

FOREST FINLAND

IN BRIEF

2001

Finnish Forest Research Institute

METLA



88.0	18.0	20.3	85.3
45.3	14.8	26.3	86.5
81.9	18.3	28.8	111.0
77.7	19.1	24.6	131.4
89.1	16.3	32.2	139.6
84.8	21.1	26.7	132.6
81.6	24.4	26.8	142.8
84.4	20.1	27.6	132.1
85.4	18.2	29.2	131.9
89.5	17.0	31.7	138.2
102.2	14.7	28.5	145.3
103.3	11.3	26.6	141.2
96.1	10.3	26.2	132.6
92.8	2.4	21.1	126.3
90.9	11.2	19.2	121.4
14.8	20.3	128.3	
16.4	19.3	117.5	
16.6	19.6	115.5	
16.9	21.1	115.2	
1	22.3	128.7	
1.8	23.5	141.4	
4	23.6	151.0	
3	23.0	145.5	
	25.2	140.5	
	23.7	129.2	
	6.1	133.5	
	3.5	121.7	
	1.6	110.9	
	3.4	120.3	
	22.5	121.1	
	21.8	130.9	
	18.3	122.5	
	18.3	110.9	
	18.7	108.0	

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

Helsinki, August 2001

Martti Aarne
Project Manager

Editor:
Yrjö Sevola
Lay-out:
A-K Korhonen
Graphs:
Aarre Peltola
Maps: Spatio Oy
Photos:
Erkki Oksanen
Cover:
PlusProjectori Oy

Compiled at
The Finnish Forest Research Institute
Forest Statistics Information Service
Unioninkatu 40 A
FIN-00170 Helsinki, Finland
Tel. +358 9 8570 51, fax +358 9 8570 5717
E-mail: yrjo.sevola@metla.fi
Website: www.metla.fi/hanke/3006/index-en.htm
ISBN 951-40-1785-4 ISSN 1455-7045

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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 1999

(million m³ under bark):

Industrial wood	1 526	Softwood	1 121
Fuelwood&charcoal	1 749	Hardwood	2 154
	3 275		3 275

The total value of the global export trade of forest products amounted to USD 133 893 million (f.o.b) in 1999, of which Finland's share was 8.2%. In the following tables, the Russian Federation is included in Europe.

World production of softwood, 1999

World	1 121	mill. m ³ u.b.
Europe	345	
USA	295	
China	283	
Canada	149	
Russia	73	
Sweden	53	
Finland	45	
Brazil	44	

World imports of roundwood, 1999

World	112.4	mill. m ³ u.b.
Europe	56.0	
China	23.8	
Japan	16.6	
Sweden	10.5	
Finland	10.3	
Austria	7.2	
USA	7.1	
Canada	7.0	

World production of sawn softwood, 1999

World	323.2	mill. m ³
Europe	104.8	
USA	86.9	
Canada	68.2	
Japan	17.3	
Russia	15.1	
Germany	14.8	
Sweden	14.6	
Finland	12.7	
China	9.8	
Austria	9.6	
Brazil	8.6	

World exports of sawn softwood, 1999

World	101.7	mill. m ³
Europe	45.1	
Canada	48.3	
Sweden	11.0	
Finland	8.3	
Russia	6.1	
Austria	5.6	
USA	3.2	
Latvia	2.4	
Germany	2.0	
Czech Rep.	1.5	
Chile	1.4	

World production of paper and paperboard, 1999

World	316.7	mill. metric tons
Europe	93.8	
USA	88.0	
China	73.4	
Japan	30.6	
Canada	20.1	
Germany	16.7	
Finland	12.9	
Sweden	10.1	
France	9.5	
Korea Rep.	8.9	
Italy	8.6	

World exports of paper and paperboard, 1999

World	90.7	mill. metric tons
Europe	55.0	
Canada	14.7	
Finland	11.2	
Sweden	8.8	
Germany	7.8	
USA	7.0	
China	6.5	
France	4.6	
Austria	3.1	
Netherlands	2.8	
Korea Rep.	2.7	

Value of global exports of forest-industries' products, 1999

	USD 1 000 mill.	USD per capita
World	133.9	22
Europe	67.1	92
Canada	25.5	832
USA	14.8	54
Finland	10.9	2 100
Germany	9.9	121
Sweden	9.7	1 092
China	6.8	5
France	5.7	97

Source: FAOSTAT
Forestry Data 2001

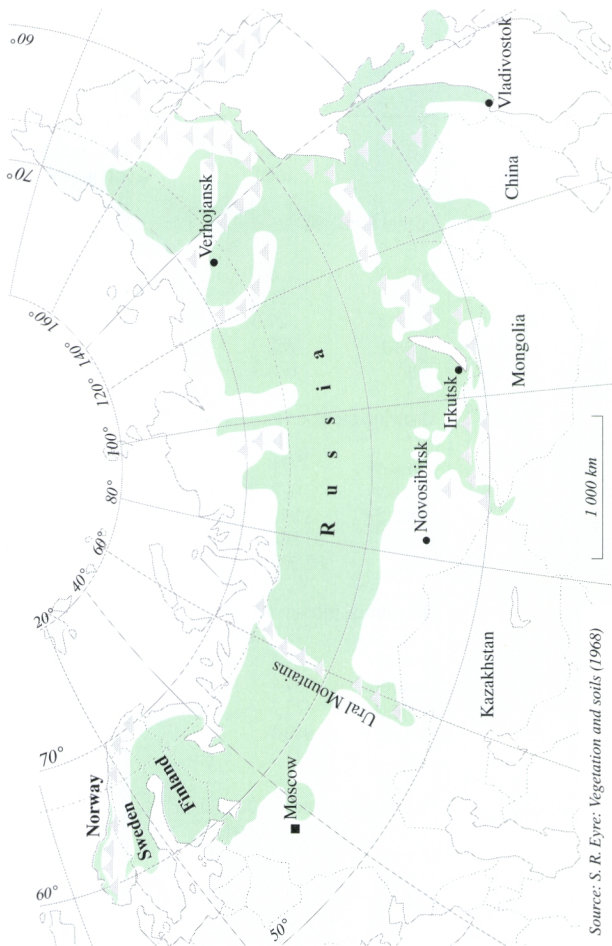
Eurasian boreal forest zone

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 over 800 million hectares in area is one of the most important providers of roundwood 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. The Russian figures are up-dated.

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

	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	752.0	50	451.2
Total	809.9	50	499.7

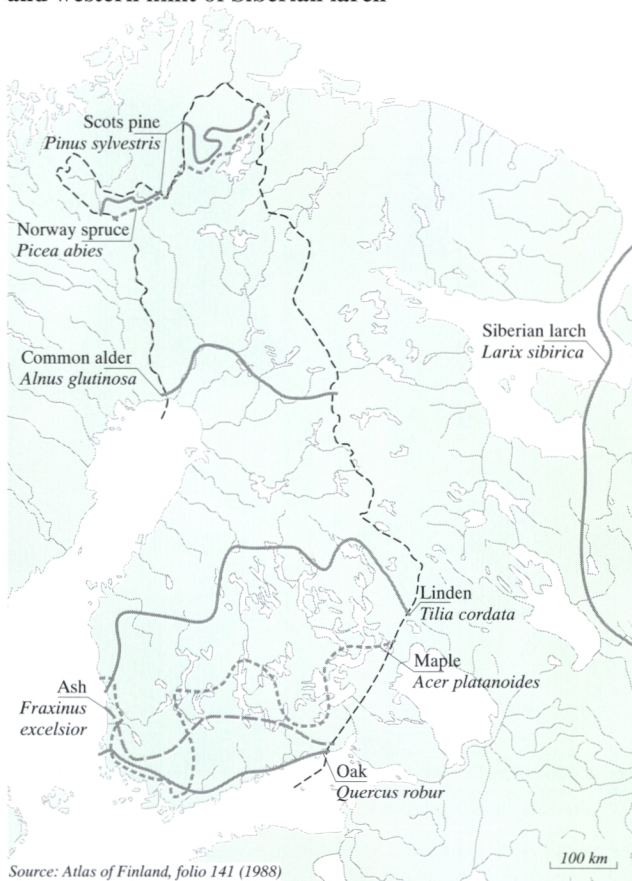
Growing stock on forest land, mill. m ³ over bark				
		Conif., %		Conif., %
Norway	771	77	671	80
Sweden	2 928	84	2 567	85
Finland	1 940	82	1 867	82
Russia	81 864	76	51 091	78
Total	87 503	76	56 196	78

Net annual increment on forest land, mill. m ³ 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	949.1	66	655.0	71
Total	1 141.3	68	834.9	73

Removals in mid-1990s , mill. m ³ 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

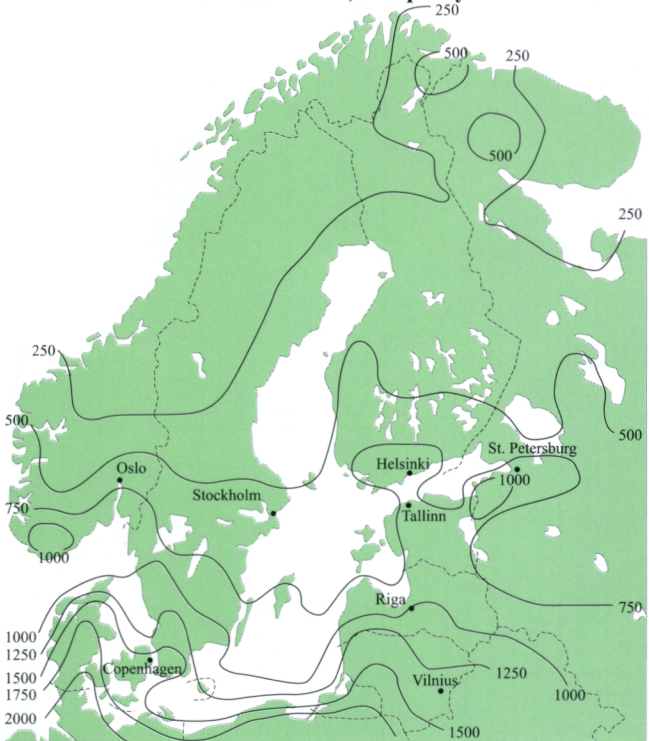
Source: The UN-ECE/
FAO Forest Resource
Assessment 2000

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 1998, 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

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 ten million tonnes, not taking into account M-real's and Stora Enso's paper mills in Sweden.

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

Forests 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

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 $\geq 10\%$

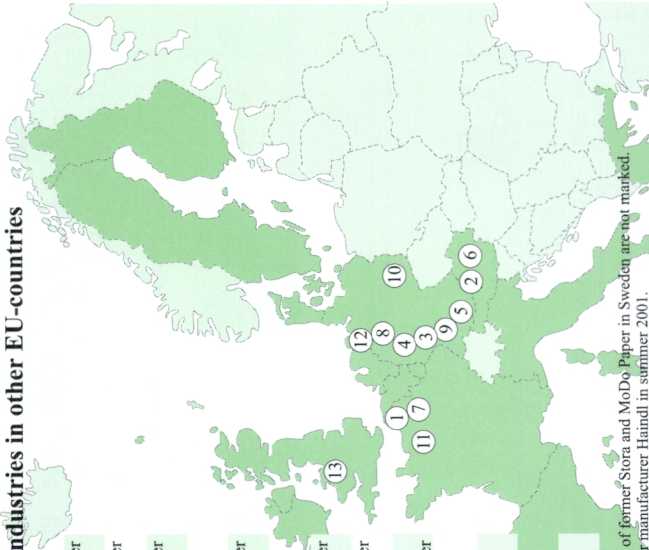


Source: University of Maryland,
World Resources Institute,
Eros Data Center (1999)

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

(excl. Sweden)

- | | |
|--|------------------------------|
| 1. <i>MoDo Paper Alizay</i> ,
France (M-real) | pulp, fine paper |
| 2. <i>MoDo Paper Hallein</i> ,
Austria (M-real) | pulp, fine paper |
| 3. <i>MoDo Paper Stockstadt</i> ,
Germany (M-real) | pulp, fine paper |
| 4. <i>Zanders Feinpapiere</i> ,
Germany (M-real) | fine paper |
| 5. <i>MD Papier</i> ,
Germany (Myllykoski) | magazine paper |
| 6. <i>Holzindustrie Schweighofer</i> ,
Austria (Stora Enso) | sawn goods |
| 7. <i>Stora Enso Corbehem</i> ,
France (Stora Enso) | magazine paper |
| 8. <i>Stora Enso Kabel</i> ,
Germany (Stora Enso) | magazine paper |
| 9. <i>Stora Enso Maxau</i> ,
Germany (Stora Enso) | newsprint,
magazine paper |
| 10. <i>Stora Enso Sachsen</i> ,
Germany (Stora Enso) | newsprint |
| 11. <i>Chapelle Darblay</i> ,
France (UPM-Kymmene) | newsprint |
| 12. <i>Nordland Papier</i> ,
Germany (UPM-Kymmene) | fine paper |
| 13. <i>Shotton Paper</i> ,
United Kingdom (UPM-Kymmene) | newsprint |



Stora Enso is a Finnish-Swedish company. Industrial plants of former Stora and MoDo Paper in Sweden are not marked. UPM-Kymmene informed on purchase of the German paper manufacturer Haindl in summer 2001.

Finnish exports of forest industry products to the European Union, 2000

	Sawn goods 1000 m ³	Plywood and veneer	Particle board	Fibre board 1000 m.t.	Wood Pulp	Paper and paperboard
Austria	112	27	-	-	19	147
Belgium-Luxemb.	109	18	-	3	53	701
Denmark	607	56	44	4	0	258
France	819	109	0	1	90	882
Germany	994	238	0	9	768	2 376
Greece	108	5	-	1	7	139
Ireland	196	11	2	1	2	52
Italy	235	59	-	1	104	463
Netherlands	652	169	-	9	40	557
Portugal	3	9	-	-	58	93
Spain	240	35	-	-	24	938
Sweden	39	112	12	6	100	296
United Kingdom	1 382	83	108	27	208	1 818
EU, total	5 497	932	167	62	1 471	8 722
% of total exports	65	85	82	90	86	70

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 1970, roundwood and forest-industries' products represented 56% of the value of the total exports of goods; their share was 27% in 2000. The same diversification of production is, of course, to be seen in the structure of the gross domestic product. In 1970, the share of forestry of the GDP was 6.3%, and that of basic forest industries, 6.7%. The corresponding figures for the year 2000 were 2.3% and 6.0%. In employment, forestry accounted for 4.1% and forest industries for 5.2% in 1970. In 2000, the corresponding figures were 1.0% and 3.1% 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, 2000

Gross domestic product

at market prices	FIM 782 876 million
at basic prices	FIM 680 383 million
of which forestry	2.3 %
forest industries	6.0 %

Total employment 2.34 million persons

of which forestry	1.0 %
forest industries	3.1 %

Total exports of goods FIM 294 221 million

of which forestry	0.2 %
forest industries	26.7 %

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 2000, the total value of forest-industries' products exports amounted to FIM 79 000 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, 1998–2000

Product	Unit 1 000	1998	1999	2000
Sawn goods ¹	m ³	12 300	12 770	13 400
Plywood	"	992	1 076	1 167
Particle board	"	455	439	462
Fibreboard	m.t.	100	96	100
Mechanical pulp	"	4 637	4 602	4 810
Chemical pulp	"	6 718	6 977	7 101
Pulp, total	"	11 355	11 579	11 910
Newsprint	"	1 483	1 490	1 394
Magazine paper	"	5 032	4 902	5 348
Fine paper	"	2 668	2 929	3 005
Kraft paper	"	451	504	528
Other paper	"	482	498	483
Paper, total	"	10 116	10 324	10 758
Paperboard	"	2 586	2 623	2 751
Paper and paperboard	"	12 703	12 947	13 509

¹ The 1998 figure is revised.

Source: Finnish Forest Industries Federation

Finnish forest industry exports, 1998–2000

Product	Unit 1 000	1998	1999	2000
Sawn goods	m ³	8 308	8 383	8 431
Plywood	"	832	939	1 006
Particle board	"	184	183	203
Fibreboard	m.t.	64	62	68
Mechanical pulp	"	88	99	96
Chemical pulp	"	1 546	1 783	1 585
Newsprint	"	1 199	1 223	1 144
Magazine paper	"	4 875	4 733	5 095
Fine paper	"	2 487	2 745	2 805
Kraft paper	"	312	361	375
Other paper	"	357	298	287
Paper, total	"	9 229	9 359	9 709
Paperboard	"	2 118	2 215	2 324
Converted paper products	"	408	386	394
Total paper and paperboard	"	11 755	11 960	12 427

Source: National Board of Customs

Value of Finnish forest industry exports, 2000

Country					FIM mill.
	Sawn goods	Wood-based panels, other wood products	Pulp	Paper, paper-board, converted products	Total
Austria	129	179	68	593	971
Belgium-Luxembourg	96	112	161	2 862	3 233
Denmark	645	383	0	1 092	2 120
France	862	388	335	3 928	5 514
Germany	1 100	1 515	2 887	9 817	15 321
Greece	109	48	25	525	706
Ireland	221	54	7	211	493
Italy	308	244	384	1 889	2 827
Netherlands	652	496	145	2 327	3 620
Portugal	3	36	220	346	606
Spain	243	202	85	3 584	4 117
Sweden	61	737	367	1 456	2 623
United Kingdom	1 698	862	828	8 298	11 686
EU total	6 127	5 254	5 524	36 932	53 837
Other Europe	266	1 303	467	5 788	7 823
Europe total	6 393	6 557	5 991	42 720	61 660
Asia	1 574	675	286	4 427	6 963
Africa	1 159	12	33	573	1 777
North America	102	268	54	4 456	4 879
Latin America	0	3	4	1 686	1 692
Oceania	6	46	1	1 127	1 180
Unspecified	-	-	-	466	466
Grand total	9 234	7 560	6 370	55 454	78 618

FIM 1.0 = EUR 0.17

FIM 1.0 = USD 0.16

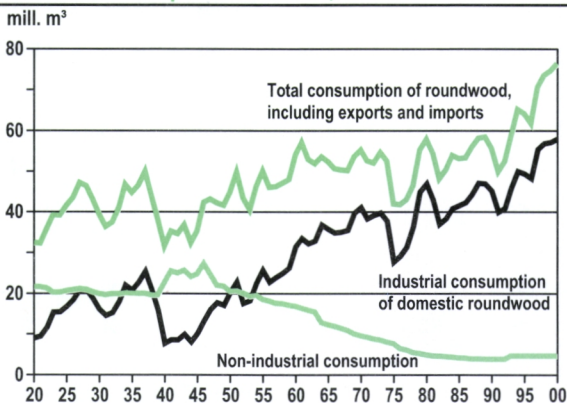
Source: National Board of Customs

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 since 1997 the consumption has 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 2000, total roundwood consumption reached 76.3 million m³, including imports and exports. Industrial wood consumption was 70.8 mill. m³. Imported roundwood (12.8 mill. m³) accounted for 18% of industrial wood consumption.

Roundwood consumption in Finland, 1920–2000



Non-industrial consumption does not include exports of roundwood.

Source: Finnish Forest Research Institute

Roundwood consumption during 5-year periods, 1985–99

Consumption category	1985–89	1990–94	mill. m ³ /yr 1995–99
Exports	1.3	1.0	1.0
Industrial roundwood	44.4	44.4	53.4
sawmills and panel industr.	20.3	20.0	27.1
pulp industries	24.1	24.4	26.3
Fuelwood and other	3.9	4.1	4.6
Domestic roundwood total	49.6	49.5	59.0
Imported wood (industries)	6.1	6.8	9.8
Total consumption	55.7	56.3	68.8

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, 1998–2000

Consumption category	1998	1999	mill. m ³ 2000
Total consumption in Finland	72.3	73.5	75.4
Pine	26.8	26.7	25.9
Spruce	28.1	28.9	30.7
Hardwood	16.6	17.0	17.8
Unspecified	0.8	0.9	1.0
Domestic roundwood	61.5	61.7	62.6
Pine	24.7	24.3	23.9
Spruce	27.1	27.4	28.5
Hardwood	9.7	10.0	10.2
Imported wood	10.8	11.7	12.8
Pine	2.1	2.3	2.1
Spruce	1.1	1.5	2.2
Hardwood	6.8	7.0	7.6
Unspecified	0.8	0.9	1.0
Exports, incl. poles	1.0	1.0	0.9
Pine	0.7	0.7	0.7
Spruce	0.2	0.2	0.1
Hardwood	0.1	0.1	0.1

*Pine: Pinus
sylvestris*

Spruce: Picea abies

*Hardwood: mainly
Betula sp.*

*'Unspecified'
consists of imported
wood chips and
residues.*

*Source: Finnish
Forest Research
Institute*

Wood consumption in sawmilling, plywood and pulp industries, 1998–2000

Year	Domestic roundwood		Imported wood	Sawmill chips	Total
	Conif.	Hardwood			
	Sawmilling				
1998	26.1	0.2	1.1	-	27.4
1999	26.4	0.2	1.8	-	28.4
2000	27.1	0.2	2.1	-	29.4
	Plywood and veneer industry				
1998	1.5	1.1	0.4	-	3.0
1999	1.6	1.0	0.6	-	3.2
2000	1.7	1.1	0.6	-	3.4
	Mechanical pulp industry				
1998	9.3	0.6	0.4	2.7	13.0
1999	9.0	0.7	0.4	2.7	12.8
2000	8.9	0.7	0.9	2.8	13.3
	Chemical pulp industry				
1998	12.8	4.7	8.8	8.7	35.1
1999	12.9	5.1	8.9	9.0	35.9
2000	12.8	5.1	9.2	9.1	36.2

Source: Finnish Forest Research Institute

Labour force

Efficient multi-function timber harvesters (nowadays numbering about 1500) 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 2000, 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 2000. However, the paper production has more than doubled during the same period. Consequently, forestry and forest industries, even during a boom, have no direct ameliorating effect on Finland's chronic unemployment problem (9.3% in June 2001).

Employment in forestry and forest industries, 1998–2000

	1998	1999	1 000 persons 2000
Forestry	24	23	24
Forest industries	72	72	72
Forest sector, total	96	95	96
Employment, total	2 222	2 296	2 335
Unemployed, total	285	261	253
Unemployment rate, %	11.4	10.2	9.8

Source: Statistics Finland

Employment in forest industries, 1998–2000

Branch of industry	1 000 persons		
	1998	1999	2000
Sawmilling	12	12	12
Plywood and veneer industry	5	5	6
Other board industries	1	1	1
Other wood-products industry ¹	13	14	15
Pulp industry	15	15	14
Paper industry	22	21	20
Paperboard industry	4	4	4
Forest industries, total	72	72	72

¹ Including carpentry products and pre-fabricated wooden houses.

Sources: Statistics Finland, Finnish Forest Research Institute

Commercial roundwood removals in 2000 amounted to record-high 55.9 million m³, of which 86% came from non-industrial, private forests. Fellings have been at a very high level during the last four years.

Logging in non-industrial, private forests is mainly carried out by the forest industries or by their wood-procurement organisations. In 2000, forest owners themselves carried out or organized the logging of 9.1 million m³, or 19% 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 levelled out, except for spruce logs, which continued to rise to the end of the year 2000. In the first half of 2001 the prices have slightly decreased.

Roundwood markets

Roundwood procurement and consumption in Finland, 2000

Sources	mill. m ³
Commercial roundwood	
from private-owned forests	48.0
from industry-owned forests	3.3
from state-owned forests	4.6
Non-commercial wood (priv. for.)	5.6
Domestic roundwood, total	61.5
Imported wood	12.8
Roundwood procurement, total	74.3
Consumption	
Sawmilling	29.4
Wood-based panels	3.5
Other wood-based products	0.3
Mechanical pulp industry	10.5
Chemical pulp industry	27.1
Industry, total	70.8
Fuelwood in dwellings	4.6
Exports of roundwood	0.9
Roundwood consumption, total	76.3

Imported wood is mostly birch pulpwood from Russia. In addition, sawmills furnished pulp industry with 11.9 mill. m³ of wood chips and residues.

Source: Finnish Forest Research Institute

Roundwood removals by ownership category, 1998–2000

Ownership category	1998	1999	mill. m ³ 2000
Private forests ¹	54.7	53.5	53.6
commercial	48.9	47.8	48.0
non-commercial	5.8	5.7	5.6
Forests industries	2.1	3.1	3.3
Forest and Park Service ²	4.1	4.4	4.6
Commercial, total	55.1	55.3	55.9
Grand total	61.0	61.0	61.5

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, 1998–2000

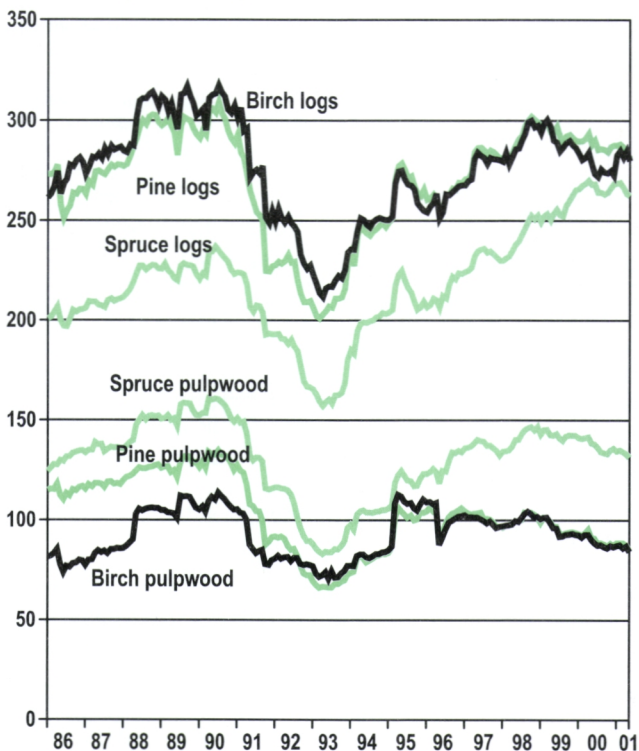
Roundwood assortment	1998	1999	mill. m ³ 2000
Logs	27.7	27.3	28.3
pine logs	10.9	10.4	10.9
spruce logs	15.4	15.6	16.0
hardwood logs	1.5	1.3	1.3
Pulpwood	27.3	28.0	27.6
pine pulpwood	12.1	12.5	12.4
spruce pulpwood	9.9	10.0	9.9
hardwood pulpwood	5.3	5.5	5.3
Commercial fuelwood ¹	0.1	0.0	0.0
Commercial removals, total	55.1	55.3	55.9
Non-commercial removals	5.8	5.7	5.6
Grand total	61.0	61.0	61.5

¹ only that purchased by industry.

Source: Finnish Forest Research Institute

Stumpage prices in non-industrial, private forestry, 1986–2001

FIM/m³ in May 2001 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 200 000 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 1 221 million (about USD 220 million) in 1999. Of the FIM 1 000 million spent in non-industrial, private forestry, forest owners' own financing or work accounted for 73%, and the rest was financed through state grants (27%).

Silvicultural and forest improvement work

Felling activities, 1998–1999

Type of felling	1 000 ha	
	1998	1999
Thinnings	284	292
Clear fellings	117	130
Seed-tree and shelterwood fellings	49	45
Removal of seed-tree and shelterwood	50	53
Other fellings	6	5
Total	507	525
% of forest area	2.2	2.3

Source: Finnish Forest Research Institute

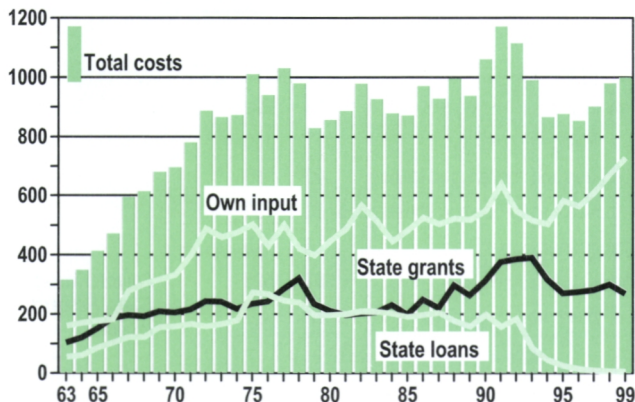
Silvicultural and forest improvement work, 1998–99

Type of work		1998	1999
Clearing of regeneration area	1000 ha	74	67
Soil preparation	"	121	120
Artificial regeneration	"	111	115
Seedling stand improvement	"	204	210
Forest fertilization	"	21	22
Drainage of mires	"	4	3
Maintenance of drainage	"	69	81
Construction of forest roads	km	1 676	1 858
Improvement of forest roads	"	1 172	1 377
Total costs	FIM mill.	1 167	1 221

Source: Finnish Forest Research Institute

Financing of silvicultural and forest-improvement works in non-industrial, private forests 1963–99

FIM mill. in 1999 money



Source: Finnish Forest Research Institute

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 in half on the 9th inventory, is 2 002 million m³. In recent years, the annual volume increment has exceeded the drain by about 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 47% and that of Norway spruce 34%, leaving 19% 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, 1.20 million hectares (5.2%) 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, 1992–2000

	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	2.8
Built-up areas	1.0
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, 1992–2000

	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	4.1
Recently drained mires	0.6
Transforming mires	2.9
Transformed mires	1.3
Total	8.9

Dominant tree species of forest stands, 1992–2000

		% ¹
Temporarily non-stocked		1.4
Scots pine	<i>Pinus sylvestris</i>	64.7
Norway spruce	<i>Picea abies</i>	24.0
Other coniferous		0.1
Silver birch	<i>Betula pendula</i>	2.5
Downy birch	<i>Betula pubescens</i>	6.5
Aspen	<i>Populus tremula</i>	0.3
Alder	<i>Alnus sp.</i>	0.4
Other broadleaves		0.0
Total		100.0
Forest land area	(mill. ha)	20.1

¹ of forest land area.
Note that of volume, share of the broadleaved species is much greater.

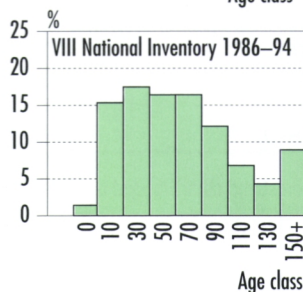
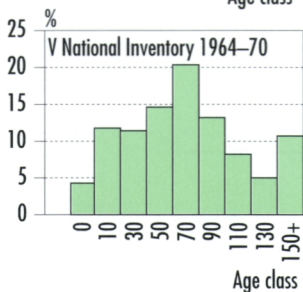
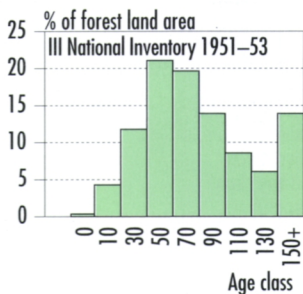
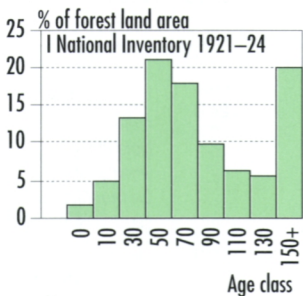
Source: Finnish Forest Research Institute

Timber resources in Finland, 1992–2000

Forest and other wooded land	mill. ha	23.0
Growing stock volume	mill. m ³	2 002
Scots pine	"	939
Norway spruce	"	687
Birch	"	305
Other broadleaves	"	71
Volume increment	mill.m ³ /yr	79.4
Scots pine	"	35.0
Norway spruce	"	26.2
Birch	"	13.9
Other broadleaves	"	4.3

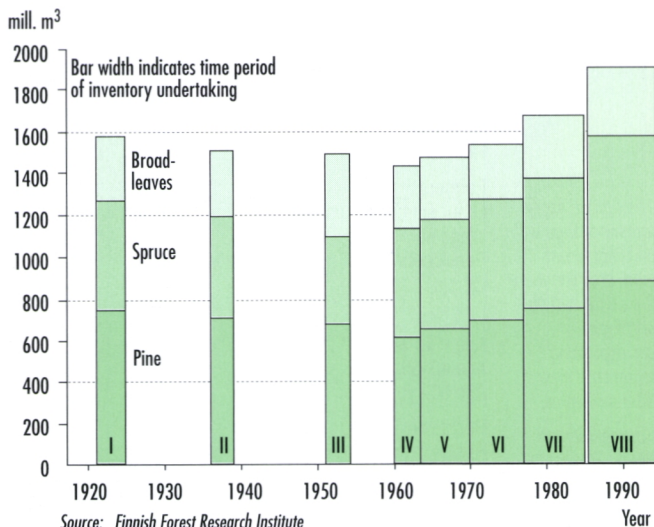
Source: Finnish Forest Research Institute

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, 1992–2000

Ownership category	Forest land mill. ha	Forestry land mill. ha	%
Non-indust., private	12.3	14.1	53.7
Industrial, private	1.8	2.0	7.8
State	4.9	8.8	33.4
Other public	1.1	1.4	5.1
Total	20.1	26.3	100.0

Source: Finnish Forest Research Institute

Non-industrial private ownership of forests, 1999

Ownership group	%	
	On holdings/ owners	On forest land area
Family ownership	75	76
Group ownership	11	12
Heirs ownership	14	12
Farmers	19	29
Other entrepreneurs	6	6
Wage earners	32	27
Pensioners	38	34
Others	5	4
Age < 40 years	10	11
Age 40–59 years	44	46
Age 60+ years	46	43
Reside on holding	46	56
Reside in the same municipality	18	15
Reside elsewhere	36	29

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 12.3 million ha.

Source: Finnish Forest Research Institute

Growing stock volume by ownership category, 1992–2000

Ownership category	Scots pine	Norway spruce	Broad-leaves	mill. m ³	
				Total	%
Non-indust., private	575	522	271	1 368	68.3
Industrial, private	93	49	26	169	8.4
State	216	81	57	354	17.7
Other public	55	35	21	111	5.5
Total	939	687	376	2 002	100.0

Source: Finnish Forest Research Institute

Annual volume increment by ownership category, 1992–2000

Ownership category	Scots pine	Norway spruce	Broad-leaves	mill. m ³ /yr	
				Total	%
Non-indust., private	22.0	20.7	14.0	56.6	71.3
Industrial, private	4.4	2.1	1.4	7.9	9.9
State	6.5	2.2	1.9	10.6	13.3
Other public	2.1	1.3	1.0	4.3	5.5
Total	35.0	26.2	18.2	79.4	100.0

Source: Finnish Forest Research Institute

Mean growing stock volume and annual increment by ownership category, 1992–2000

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	110	4.5	4.1
Industrial, private	93	4.3	4.6
State	66	2.0	3.0
Other public	101	4.0	4.0
Total	97	3.9	4.0

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

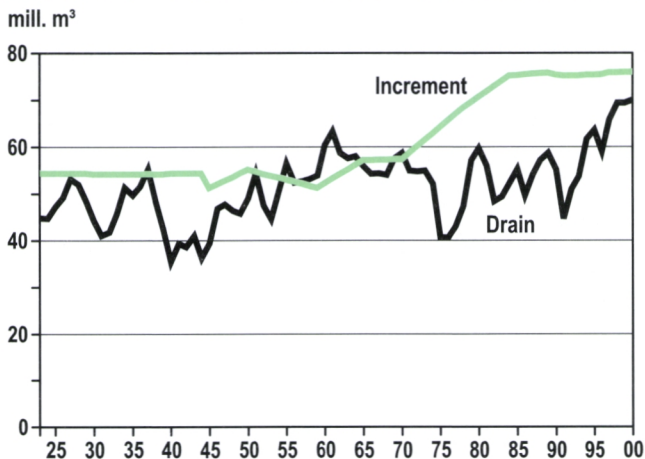
Increments for 1995–99 are forecasts.

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 1995–99
Scots pine	I	32.2	33.3	33.1
	D	20.9	20.0	25.1
Norway spruce	I	26.9	25.2	25.7
	D	21.9	22.3	27.8
Broadleaves	I	16.5	16.8	17.0
	D	12.1	11.0	12.5
Total	I	75.6	75.3	75.8
	D	54.9	53.2	65.4

Growing stock increment and drain, 1923–2000



Multiple-use production of forests, 1998–2000

Product		1998	1999	2000
Commercial roundwood	mill. m ³ o.b.	55	55	56
Non-commercial roundwood	mill. m ³ o.b.	6	6	6
Commercial forest berries	m.t. ¹	8 441	5 722	5 806
Commercial forest mushrooms	m.t. ¹	1 408	195	982
Lichen picked for exporting	m.t.	311	313	314
Deer venison	m.t.	4 329	6 840	9 015
Hare venison	m.t.	975	797	662
Forest game birds	m.t.	157	258	184
Fur-bearing animals	1000 indiv.	237	254	275
Reindeer meat production	m.t.	2 000	2 200	..

¹ Quantities offered for sale, in metric tons.

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

Forest condition in Finland, 1992–2000

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	19.0
Total	23.4

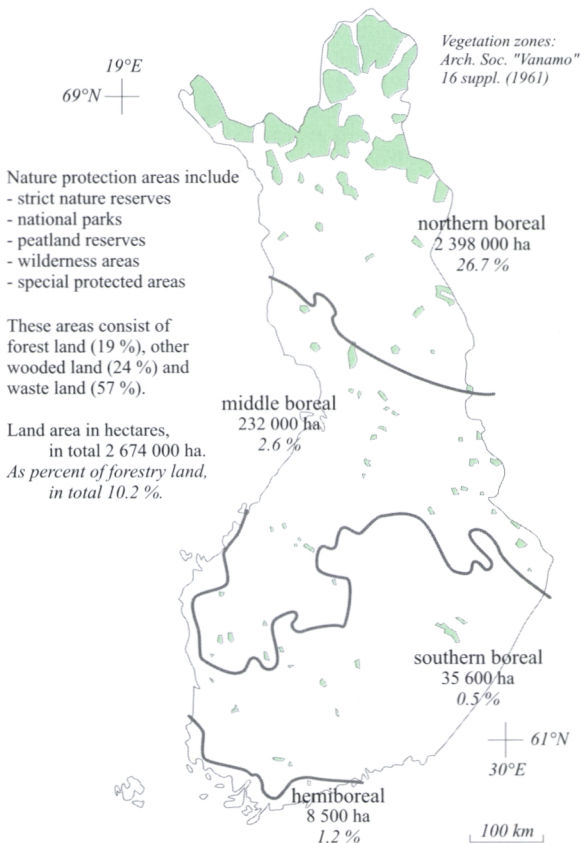
Damaging agents

	Natural competition	1.4
	Climatic factors	5.7
	Harvesting damage	1.1
	Moose	1.5
	Voles	0.0
	Insects	0.3
	Fungi	6.2
	Unidentified	7.2
	Total	23.4

*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 (1999)

KEY CONTACTS IN FINNISH FOREST RESEARCH

FINNISH FOREST RESEARCH INSTITUTE

(Metsäntutkimuslaitos, METLA)

- **Vantaa Research Centre, Helsinki Unit**

Unioninkatu 40 A

FIN-00170 Helsinki, Finland

Tel. +358 9 857 051, fax +358 9 625 308

Website: www.metla.fi

(Forest Resources and Economics, Administration)

- **Vantaa Research Centre, Vantaa Unit**

Jokiniemenkuja 1

FIN-01300 Vantaa, Finland

Tel. +358 9 857 051, fax +358 9 8570 5569

(Forest Ecology and Production)

- **Joensuu Research Centre**

Yliopistokatu 7

FIN-80100 Joensuu, Finland

Tel. +358 13 251 4000, fax +358 13 251 4111

(Silviculture and Forest Management)

Research Stations of the Finnish Forest Research Institute:

- **Kannus Research Station**

P.O. Box 44

FIN-69101 Kannus, Finland

Tel. +358 6 874 3211, fax +358 6 874 3201

(Peatland Forestry, Bioenergy)

- **Kolari Research Station**

FIN-95900 Kolari, Finland

Tel. +358 16 561 401, fax +358 16 561 904

(Timberline research)

● **Muhos Research Station**

Kirkkosaarentie 7
FIN-91500 Muhos, Finland
Tel. +358 8 531 2200, fax +358 8 531 2211
(Forest Condition, Forest Regeneration)

● **Parkano Research Station**

Kaironiementie 54
FIN-39700 Parkano, Finland
Tel. +358 3 44 351, fax +358 3 443 5200
(Peatland Forestry, Forest Regeneration)

● **Punkaharju Research Station**

Finlandiantie 18
FIN-58450 Punkaharju, Finland
Tel. +358 15 730 220, fax +358 15 644 333
(Forest Genetics)

● **Rovaniemi Research Station**

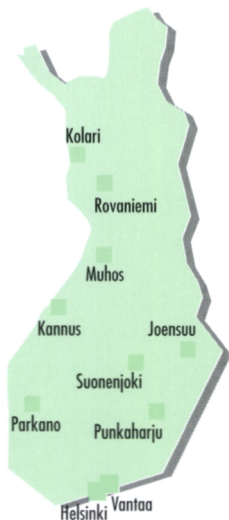
Eteläranta 55
FIN-96300 Rovaniemi, Finland
Tel. +358 16 336 411, fax +358 16 336 4640
(Forest Condition, Forest Regeneration)

● **Suonenjoki Research Station**

Juntintie 40
FIN-77600 Suonenjoki, Finland
Tel. +358 17 513 811, fax +358 17 513 068
(Ecophysiology, Regeneration Research)

European Forest Institute

Torikatu 34
FIN-80100 Joensuu, Finland
Tel. +358 13 252 020, fax +358 13 124 393
Website: www.efi.fi
(Independent, Non-governmental Research Unit)



Finnish Game and Fisheries Research Institute

(Riista- ja kalatalouden tutkimuslaitos)
Pukinmäenaukio 4
FIN-00720 Helsinki, Finland
Tel. +358 205 7511 , fax +358 205 751 201
Website: www.rkti.fi

Finnish Pulp and Paper Research Institute (KCL)

(Keskuslaboratorio)
Tekniikantie 2
FIN-02150 Espoo, Finland
Tel. +358 9 43 711 , fax +358 9 464 305
Website: www.kcl.fi
(Owned by paper industry)

Finnish Society of Forest Science

(Suomen Metsätieteellinen Seura)
Unioninkatu 40 A
FIN-00170 Helsinki, Finland
Tel. +358 9 8570 5235, fax +358 9 8570 5677
Website: www.metla.fi/org/sms

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

Silva Fennica is a peer-reviewed international journal of forest science. 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. In 2000, the other scientific journal, *Acta Forestalia Fennica*, was amalgamated into *Silva Fennica*. The scope of *Silva Fennica* was broadened, so that *Silva* now publishes more extensive papers as *Silva Fennica Monographs*.

Editorial office:

METLA/ Editorial Office
Unioninkatu 40 A,
FIN-00170 Helsinki, Finland
Tel. +358 9 857 051, fax +358 9 625 308
Website: www.metla.fi/silvafennica

Metsäteho

Unioninkatu 17
FIN-00130 Helsinki, Finland
Tel. +358 9 132 521, fax +358 9 659 202
Website: www.metsateho.fi
(R&D Unit for Timber Procurement and Production,
mainly owned by Forest Industries)

University of Helsinki

Faculty of Agriculture and Forestry
Forestry Departments
Latokartanonkaari 7
FIN-00710 Helsinki, Finland
Tel. +358 9 1911

Viikki Science Library of Helsinki University

(Applied biosciences)
Viikinkaari 11 A
FIN-00710 Helsinki, Finland
Tel. +358 9 191 58028, fax +358 9 191 58011
Website: www.tiedekirjasto.helsinki.fi

University of Joensuu

Faculty of Forestry
Yliopistokatu 7
FIN-80100 Joensuu, Finland
Tel. +358 13 251 111, fax +358 13 2513 590
Website: gis.joensuu.fi

TTS Work Efficiency Institute

(Työtehoseura)
Melkonkatu 16 A
FIN-00210 Helsinki, Finland
Tel. +358 9 2904 1200, fax +358 9 6922 084
Website: www.tts.fi
(Small-scale forestry, Forest work)

Other useful contacts

Ministry of Agriculture and Forestry

(Maa- ja metsätalousministeriö)
Hallituskatu 3 A
FIN-00170 Helsinki, Finland
Tel. +358 9 1601, fax +358 9 1602 190

Ministry of the Environment

(Ympäristöministeriö)
Kasarmikatu 25
FIN-00130 Helsinki, Finland
Tel. +358 9 19 911, fax +358 9 1991 9545
Website: www.vyh.fi

Finnish Environment Institute

(Suomen ympäristökeskus)
Kesäkatu 6
FIN-00260 Helsinki, Finland
Tel. +358 9 403 000, fax +358 9 4030 0190
Website: www.vyh.fi
(Governmental expert management of environment)

Finnish Forest and Park Service

(Metsähallitus)
Vernissakatu 4
FIN-01300 Vantaa, Finland
Tel. +358 205 64100
Website: www.metsa.fi
(State-owned enterprise managing most of state forests)

Forestry Development Centre Tapio

(Metsätalouden kehittämiskeskus Tapio)
Soidinkuja 4
FIN-00700 Helsinki, Finland
Tel. +358 9 15 621, fax +358 9 1562 232
Website: www.tapio.net
(Provides expertise particularly for private forestry)

MTK Forestry Group

(MTK, Metsäryhmä)

Simonkatu 6

FIN-00100 Helsinki, Finland

Tel. +358 9 131 151, fax +358 9 1311 5403

Website: www.mtk.fi

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

Finnish Forest Industries Federation

(Metsäteollisuus ry)

Snellmaninkatu 13

FIN-00170 Helsinki, Finland

Tel. +358 9 13 261, fax +358 9 132 4445

Website: www.forestindustries.fi

Finnish Forestry Association

(Suomen Metsäyhdistys)

Salomonkatu 17 B

FIN-00100 Helsinki, Finland

Tel. +358 9 685 0880, fax +358 9 6850 8820

Website: www.smy.fi

(Joint association for those related to forestry and forest industries)

Statistics Finland

(Tilastokeskus)

Työpajakatu 13

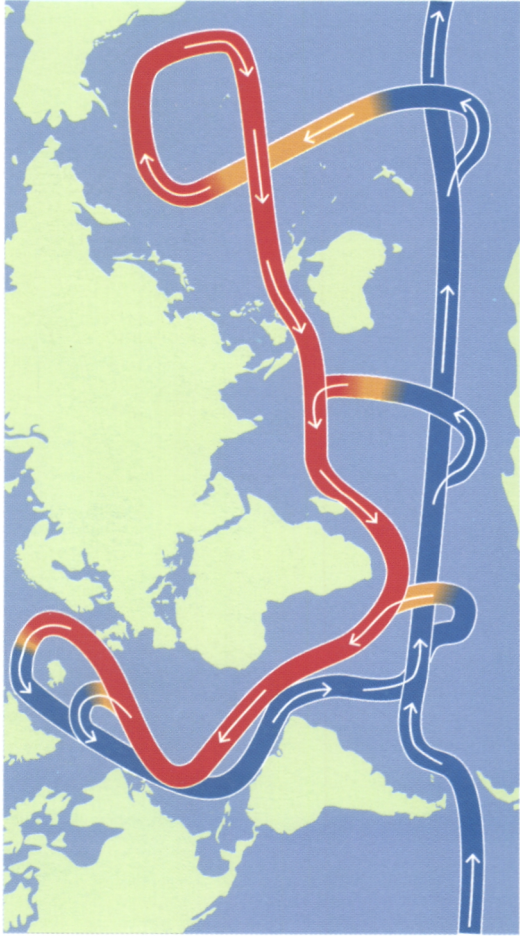
FIN-00580 Helsinki, Finland

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

Website: www.stat.fi

Source: Finnish Forestry Association

Schematic showing the global ocean circulation which carries heat to northern Europe



Source: The Global Ocean Observing System, Publication No. 42 (1998)