Mean Effective Temperature Sum in Finland
(threshold +5 °C)