Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT

COUNTRY REPORTS

FINLAND

FRA2005/054
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The Forest Resources Assessment Programme

Sustainably managed forests have multiple environmental and socio-economic functions important at the global, national and local scales, and play a vital part in sustainable development. Reliable and up-to-date information on the state of forest resources - not only on area and area change, but also on such variables as growing stock, wood and non-wood products, carbon, protected areas, use of forests for recreation and other services, biological diversity and forests' contribution to national economies - is crucial to support decision-making for policies and programmes in forestry and sustainable development at all levels.

FAO, at the request of its member countries, regularly monitors the world's forests and their management and uses through the Forest Resources Assessment Programme. This country report forms part of the Global Forest Resources Assessment 2005 (FRA 2005), which is the most comprehensive assessment to date. More than 800 people have been involved, including 172 national correspondents and their colleagues, an Advisory Group, international experts, FAO staff, consultants and volunteers. Information has been collated from 229 countries and territories for three points in time: 1990, 2000 and 2005.

The reporting framework for FRA 2005 is based on the thematic elements of sustainable forest management acknowledged in intergovernmental forest-related fora and includes more than 40 variables related to the extent, condition, uses and values of forest resources. More information on the FRA 2005 process and the results - including all the country reports - is available on the FRA 2005 Web site (www.fao.org/forestry/fra2005).

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Introduction

The most important data source for FRA 2005 is the Finnish National Forest Inventory (NFI) at the Finnish Forest Research Institute (Metla). Another significant information source for FRA 2005 is the official Finnish forestry statistics (at Metla). It collects information from several sources, in addition to NFI, from other units of Metla, Finnish Forest and Park Service, Finnish Forest Industries, Finnish Ministry of Environment and from other research institutes, e.g., Finnish Game and Fisheries Research Institute.

National Forest Inventory of Finland

The National Forest Inventory of Finland (METLA) has produced large-area forest resource information since 1921. So far (2004), 9 inventories have been completed (1:1921-1924, 2:1936-38, 3:1951-53, 4:1960-63, 5:1964-70, 6:1971-76, 7:1977-84, 8:1986-1994, 9:1996-2003). The tenth inventory began in 2004. The entire country will be covered each year in this new system through measuring annually one fifth of the plots of the entire plot grid. Since 1990, the NFI has applied the multi-source forest inventory method which combines information from field measurements with satellite images and other numeric data sources and produces statistics for small areas. All NFI results in this report come from the field data based inventory. The traditional role of the NFI has been to produce objective and up-to-date information on the Finland's forests resources, forest health conditions, forest biodiversity, forest carbon pools and their development for national and regional decision making.

The number of field plots in the entire country in one inventory since 1964 has been about 85 000 on land and about 70 000 on forestry land. Field plots cover all land use classes. The plot density in the country is adapted to the variability of forests. About one fifth of the field plots have been measured as permanent since 1992. PPS sampling is applied in picking-up the tallied trees using a basal area factor of 2 (Southern part of the country) and 1.5 (Northern part of the country). FAO FRA land use class definitions have been applied in the field measurements since 1998, simultaneously with the national definitions.

The estimates of the NFI are (asymptotically) unbiased (based on ratio estimators). The sampling errors are presented in the inventory reports for regions (forestry centres) and for the entire country. Measurement errors and model errors have not been taken into account but are considered to be distributed with zero mean. The inventory is generally considered to be able to produce high quality information.

National Data and Reclassification

The information collected in the National Forest Inventory is stored into a database. Inventory results are published by regions and for the entire country in the specific publications and in the Finnish Statistical Yearbook of Forestry. National and international statistics are calculated for different purposes on the basis of definitions and requirements.

For the FRA 2005 reporting, there was no need for reclassification for 2000 and 2005 data due to the fact that FAO FRA definitions are applied in the field, parallel with national classifications. A reclassification was applied to 1990 data in area and growing stock tables (T1-T7 and T10).

The Finnish Forest Research Institute (METLA)

Metla (Finnish Forest Research Institute) is an impartial state research institute, founded in 1917. Metla is subordinated to the Ministry of Agriculture and Forestry. Research work has been organised into about 230 projects. Primary research problems have combined under problem-oriented research programmes, e.g. National Forest Inventory. There are six programmes going on in the year 2005.

Metla's mission is to promote, through research, the ecologically, economically and socially sustainable development of the forests and forestry. Metla conducts research and generates research information about the forest nature and environment, the different uses of forests, and about forestry and the forest cluster. Metla's activities are characterised by customer- and problem-orientation. Metla has a staff of about 900 people, 330 of these being researchers.

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1 Table T1 – Extent of Forest and Other wooded land

1.1 FRA 2005 Categories and definitions

Category	Definition
Forest	Land spanning more than 0.5 hectares with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds *in situ*. It does not include land that is predominantly under agricultural or urban land use.
Other wooded land	Land not classified as "Forest", spanning more than 0.5 hectares; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds *in situ*; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.
Other land	All land that is not classified as "Forest" or "Other wooded land".
Other land with tree cover (Subordinated to "Other land")	Land classified as "Other land", spanning more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 meters at maturity.
Inland water bodies	Inland water bodies generally include major rivers, lakes and water reservoirs.

1.2 National data

1.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish National Forest Inventory (NFI). Finnish Forest Research Institute.	H	Forest, Other wooded land, Other land, Other land with tree cover	2000: 1996-2003 2005: Forecast	The NFI9data permit direct calculation of data according to the FRA categories and definitions for 2000 and 2005. Calibration to FRA categories for 1990 data applying 1996-2003 NFI data.
Finnish National Forest Inventory (NFI). Finnish Forest Research Institute.	H	forest land, scrub land, waste land, other forestry land, agricultural land, build up land, traffic lines, power lines	1990: 1986-1994	Reclassification to FRA categories for 1990 data applying 1996-2003 NFI9 data and the distribution of national classes in NFI9 data into FRA categories.
NATIONAL LAND SURVEY OF FINLAND. SUOMEN PINTA-ALA KUNNITTAIN.	H	Land area, Inland water bodies	1990: 1.1. 1990 2000: 1.1. 2004 2005: 1.1.2004	Areas of inland waters by municipalities.

1.2.2 Classification and definitions

Information generated from the NFI9 data base to match FRA2005 definitions. On the table below, the definitions used to extract the national data for years 2000 and 2005, according to FRA2005 categories when different from FRA2005.

National class	**Definition**
Forest	Information generated from NFI data base. The FRA2005 definition is " Land spanning more than 0.5 hectares...". Finland uses a minimum area of "more than 0.25 ha..." and does not consider the width of the area. It is only defined that the shape of forest land is such that it can be considered *forestry land**. **Finnish definition.*
Other wooded land	Information generated from NFI data base. The FRA2005 definition is " Land not classified as "Forest", spanning more than 0.5 hectares...". Finland uses a minimum area of 0.25 ha and does not consider the width of the area. It is only defined that the shape of forest land is such that it can be considered *forestry land**. **Finnish definition.*
Other land	According to used FRA 2005 definition.
Other land with tree cover	Information generated from NFI data base. The FRA2005 definition is " Land classified as "Other land", spanning more than 0.5 hectares with a canopy cover of more than 10 percent of trees able to reach a height of 5 metres at maturity." Finland will use instead: a parcel with growing stock not belonging to *forestry land**, e.g., a building site. The size of the land area can be less than 0.5 ha. **Finnish definition.*
Inland water bodies	According to used FRA 2005 definition.

On the table below the definitions to extract the national data for year 1990 to be reclassified to FRA 2005 categories. National land use classes express the land use from the forestry point of view.

National class	**Definition**
forest land	Potential land used for timber production; potential mean annual increment under rotation at least 1m^3/ha, minimum area 0.25 ha.
scrub land	Land where the potential mean annual increment is from 0.1 to 1m^3/ha, minimum area 0.25 ha.
waste land	Waste land is a domain of forestry where the potential mean annual increment if less than 0.1m^3/ha, minimum area 0.25 ha.
other forestry land	Other forestry land i.e. forestry roads, forest depots and camp lots, small gravel pits etc., minimum area 0.25 ha.
other land	agricultural land, build up land, traffic lines, power lines
fresh water	
SALT WATER	

1.2.3 Original data

Original national data for the reference years 2000 and 2005 are extracted according to FRA 2005 categories and definitions and originates from NFI9 from years 1996-2003.

FRA 2005 Classes	Area (1000 hectares) NFI9 (1996-2003)
Forest	22486
Other wooded land	826
Other land	7136
... of which with tree cover	177
TOTAL LAND AREA	30447

Original national data for the reference year 1990 is extracted according national categories and definitions.

National classes	Area (1000 hectares) NFI8 (1986-1994)
forest land	20074
scrub land	2983
waste land	3093
other forestry land	151
other land	4158
Total land area	30459

1.3 Analysis and processing of national data

1.3.1 Calibration

NFIs have progressed by regions wherefore land areas for different regions have been from different years. The land area of the entire country has been calibrated to the reference years 1990 and 2000 after estimation, forecasting and reclassification. The land area by Forestry centres obtained from the National Land Survey of Finland on 1.1.1990 have been used for 1990, and land areas on 1.1.2004 for 2000 and 2005. The land area from the National Land Survey of Finland on 1.1.2004 is used because a significant error in the land area statistics was discovered in the 1.1.2000 land areas.

National classes	1990	2000	2005
Land area Total on national data	30459.2	30447.4	30447.4
Land area -Total of national data, after calibration to 1.1.1990, 1.1.2000 and 1.1.2004 land areas	30459.2	30447.3	30447.3
National calibration factor	1.000000	0.999997	0.999997
Land Area - UN statistical div.	30459	30459	30459
Calibration factor	-	-	-

1.3.2 Estimation and forecasting

No estimation was used for the 1990 data, since the original national data was used from years 1986-1994. For 2000, land use transition matrices were estimated and applied separately for the set of field plots measured each year. The transitions were based on recorded land use class changes during the period from 1990 to the specific inventory year in the NFI9. For 2000, forecasting was done for 1996-1999 field plot data, none for 2000 field plot data and forecasting (backwards) for the 2001-2003 field plot data. For 2005, forecasting was done for the 1996-2003 NFI field plot data applying the above land use transition matrices per inventory year.

Example: Transition matrix for the 1999 field plots of NFI9, 1000 ha.

	1990	Forest	OWL	OL	OLWTC[1]	water	**1999**
Forest	2356.4		1.8	15.8	0	0	2359.3
OWL	8.2	0.3		0.2	0	0	6.4
OL	637.4	11.7	0.5		0	0	633.6
OLWTC[1]	27.6	2.7	0	0		0	30.3
water	0	0	0	0	0		0
Total area	3029.6	14.7	2.3	16.0	0	0	3029.5

1) OLWTC = Other land with tree cover, not included in OL here.

FRA 2005 Classes	**Land use classes for 2000 and 2005 before calibration of total land area**		
	Original NFI9-data	**2000**	**2005**
	Area (1000 hectares)		
Forest	22485.8	22475.1	22500.0
Other wooded land	825.8	829.8	802.3
Other land	7135.8	7142.4	7145.2

1.4 Reclassification into FRA 2005 classes

In NFI9, both FRA definitions and national definitions were applied parallel. This relationship was applied in reclassification of 1990 data. In order to make the 1990 national data fit the FRA2005 categories, the national land use classes forest and scrubland were multiplied with the ratios of (FRA class NFI9)/(National class NFI9) which were 1.1056 and 0.3093 respectively. The other land was the remaining land area. With these ratios applied to national classes, the following areas for the FRA classes for 1990 were obtained.

Result of reclassification for 1990

National classes	**1000 ha**				
		Forest	**OWL[1]**	**Other land**	**OLWTC[2]**
forest land	20074	20074	0	0	NDA
scrub land	2983	1969	923	91	NDA
waste land	3093	0	0	3093	NDA
other forestry land	151	151	0	0	NDA
other land	4158	0	0	4158	NDA
Total	**30459**	**22194**	**923**	**7342**	NDA

1) OWL = Other wooded land
2) OLWTC = Other land with tree cover

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Forest	22194	22475	22500
Other wooded land	923	830	802
Other land	7342	7142	7145
...of which with tree cover [1)]	177	177	177
Inland water bodies	3355	3367	3367
TOTAL	**33814**	**33814**	**33814**

1) Area of “Other land with tree cover” is included in the area reported under “Other land” and is therefore excluded when calculating the total area for the country. Original NFI9 result for "Other land with tree cover" is used for all time points 1990, 2000 and 2005.

1.6 Comments to National reporting table T1

Comment on the trends

The land area of Finland is still slightly increasing due to the postglacial crustal uplift. On the other hand, the construction of artificial lakes for generating hydro power has decreased the land area during the past 50 years. The land area of Finland is thus not constant. Furthermore, a significant error was discovered in the land area statistics on 1.1.2000, maintained by the National Land Survey of Finland. This erroneous area (30 459, 1000 ha) is also in the records by FAOSTAT. These are the reasons that the official land area by the National Land Survey of Finland on 1.1. 2004 (30 447.4, 1000 ha) is used in this report, instead of that by FAOSTAT.

The Forest area in Finland has increased during the past 50 years mainly due to peatland drainage and to some extent due to afforestation of low productive and abandoned farm land. Large areas of Other land and Other wooded land has been converted to Forest land by draining mires and open fens and bogs (by lowering groundwater level). An intensive drainage operation began in late 1950's and lasted until the mid of 1970's. Still minor areas drained Other Wood land and Other land areas are changing to Forest land in North Finland. The increase of the total Forest area due to peatland drainage operation has been estimated to be about 1.6 mill ha when using national definitions, and somewhat more when using FRA definitions. This increase has continued until today, and is expected to continue but the speed is expected to decrease. The mean annual increase between 1990 and 2000 was 28 100 ha, and has been estimated to be 5000 ha between 2000 and 2005 when using land use transitions noticed in NFI9. One should note that the average annual increase in FL, estimated and reported for FRA 2000 between 1990 and 2000, was 8000 ha. The reason for the difference is that more accurate data are available for FRA 2005. The data with FRA 2000 FL definition, applied in the field, were available only for a part of the country, not for instance for that part (North and North Central Finland) in which the most significant land use changes have taken and still take place.

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2 Table T2 – Ownership of Forest and Other wooded land

2.1 FRA 2005 Categories and definitions

Category	Definition
Private ownership	Land owned by individuals, families, private co-operatives, corporations, industries, religious and educational institutions, pension or investment funds, and other private institutions.
Public ownership	Land owned by the State (national, state and regional governments) or government-owned institutions or corporations or other public bodies including cities, municipalities, villages and communes.
Other ownership	Land that is not classified either as "Public ownership" or as "Private ownership".

2.2 National data

2.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish National Forest Inventory (NFI). Finnish Forest Research Institute.	H	Private ownership, Public ownership and Other ownership.	1990: 1986-1994 2000: 1996-2003	The NFI data permit direct calculation of data according to the FRA categories and definitions for 2000. Reclassification of national land use classes to FRA 2005 categories for 1990 data applying 1996-2003 NFI9 data as in T1. Ownership data for the NFI field plots is obtained from National Land Survey Of Finland. Cadastral Register and Finnish Tax Administration databases.

2.2.2 Classification and definitions

Information generated from NFI data base to match FRA2005 definitions. On the table below the definitions used to extract the national data according to FRA2005 categories.

Class	Definition used
Private ownership	Information generated from NFI data base. Finland will use "Land owned by individuals, families, private co-operatives, corporations, industries, educational institutions, pension or investment funds, and other private institutions." The religious institutions are considered public ownership since they are public bodies with rights to taxation.
Public ownership	Information generated from NFI data base. Finland will use "Land owned by the State (national, state and regional governments) or government-owned institutions or corporations or other public bodies including cities, municipalities, villages, communes and religious institutions."
Other ownership	According to used FRA 2005 definition.

2.2.3 Original data

Original national data for the reference years is extracted according to FRA 2005 categories and definitions.

Ownership	Area (1000 hectares)			
	NFI8 (1986-1994)		NFI9 (1996-2003)	
	Forest land	Scrub land	Forest	OWL
1. Under public ownership	14444	1306	15237	256
2. Under private ownership	5627	1677	7223	570
3. Under other or unspecified ownership	3	1	26	1
Total for country	**20074**	**2983**	**22486**	**826**

2.3 Analysis and processing of national data

2.3.1 Calibration

The calibration of land area is done as for T1.

2.3.2 Estimation and forecasting

Estimation and forecasting is done for forest and OWL, year 2000, as presented in 2.3.2 for T1.

2.4 Reclassification into FRA 2005 classes

Reclassification is done for forest and OWL, year 1990, as presented in 2.4. for T1.

2.5 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	15969	15230	404	257
Public ownership	6222	7219	519	572
Other ownership	3	26	0	1
TOTAL	**22194**	**22475**	**923**	**830**

2.6 Comments to National reporting table T2

The religious institutions are considered to belong to category public ownership since they are public bodies with rights to taxation.

3 Table T3 – Designated function of Forest and Other wooded land

3.1 FRA 2005 Categories and definitions

Types of designation

Category	Definition
Primary function	A designated function is considered to be primary when it is significantly more important than other functions. This includes areas that are legally or voluntarily set aside for specific purposes.
Total area with function	Total area where a specific function has been designated, regardless whether it is primary or not.

Designation categories

Category / Designated function	Definition
Production	Forest / Other wooded land designated for production and extraction of forest goods, including both wood and non-wood forest products.
Protection of soil and water	Forest / Other wooded land designated for protection of soil and water.
Conservation of biodiversity	Forest / Other wooded land designated for conservation of biological diversity.
Social services	Forest / Other wooded land designated for the provision of social services.
Multiple purpose	Forest / Other wooded land designated to any combination of: production of goods, protection of soil and water, conservation of biodiversity and provision of social services and where none of these alone can be considered as being significantly more important than the others.
No or unknown function	Forest / Other wooded land for which a specific function has not been designated or where designated function is unknown.

3.2 National data

3.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish National Forest Inventory (NFI). Finnish Forest Research Institute.	H	Designated functions	1990: 1986-1994 2000: 1996-2003 2005: Forecast	The NFI data permit direct calculation of data according to the FRA categories and definitions. Reclassification of national land use classes to FRA 2005 categories for 1990 data applying 1996-2003 NFI9 data as in T1.

3.2.2 Classification and definitions

A somewhat different terms and definitions were applied on one hand to 2000 and 2005 data and on the other hand to 1990. The applied definitions are given in the two tables below.

The definitions used to extract the national data for years 2000 and 2005, according to FRA2005 categories.

Class	**Definition**
Production	Areas with no restrictions "Luonnonhoitometsä"-areas with restricted silviculture Forests of military forces "Yksittäiset suojeluohjelmat" -single conservation programme areas Area restricted by regional or local land use planning Minor restrictions proposed by field crew leader
Protection of soil and water	
Conservation of biodiversity	National parks Strict nature reserves Mire conservation area Protected herb-rich forest areas Other nature reserves based on law Protected old-growth forest areas Wilderness reserves, strictly protected zones "Aarnialue", area protected, based on decision by the authority responsible of management "Luonnonhoitometsä", nature conservation forest, managed only to retain the habitat features Mires where drainage is prohibited Nature reserves of military forces Areas under the national parks and strict nature reserves development proramme Areas under the mire conservation programme Areas under the Herb-rich forests conservation programme Areas under the old-growth natural forests conservation programme Shoreline areas conservation programme Waterfowl habitats conservation programme Protected Areas for species needing special protection Areas under the solid rock conservation programme Habitats of particular significance mentioned in the Forest Act except: solid rock OWL, sphagnaceous mires, open bogs, mires affected by surface water, rock material
Social services	Routes for recreation National hiking areas Archaeological remains Research forests and forests of seed stands
Multiple purpose	Wilderness reserves, nature-imitating management zones "Luonnonhoitometsä", nature conservation forest, zones of restricted management Park forests Municipal near-recreation areas Other areas of special activities Single conservation programmes Areas under the Glacifluvial Esker formations conservation programme
No or unknown function	

The definitions used to extract the national data for year 1990, according to FRA2005 categories.

Class	**Definition**
Production	No multiple use restrictions Area restricted by regional or local land use planning **COASTAL AREAS IN LAND USE PLANNING** Minor restrictions proposed by field crew leader **AREAS WITH TEMPORAL CUTTING RESTRICTIONS (NORTHERN FINLAND)**
Protection of soil and water	
Conservation of biodiversity	Strict nature reserve National park Nature reserves based on decision by the authority responsible of management Peatland reserves Areas under the mire conservation programme Mires where drainage is prohibited Wilderness reserves, strictly protected zones (northern Finland) Areas which have been decided to be protected but the protection hasn't yet been put into effect (northern Finland)
Social services	
Multiple purpose	Wilderness reserves, nature-imitating management zones Multiple use areas, e.g. "Luonnonhoitometsä", nature conservation forest, park forests, recreation areas. Zones of restricted management. Zones of restricted management based on law (northern Finland)
No or unknown function	

3.2.3 Original data

Original national data for the reference years 2000 and 2005 are extracted according to FRA 2005 categories and definitions and originates from NFI9 from years 1996-2003. The original national data and definitions from NFI8 (1986-1994) are used for year 1990 (cf. National reporting table T1).

FRA 2005 Categories / Designated function	**Area (km^2)**			
	NFI9 (1996-2003)		**NFI8 (1986-1994)**	
	Forest	**OWL**	**Forest land**	**Scrub land**
Production	204974	4875	191891	22903
Protection of soil and water	0	0	0	0
Conservation of biodiversity	16110	3267	6941	6433
Social services	381	7	0	0
Multiple purpose	3393	109	1905	498
No or unknown function	0	0	0	0
Total	**224858**	**8258**	**200736**	**29834**

3.3 Analysis and processing of national data

3.3.1 Calibration

The calibration of land area is done as for T1.

3.3.2 Estimation and forecasting

Estimation and forecasting is done for forest and OWL, years 2000 and 2005, as presented in 2.3.2. for T1. The distribution of categories (2000, 2005) is based on the proportions in the NFI9, presented in the table in Original data chapter (3.2.3).

3.4 Reclassification into FRA 2005 classes

Reclassification is done for forest and OWL, for year 1990, as presented in 2.4. for T1.

For the "total area with function", the "production" includes all forest area except the Primary function "Conservation of biodiversity", while all forests are considered to have "Conservation of biodiversity" and "Social services" function. Same division was used for OWL.

3.5 Data for National reporting table T3

FRA 2005 Categories / Designated function	Area (1000 hectares)					
	Primary function			Total area with function		
	1990	2000	2005	1990	2000	2005
Forest						
Production	21216	20488	20510	21427	20865	20888
Protection of soil and water	0	0	0	0	0	0
Conservation of biodiversity	767	1610	1612	22194	22475	22500
Social services	0	38	38	22194	22475	22500
Multiple purpose	211	339	340	not appl.	not appl.	not appl.
No or unknown function	0	0	0	not appl.	not appl.	not appl.
Total - Forest	**22194**	**22475**	**22500**	**not appl.**	**not appl.**	**not appl.**
Other wooded land						
Production	708	490	474	724	501	485
Protection of soil and water	0	0	0	0	0	0
Conservation of biodiversity	199	328	317	923	830	802
Social services	0	1	1	923	830	802
Multiple purpose	16	11	10	not appl.	not appl.	not appl.
No or unknown function	0	0	0	not appl.	not appl.	not appl.
Total – Other wooded land	**923**	**830**	**802**	**not appl.**	**not appl.**	**not appl.**

3.6 Comments to National reporting table T3

Protection of soil and water were not recorded specifically in the NFI8 or NFI9. To our understanding, there are no forests whose primary function is soil or water protection. Also the area of forest with secondary function of soil or water protection is considered to be zero.

4 Table T4 – Characteristics of Forest and Other wooded land

4.1 FRA 2005 Categories and definitions

Category	Definition
Primary	Forest / Other wooded land of native species, where there are no clearly visible indications of human activities and the ecological processes are not significantly disturbed.
Modified natural	Forest / Other wooded land of naturally regenerated native species where there are clearly visible indications of human activities.
Semi-natural	Forest / Other wooded land of native species, established through planting, seeding or assisted natural regeneration.
Productive plantation	Forest / Other wooded land of introduced species, and in some cases native species, established through planting or seeding mainly for production of wood or non wood goods.
Protective plantation	Forest / Other wooded land of native or introduced species, established through planting or seeding mainly for provision of services.

4.2 National data

4.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish National Forest Inventory (NFI). Finnish Forest Research Institute.	H	Designated functions	1990: 1986-1994 2000: 1996-2003 2005: Forecast	The NFI data permit direct calculation of data according to the FRA categories and definitions. Reclassification to FRA 2005 categories for 1990 data applying 1996-2003 NFI9 data as in T1.

4.2.2 Classification and definitions

The definitions used to extract the national data for years 2000 and 2005 from NFI9, according to FRA2005 categories.

National class	Definition
Primary forest & OWL	Land considered undisturbed by man. The definition includes forest and OWL of following condition: age; older than 159 years in Southern Finland (latitude < 64°10′) and older than 199 years in Northern Finland, cuttings, soil preparation, drainage or silvicultural treatments; no applied treatments within the longest observation period (30 years), drainage stage; undrained. In addition to the areas defined by the criteria above, some nature conservation areas are included: National parks Strict nature reserves, strictly protected zones of the Wilderness reserves.
Modified natural	Not defined. Classes Modified-natural and Seminatural forests are merged.
Semi-natural	Other forest & OWL which are not plantations according to this enquiry

The definitions used to extract the national data for year 1990 from NFI8, according to FRA2005 categories.

National class	Definition
Primary forest & OWL	Land considered undisturbed by man. The definition includes forest and OWL of following condition: age; older than 159 years in Southern Finland (latitude < 64°10′)and older than 199 years in Northern Finland, cuttings, soil preparation, drainage or silvicultural treatments; no applied treatments within the longest observation period (30 years), drainage stage; undrained. In addition to the areas defined by the criteria above, some nature conservation areas are included: Southern Finland: National parks, Strict nature reserves and nature reserves on private land. Northern Finland: areas where cuttings are forbidden by law: e.g. National parks, Strict nature reserves and part of Wilderness reserves.
Modified natural	Not defined. Classes Modified- and Seminatural forests are merged.
Semi-natural	Other forest & OWL which are not plantations according to this enquiry

4.2.3 Original data

Original national data for the reference years 2000 and 2005 are extracted according to FRA 2005 categories and definitions and originates from NFI9 from years 1996-2003. The original national data and definitions from NFI8 (1986-1994) are used for year 1990 (cf. National reporting table T1).

FRA 2005 Categories	Area (km^2)			
	NFI9 (1996-2003)		NFI8 (1986-1994)	
	Forest	OWL	Forest land	Scrub land
Primary	14183	3357	13484	18429
Modified natural	0	0	0	0
Semi-natural	210675	4900	187252	11405
Productive plantation	0	0	0	0
Protective plantation	0	0	0	0
TOTAL	**224858**	**8258**	**200736**	**29834**

4.3 Analysis and processing of national data

4.3.1 Calibration

The calibration of land area is done as for T1.

4.3.2 Estimation and forecasting

Estimation and forecasting is done for forest and OWL, for years 2000 and 2005, as presented in 2.3.2. for T1.

4.4 Reclassification into FRA 2005 classes

Reclassification is done for forest and OWL, for year 1990, as presented in 2.4. for T1

4.5 Data for National reporting table T4

FRA 2005 Categories	Area (1000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Primary	1491	1418	1419	570	337	326
Modified natural	0	0	0	0	0	0
Semi-natural	20703	21057	21081	353	493	476
Productive plantation	0	0	0	0	0	0
Protective plantation	0	0	0	0	0	0
TOTAL	**22194**	**22475**	**22500**	**923**	**830**	**802**

4.6 Comments to National reporting table T4

Plantations do not exist in Finland in the sense of FRA definition. Also in the case of artificial regeneration with plantation, naturally born tree individuals occur as a mixture species in all stands yielding to semi-natural type forests.

5 Table T5 – Growing stock

5.1 FRA 2005 Categories and definitions

Category	Definition
Growing stock	Volume over bark of all living trees more than X cm in diameter at breast height (or above buttress if these are higher). Includes the stem from ground level or stump height up to a top diameter of Y cm, and may also include branches to a minimum diameter of W cm.
Commercial growing stock	The part of the growing stock of species that are considered as commercial or potentially commercial under current market conditions, and with a diameter at breast height of Z cm or more.

5.2 National data

5.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish National Forest Inventory (NFI). Finnish Forest Research Institute.	H	Growing stock and Commercial growing stock	2000: 1996-2003 2005: Forecast	The NFI9 data permit direct calculation of data according to the FRA categories and definitions for years 2000 and 2005.
Finnish National Forest Inventory (NFI). Finnish Forest Research Institute.	H	Growing stock and Commercial growing stock	1990: 1986-1994	Reclassification of growing stock on national land use classes to FRA 2005 categories forest and OWL for 1990 data applying 1996-2003 NFI9 data.
Forest Statistics Information Service. Finnish Forest Research Institute.	H	Roundwood removals	1986-2004	

5.2.2 Classification and definitions

Information generated from the NFI9 data base to match FRA2005 definitions. On the table below, the definitions used to extract the national data for years 2000 and 2005, according to FRA2005 categories.

Class	Definition
Growing stock	All living trees on all Forest areas (see T1) and all living trees on all Other wooded land areas; Growing stock according to terms and definitions FRA 2000. Stem volume above stump of living trees includes bark, excludes branches with breast height diameter > 0 cm and until top of the three (0 cm).
Commercial growing stock	Forest available for wood supply. Includes only Productive forests and OWL, where cuttings are allowed. Stem volume above stump of living trees includes bark, excludes branches and tops. Include stem parts suitable for pulpwood or sawlog with a minimum top diameter of 7cm. Additional requirement is that at least one full length log is obtained from the stem applying national log specification.

In the table below the definitions to extract the national data for year 1990 (national land use classes, see T1 Classification and definitions) to be reclassified to FRA 2005 categories are presented.

Class	Definition
Growing stock	All living trees on all Forest land areas (see T1) and all living trees on all Scrub land areas; Growing stock according to terms and definitions FRA 2000. Stem volume above stump of living trees includes bark, excludes branches with breast height diameter > 0 cm and until top of the tree (0 cm).
Commercial growing stock	Forest available for wood supply. Includes only Productive forest and scrubland, where cuttings are allowed. Stem volume above stump of living trees includes bark, excludes branches and tops. Include stem parts suitable for pulpwood or sawlog with a minimum top diameter of 7cm. Additional requirement is that at least one full length log is obtained from the stem applying national log specification.

5.2.3 Original data

FRA 2005 Categories	Volume (1000 m^3 over bark)			
	NFI9 (1996-2003)		NFI8 (1986-1994)	
	Forest	OWL	Forest land	Scrub land
Growing stock	2085228	5277	1842905	47263
Growing stock, on forest and OWL available for wood supply	1930257	3959	1792674	36423
Commercial growing stock, on forest and OWL available for wood supply	1752657	2676	1636160	33243

5.3 Analysis and processing of national data

5.3.1 Calibration

Not needed.

5.3.2 Estimation and forecasting

For 1990, NFI8 (1986-1994) data are employed. Updating to 1990 is done by forestry board districts, forecasting: add (increment - drain) from the period *t*=1990 - inventory year. E.g., for the region measured in 1986, FRA 1990 volume is = measured volume in NFI8 + increments from the years 1987, 1988, 1989, 1990 - drain from years 1987, 1988, 1989, 1990. Estimation: e.g., for 1994 region, increment - drain from the period 1994-1991 is subtracted. Note that all the increments are measured in the NFI8. These increments are average increments during five years period preceding the inventory year (in measurement after August 1, from the inventory year and four years preceding the inventory). Drain is defined to include harvesting removals, harvesting losses, silvicultural and pre-commercial thinnings as well as unrecovered natural losses. (Recovered natural losses are included in removals.)

For 2000, NFI9 (1996-2003) data are employed. Updating to the year 2000 is done in a similar way as for 1990.

For 2005 data, forecasting was used. For the years 2004-2005, the increments of NFI9 are applied. The total drain is assumed to be the average drain under the years 1999-2003.

5.4 Reclassification into FRA 2005 classes

For 1990, the growing stock on national land use class scrubland is reclassified into FRA Forest, FRA OWL and FRA OL classes applying the distribution of NFI9 growing stock on national scrub land to the same FRA classes (Forest, OWL and OL).

5.5 Data for National reporting table T5

FRA 2005 Categories	Volume (million cubic meters over bark)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Growing stock	1907.4	2070	2158	4.6	5	5
Commercial growing stock	1685.8	1740	1814	3.2	3	3

Note. For commercial growing stock, the saw log and pulp wood volumes on Forest/OWL available for wood production have been applied.

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	0	Breast height diameter > 0 cm
2. Minimum diameter at the top end of stem (Y) for calculation of Growing stock	cm	0	Until top of the tree (0 cm).
3. Minimum diameter of branches included in Growing stock (W)	cm		Not included to growing stock
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm		Not applied, instead: Include stem parts suitable for pulpwood or sawlog with minimum top diameter of 7cm. Additional requirement is that at least one full length log is obtained from the stem applying national log specification.
5. Volume refers to “Above ground” (AG) or “Above stump” (AS)	AG / AS	AS	
6. Have any of the above thresholds (points 1 to 4) changed since 1990	Yes/No	No	
7. If yes, then attach a separate note giving details of the change	Attachment		

5.6 Comments to National reporting table T5

Commercial growing stock is the sawlog and pulpwood on forest and other wooded available for wood production.

6 Table T6 – Biomass stock

6.1 FRA 2005 Categories and definitions

Category	Definition
Above-ground biomass	All living biomass above the soil including stem, stump, branches, bark, seeds, and foliage.
Below-ground biomass	All living biomass of live roots. Fine roots of less than 2mm diameter are excluded because these often cannot be distinguished empirically from soil organic matter or litter.
Dead wood biomass	All non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.

6.2 National data

6.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish National Forest Inventory (NF). Finnish Forest Research Institute BEFs etc.: see 1.4	H	The NFI data since 1921. The data applied from years: 1990: 1986-1994 2000: 1996-2004 2005: 1996-2004, with forecasts		The NFI data with the BEF models allow calculation on the basis of FRA categories and definitions

6.2.2 Classification and definitions

Growing stock is defined on the basis of FAO definitions (FRA 2000) (see T5 and T10). All trees on FAO Forest and OWL, respectively, are included (see T1 and T10). Growing stock is defined on the basis of FAO definitions (FRA 2000). For above and below ground biomass, the biomass expansion factors (BEFs) by Lehtonen et al. (2004) have been applied. These BEFs have been modified from Marklund's functions (1988).

Dead woody biomass includes all non-living woody biomass of less than 10 cm in diameter and not expressed in other woody biomass. It also includes the biomass of roots (> 5 cm) and stumps predicted by means of the models by Lehtonen et al. (2004). The applied BEFs are:

Tree species group	above ground	below ground
Pine	0.5997	0.1054
Spruce	0.6828	0.1311
Broad leaved tree species	0.5920	0.1900

6.2.3 Original data

Estimation and forecasting of the data for the growing stock has been described in the connection of the National Reporting Table T5. The data for dead wood have been measured in NFI9, in years 1996-2003, for combined national forest land and scrub land. These data have been applied for 1990, 2000 and 2005 without any estimation or forecasting because the changes in dead wood are assumed to be slow, and because of some uncertainties in the biomass estimation (e.g. stumps and roots related to dead wood). The total biomass is shared between FRA Forest and OWL on the area basis in each time point 1990, 2000 and 2005.

Table. The volume of standing and lying dead wood by stage of decay

Stage of decay	1			2			3		
	Standing	Lying	Total	Standing	Lying	Total	Standing	Lying	Total
Species	1000 m^3								
Pine	13017	5049	18066	3298	7686	10983	772	12808	13581
Spruce	5998	3860	9858	342	3060	3401	100	4102	4202
Birch	1157	1162	2319	1473	1366	2839	1468	1380	2848
Aspen	367	358	724	96	252	348	62	311	373
Other br. l.	422	350	770	363	304	668	244	313	557
Other conif.	7	2	9	0	0	1	0	0	0
Unident. br. l	16	75	91	16	425	441	5	754	759
Unident. conif.	21	26	47	4	29	33	11	50	61
Unident.	10	108	117	2	325	327	1	683	684
Total	**21012**	**10989**	**32001**	**5593**	**13447**	**19041**	**2664**	**20402**	**23066**

Table. The volume of standing and lying dead wood by stage of decay, continuation

Stage of decay	4			5	Total		
	Standing	Lying	Total	Lying	Standing	Lying	Total
	1000 m^3						
Pine	147	17619	17766	11613	17232	54775	72007
Spruce	44	5107	5152	1925	6485	18053	24538
Birch	850	3107	3958	2886	4948	9902	14850
Aspen	8	413	421	204	532	1539	2071
Other br. l.	122	234	355	116	1150	1316	2467
Other conif.	0	1	1	6	7	10	17
Unident. br. l	0	1480	1480	2032	37	4766	4803
Unident. conif.	0	129	129	177	36	409	445
Unident.	6	1515	1521	2667	18	5299	5318
Total	**1177**	**29605**	**30782**	**21625**	**30447**	**96070**	**126516**

The volumes of dead wood (with a minimum diameter of 10cm) are given by stage of decay in the table above separately for standing and lying trees. These volumes have been converted to biomass using the remaining biomass density by stage of decay as given in Mäkinen at al. (2005). The remaining density % varies in this study from 21 to 91 depending on the tree species and stage of decay. Note that decay class 5 is used only in the case of lying dead wood.

6.3 Analysis and processing of national data

6.3.1 Calibration

Not needed

6.3.2 Estimation and forecasting

Estimation and forecasting for the growing stock are described in Table T5. For dead wood, neither estimation nor forecasting has been applied because the changes in dead wood volumes are assumed to be slow, and because the biomass content may include other high error sources (e.g. biomass of roots).

6.4 Reclassification into FRA 2005 classes

Not needed

6.5 Data for National reporting table T6

FRA 2005 Categories	Biomass (million metric tonnes oven-dry weight)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Above-ground biomass	1199.3	1295.8	1350.7	2.8	3.2	3.2
Below-ground biomass	247.6	269.3	280.6	0.6	0.7	0.7
Dead wood biomass	34.9	34.9	34.9	0.1	0.1	0.1
TOTAL	**1482**	**1560**	**1666**	**4**	**4**	**4**

Thresholds used by the country are the following:

Table: Biomass for Forest and OWL

Item	Unit	Information
Area over which woody biomass and tree biomass has been measured	1000 ha	Forest 1990: 22194 2000: 22475 2005: 22500 OWL 1990: 923 2000: 830 2005: 802
Average height of the stumps	Cm	Appr. 10
Minimum diameter at breast height of standing trees for dead woody biomass measurements	Cm	10
Minimum diameter at the top end of lying logs for dead woody biomass measurements	Cm	10
Minimum diameter at breast height of living standing trees for tree biomass measurements	Cm	0
Minimum diameter of the branches for dead woody biomass and tree biomass measurements	Cm	0
Minimum diameter of the roots for tree biomass measurements	Cm	0.2
Minimum diameter of the roots for dead woody biomass measurements	Cm	5
Stump biomass is in above/below ground tree biomass	Above/Below	Above
Wether biomass includes or excludes bark	Includes/Excludes	Includes
Have above thresholds changed since 1990	Yes/No	No

6.6 Comments to National reporting table T6

Calculation of biomass of living trees for stem, foliage, branches, bark, stump and roots are based on the models by Lehtonen et al. (2004). Biomass of dead wood is calculated from the volume as follows. Tree stem parts, either standing or lying, with a minimum length of 1.3 m and minimum diameter of 10 cm are measured in the field. The biomass of stumps and roots (> 5 cm) are added using the BEFs by Lehtonen et al. (2004). Remaining density factors by decay classes given separately for standing and lying trees as given in Mäkinen et al. (2004) are applied to predict the remaining biomass. One should not that the woody biomass of the tree parts shorter than 1.3 m or thinner than 10 cm (including corresponding stumps and roots) is missing as well as the biomass of the stumps and roots of felled trees.

7 Table T7 – Carbon stock

7.1 FRA 2005 Categories and definitions

Category	Definition
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark, seeds, and foliage.
Carbon in below-ground biomass	Carbon in all living biomass of live roots. Fine roots of less than 2 mm diameter are excluded, because these often cannot be distinguished empirically from soil organic matter or litter.
Carbon in dead wood biomass	Carbon in all non-living woody biomass not contained in the litter, either standing, lying on the ground, or in the soil. Dead wood includes wood lying on the surface, dead roots, and stumps larger than or equal to 10 cm in diameter or any other diameter used by the country.
Carbon in litter	Carbon in all non-living biomass with a diameter less than a minimum diameter chose by the country for lying dead (for example 10 cm), in various states of decomposition above the mineral or organic soil. This includes the litter, fumic, and humic layers.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a specified depth chosen by the country and applied consistently through the time series.

7.2 National data

7.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish National Forest Inventory (NF). Finnish Forest Research Institute. National reporting tables T5 and T6	H	Above-ground biomass, Below-ground biomass and Dead wood biomass	The NFI data since 1921. The data applied from years: 1990: 1986-1994 2000: 1996-2004 2005: 1996-2004, with forecasts	The NFI data with the BEF models allow calculation on the basis of FRA categories and definitions

7.2.2 Classification and definitions

The definitions of biomass were applied. Carbon content was assumed to be 0.5 times biomass.

7.2.3 Original data

Forest carbon data were estimated using biomass data as given in the National Reporting Table T6 and multiplied by the default conversion factor of 0.5. The woody biomass not included is described in Chapter 6.6.

7.3 Analysis and processing of national data

7.3.1 Calibration

Not needed.

7.3.2 Estimation and forecasting

Estimation or forecasting of national reporting tables T5 and T6 have been applied.

7.4 Reclassification into FRA 2005 classes

Not needed

7.5 Data for National reporting table T7

FRA 2005 Categories	Carbon (Million metric tonnes)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Carbon in above-ground biomass	599.7	647.9	675.4	1.4	1.6	1.6
Carbon in below-ground biomass	123.8	134.7	140.3	0.3	0.3	0.3
Sub-total: Carbon in living biomass	**723.5**	**782.6**	**815.7**	**1.7**	**1.9**	**1.9**
Carbon in dead wood	15.0	15.0	15.0	0.1	0.1	0.1
Carbon in litter	NDA	NDA	NDA	NDA	NDA	NDA
Sub-total: Carbon in dead wood and litter	**15.0**	**15.0**	**15.0**	**0.1**	**0.1**	**0.1**
Soil carbon to a depth of _____ cm	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
TOTAL CARBON	**738.5**	**797.6**	**830.7**	**1.8**	**2.0**	**2.0**

8 Table T8 – Disturbances affecting health and vitality

8.1 FRA 2005 Categories and definitions

Category	Definition
Disturbance by fire	Disturbance caused by wildfire, independently whether it broke out inside or outside the forest/OWL.
Disturbance by insects	Disturbance caused by insect pests that are detrimental to tree health.
Disturbance by diseases	Disturbance caused by diseases attributable to pathogens, such as a bacteria, fungi, phytoplasma or virus.
Other disturbance	Disturbance caused by other factors than fire, insects or diseases.

8.2 National data

8.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish Statistical Yearbook of Forestry 2003. METLA, Finland. Original source: Ministry of Interior.	H	Forest fires: burnt area (ha)	1988-2002 (1)	Disturbances on forest land
Finnish National Forest Inventory. Finnish Forest Research Institute	H	Other T8 categories in year 1990	1986-1994 (2)	Disturbances on forest land
Finnish National Forest Inventory. Finnish Forest Research Institute	H	Other T8 categories in year 2000	1996-2003 (3)	Disturbances on forest land

Footnotes:
1. The values for 1990 and 2000 are an average of years 1988-1992 and 1998-2002, respectively.
2. The values for 1990 are based on the NFI8 carried out region by region in years 1986 - 1994.
3. The values for 2000 are based on the NFI9 carried out region by region in years 1996 - 2003.

8.2.2 Classification and definitions

National class	Definition
Forest	The potential increment of the growing stock is at least 1.0 m^3/ha/a

Note: If different national data sources use different classes and definitions, a table such as above is needed for each relevant data source.

For including disturbances in the Table 8, following criteria has been used: In the field inventory, the degree of damage occurring in the forest stand is assessed according to the effect of the damage on the growth and yield, mortality and quality of timber. The NFI categories of degree of damage are:

- No damages
0 Mild damage: The damage has not affected the quality of stand or development class.
1 Noticeable damage: The damage has decreased the quality of the stand by one class or made an under-productive stand even less productive. The damage has not changed the

development class (except possibly destroyed the upper storey over an established seedling storey).

2 Serious damage: The damage has decreased the quality of the stand by more than one class or has changed the development class into non-stocked. A stand that was under-productive stand before the damage attacked has essentially lower productivity because of the damage.

3 Complete damage: The stand must be immediately regenerated.

The damages belonging to the categories 1 - 3 has been included to the T8.

If forests have been affected by several disturbances simultaneously, only the most significant one has been assessed.

8.2.3 Original data

In the table below, original data for the reporting year 1990: Occurence of damaging agents reducing stand quality in 1986-94 (the year of inventory varies between regions). Percentage (%) of national forest land area. The total forest land area is 20 032 000 ha.

Damaging agent													Total
Wind	**Snow**	**Other climatic** (1)	**Compe-tition** (2)	**Human influence** (3)	**Moles**	**Elk**	**In-sects**	**Cremme-niella abietina**	**Cronar-tium flaccidum**	**Other fungi**	**Many symptoms** (4)	**Un-known**	
1.2	2.3	1.7	1.3	0.5	0.1	1.1	0.3	1.2	0.9	4.9	1.5	4.3	21.3

Footnotes:
1. Frost, drought, moisture, nutrient imbalance or fire.
2. Shadowing or whipping effect caused by neighbouring trees or lesser vegetation (too high number of stems or basal area of the growing stock is not regarded as damage).
3. Logging damages (stem and root damages on living trees occurred during thinning), air pollution (cause of the pollution must be identified, e.g. industry, traffic, agriculture) or other human impact. Human activities are recorded as a causing agent only if the damage was caused unintentionally. E.g. logging itself is not regarded as a damaging agent.
4. Many symptoms of damage occur in over-aged senescent forests caused by many damaging agents at the same time.

Data for the reporting year 2000 has been calculated directly into the FRA categories from the NFI field data. The classes of damaging agents in the field inventory (NFI) are described in section 8.4.

For the both reporting years, 1990 and 2000, the area burnt by forest fires is from the Finnish Statistical Yearbook of Forestry, where the original source is Ministry of Interior. The original data are in the table below.

Year	**Burnt area, hectares**
1988	289
1989	518
1990	434
1991	226
1992	1081
1998	95
1999	623
2000	372
2001	187
2002	590

8.3 Analysis and processing of national data

8.3.1 Estimation and forecasting

Not needed, except for forest fire, where the averages of 1988-1992 and 1998-2002 are used for 1990 and 2000 respectively.

8.4 Reclassification into FRA 2005 classes

National disturbance classes in NFI data 1990	**FRA 2005 disturbance classes**			
	Fire	**Insects**	**Disease**	**Other**
Abiotic (wind, snow, other climatic)				100%
Human influence (logging, air pollution, other)				100%
Animals (moles, elks)				100%
Insects		100%		
Fungi (C.abietina, C.flaccidum, other fungi)			100%	
Natural competition				100%
Other (many symptoms, unknown)				100%

National disturbance classes in NFI data 2000		**FRA 2005 disturbance classes**			
		Fire	**Insects**	**Disease**	**Other**
Abiotic	Wind				100%
	Snow				100%
	Frost				100%
	Other climatic				100%
	Fire (1)				
	Soil factors (e.g. frost, drought, nutrient imbalance)				100%
	Logging				100%
	Air pollution				100%
	Other human influence				100%
Animals	VOLE				100%
	Moose				100%
	Other vertebrate				100%
	Bark beetles		100%		
	Pine weevil		100%		
	Pine sawfly		100%		
	Diprion pini		100%		
	Neodiprion sertifer		100%		
	Other needle damaging insect		100%		
	Spruce bark beetle		100%		
	Other identified insect		100%		
	Not identified insect		100%		
Fungi	Annosum root rot			100%	
	Other rot fungus			100%	
	Scleroderris cancer			100%	
	Pine branch twist			100%	
	Blister rust			100%	
	Other rust fungus			100%	
	Pine needle-cast fungus			100%	
	Other identified fungus			100%	
	Unidentified fungus			100%	
Natural competition (2)					100%
Unknown					100%

1. The reported area of forest fires is from the Finnish Statistical Yearbook of Forestry, not from the NFI data.
2. Shadowing or whipping effect caused by neighbouring trees or lesser vegetation (too high number of stems or basal area of the growing stock is not regarded as damage).

8.5 Data for National reporting table T8

FRA-2005 Categories	Average annual area affected (1000 hectares)			
	Forests		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	0.5	0.4	NDA	NDA
Disturbance by insects	60	46	NDA	NDA
Disturbance by diseases	1402	1042	NDA	NDA
Other disturbance	2804	3883	NDA	NDA

8.6 Comments to National reporting table T8

In the NFI field measurements, disturbances are assessed from stands belonging to forest land. National forest land definition is applied (i.e., minimum stand size is 0.25 ha and potential increment of the growing stock is at least 1.0 m^3/ha/a). Information on disturbances are not assessed on scrub land (increment of the growing stock is 0.1 - 0.99 m^3/ha/a). About 2.25 mill ha of the national scrub land (3 mill. ha) belongs to FRA Forest, the rest mainly to FRA OWL and a minor part to FRA OL. On the other hand, a part of the national waste land with bush and tree cover not meeting the national scrub land requirements belong to FRA OWL. Thus, the actual area of disturbances for FRA forest may be larger, and the figures for OWL are not available (NDA).

It should also be noted that the presented figures are accumulative. All damages reported as occurring in one year have not started in that specific year.

9 Table T9 – Diversity of tree species

9.1 FRA 2005 Categories and definitions

Category	Definition
Number of native tree species	The total number of native tree species that have been identified within the country.
Number of critically endangered tree species	The number of native tree species that are classified as "Critically endangered" in the IUCN red list.
Number of endangered tree species	The number of native tree species that are classified as "Endangered" in the IUCN red list.
Number of vulnerable tree species	The number of native tree species that are classified as "Vulnerable" in the IUCN red list.

9.2 National data

9.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
http://www.redlist.org	H	Critically, endangered and vulnerable tree species	2000	
Hämet-Ahti et al. (Ed.) 1998. Retkeilykasvio (Field flora of Finland). Finnish museum of natural history, Botanical museum, Helsinki.	H	Native tree species	2000	

9.2.2 Classification and definitions

The FRA definition of tree is used: A tree is defined as a woody perennial with a single main stem or in case of coppice with several stems, having a more or less definite crown. A tree should under normal condition be able to reach the height of 5 m at maturity *in situ*.

9.2.3 Original data

9.3 Data for National reporting table T9

FRA 2005 Categories	Number of species (year 2000)
Native tree species	32
Critically endangered tree species	0
Endangered tree species	0
Vulnerable tree species	0

9.4 Comments to National reporting table T9

Native (indigenous) tree species occurring on forest and other wooded land are:

Picea abies
Pinus sylvestris
Juniperus communis
Taxus baccata
Ulmus laevis
Ulmus glabra
Quercus robur
Betula pubescens
Betula pendula
Alnus incana
Alnus glutinosa
Salix pentandra
Salix triandra
Salix myrsinifolia
Salix borealis
Salix caprea
Salix pyrofolia
Populus tremula
Tilia cordata
Malus sylvestris
Sorbus aucuparia
Sorbus hybrida
Sorbus intermedia
Sorbus toedori
Crataegus rhipidophylla
Crataegus monogyna
Prunus spinosa
Prunus padus
Acer platanoides
Rhamnus catharticus
Rhamnus frangula
Fraxinus excelsior

10 Table T10 – Growing stock composition

10.1 FRA 2005 Categories and definitions

List of species names (scientific and common names) of the ten most common species.

10.2 National data

10.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish National Forest Inventory (NFI). Finnish Forest Research Institute.	H	Growing stock composition	2000: 1996-2003	The NFI9 data permit direct calculation of data according to the FRA categories and definitions for year 2000.
Finnish National Forest Inventory (NFI). Finnish Forest Research Institute.	H	Growing stock composition	1990: 1986-1994	Reclassification of growing stock on national land use classes to FRA 2005 categories forest and OWL applying 1996-2003 NFI9 data.
Forest Statistics Information Service. Finnish Forest Research Institute.	H	Roundwood removals	1986-2003	

10.2.2 Original data

Original national data for the reference year 2000 is extracted according FRA 2005 categories and definitions from NFI9 (1996-2003).

FRA 2005 Categories / Species name (Scientific name and common name)	Growing Stock in Forests (million cubic meters) 1996-2003
Pinus sylvestris L.- Scots pine	994.3
Picea abies (L.) H. Karst. - Norway spruce	694.2
Betula pubescens Roth - Downy birch	248.8
Betula pendula Ehrh. - Silver birch	75.2
Populus tremula L.- European aspen	32.5
Alnus incana (L.) Moench- Grey alder	22.0
Salix caprea L.- Goat willow	6.1
Sorbus aucuparia L. - European mountain-ash	5.1
Alnus glutinosa (L.) Gaertn.- Black alder	4.8
Prunus padus L. European Bird Cherry	0.4
Remainder of species	1.8
TOTAL	**2085.2**

Original national data for the reference year 1990 is extracted according national categories and definitions from NFI8 (1986-1994).

FRA 2005 Categories / Species name (Scientific name and common name)	**Growing Stock (million cubic meters)**	
	Forest land	**Scrub land**
	NFI8	**NFI8**
Pinus sylvestris L.- Scots pine	833.0	30.7
Picea abies (L.) H. Karst. - Norway spruce	684.8	5.9
Betula pubescens Roth - Downy birch	203.3	10.0
Betula pendula Ehrh. - Silver birch	63.4	0.3
Populus tremula L.- European aspen	23.7	0.2
Alnus incana (L.) Moench- Grey alder	20.5	0.1
Salix caprea L.- Goat willow	1.9	0
Sorbus aucuparia L. - European mountain-ash	0.3	0
Alnus glutinosa (L.) Gaertn.- Black alder	4.0	0.1
Prunus padus L. European Bird Cherry	NDA	NDA
Remainder of species	7.8	0
TOTAL	1842.7	47.3

10.3 Analysis and processing of national data

10.3.1 Calibration

Not needed.

10.3.2 Estimation and forecasting

The total volumes of growing stock for 1990 and 2000 are taken from table T5. The total volume for 1990 is shared between tree species on the basis of the proportions of the volumes in NFI8 (1986-1994) and for 2000 on the basis of the proportions of the volumes in NFI9 (1996-2003).

10.4 Data for National reporting table T10

FRA 2005 Categories / Species name (Scientific name and common name)	**Growing Stock in Forests (million cubic meters)**	
	1990	**2000**
Pinus sylvestris L.- Scots pine	870.7	987
Picea abies (L.) H. Karst. - Norway spruce	698.3	689
Betula pubescens Roth - Downy birch	214.8	247
Betula pendula Ehrh. - Silver birch	64.4	75
Populus tremula L.- European aspen	24.1	32
Alnus incana (L.) Moench- Grey alder	20.9	22
Salix caprea L.- Goat willow	1.9	6
Sorbus aucuparia L. - European mountain-ash	0.3	5
Alnus glutinosa (L.) Gaertn.- Black alder	4.1	5
Prunus padus L. European Bird Cherry	NDA	0.4
Remainder of species	8.0	2
TOTAL	**1907.4**	**2070**

The order of tree species is based on the species volumes in 2000.

11 Table T11 – Wood removal

11.1 FRA 2005 Categories and definitions

Category	Definition
Industrial wood removal	The wood removed (volume of roundwood over bark) for production of goods and services other than energy production (woodfuel).
Woodfuel removal	The wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

11.2 National data

11.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish Statistical Yearbook of Forestry 2003. Finnish Forest Research Institute. ISBN 951-40-1894-X.	H	Roundwood removal	1988-1992 and 1998-2002	
Finnish Forest Sector Economic Outlook 2004-2005. Finnish Forest Research Institute. ISBN 951-40-1947-4.	H	Forecast of commercial fellings (commercial roundwood removal)	2005	Removal forecasts by tree species are not included in the publication, only sawlog and pulpwood totals. Forecasts by tree species are asked from the author.
Metinfo - forest information services. http://www.metla.fi/metinfo/index.htm	H	Roundwood removal and Commercial roundwood removal	2003	

11.2.2 Classification and definitions

National class	Definition
Roundwood removal	Roundwood removal includes all roundwood taken out from the forest during the year. It includes commercial roundwood cuttings for industrial use and export, fuelwood for houses and small-scale sawing of logs removed from own forests.
Commercial roundwood removal	Commercial roundwood removal includes all domestic commercial roundwood for industrial use or export.

11.2.3 Original data

Year	Average roundwood removal							
	Logs			Pulpwood			Fuelwood	Grand total
	Pine	Spruce	Hardwood	Pine	Spruce	Hardwood		
	1000 m^3/year including bark							
1988-1992	8 726	9 980	1 438	9 002	9 422	5 276	3 372	47 208
1998-2002	11 018	15 456	1 372	12 410	9 954	5 508	4 886	60 608

Year	Forecast of commercial roundwood removal (commercial fellings)							
	Logs			Pulpwood			Fuelwood	Grand total
	Pine	Spruce	Hardwood	Pine	Spruce	Hardwood		
	1000 m^3/year including bark							
2005	10 900	14 600	1 200	13 400	11 600	6 400	25	58 200

Year	Logs			Pulpwood			Fuelwood	Grand total
	Pine	Spruce	Hardwood	Pine	Spruce	Hardwood		
	Roundwood removal, 1000 m^3 including bark							
2003	11 718	14 805	1 131	12 477	9 787	5 995	5 228	61 142
	Commercial roundwood removal, 1000 m^3 including bark							
2003	11 307	14 371	1 084	12 445	9 754	5 994	76	55 030

Year	Forecast of roundwood removal (see 12.3.1)							
	Logs			Pulpwood			Fuelwood	Grand total
	Pine	Spruce	Hardwood	Pine	Spruce	Hardwood		
	1000 m^3 including bark							
2005	11300	15000	1300	13500	11600	6400	5200	64300

11.3 Analysis and processing of national data

11.3.1 Estimation and forecasting

Roundwood removal forecasts for year 2005 are derived by multiplying the commercial roundwood removal forecasts for the year 2005 by the ratios of roundwood removals and commercial roundwood removals of year 2003. For fuelwood, the (rounded) removal of year 2003 is used as a forecast for the year 2005.

11.4 Reclassification into FRA 2005 classes

Roundwood removal estimate for other wooded land (OWL) is based on the area of cuttings on OWL (500 ha/year) and on estimated average roundwood removal (10 m^3/ha). All roundwood removal on OWL is pine pulpwood.

11.5 Data for National reporting table T11

FRA 2005 Categories	Volume in 1000 cubic meters of roundwood over bark					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Industrial roundwood	43 831	55 717	59 095	5	5	5
Woodfuel	3 372	4 886	5 200	0	0	0
TOTAL for Country	**47 203**	**60 603**	**64 295**	**5**	**5**	**5**

12 Table T12 – Value of wood removal

12.1 FRA 2005 Categories and definitions

Category	Definition
Value of industrial wood removal	Value of the wood removed for production of goods and services other than energy production (woodfuel).
Value of woodfuel removal	Value of the wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

12.2 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish Statistical Yearbook of Forestry 2003. Finnish Forest Research Institute. ISBN 951-40-1894-X.	H	Average delivery prices in non-industrial, private forests	1988-1992 and 1998-2002	
Finnish Forest Sector Economic Outlook 2004-2005. Finnish Forest Research Institute. ISBN 951-40-1947-4.	H H	Forecast of average stumpage prices in non-industrial private forestry Forecast of exchange rate	2005 2005	
Bank of Finland / Information Service	H	Exchange rates: FIM/USD €/USD	1988-1992 , 1998 1999-2002	Annual mean exchange rates are used instead of rates of the last day of the year (Appendix 4).
Metinfo - forest information services. http://www.metla.fi/metinfo/index.htm	H	Average difference of delivery and stumpage prices in non-industrial, private forests	2003	

12.2.2 Classification and definitions

National class	Definition
Delivery price	Price of wood in delivery sales. Delivery sale=Seller is responsible for the cutting and transporting of trees to the road side landing.
Stumpage price	Price of wood in standing sales. Standing sale=Buyer has a licence to cut the trees specified in a agreement between buyer and seller.

12.2.3 Original data

Year	Average delivery prices					
	Logs			Pulpwood		
	Pine	Spruce	Hardwood	Pine	Spruce	Birch
	€ / m³					
1988-1992	42.90	35.94	45.56	28.84	32.59	26.97
1998-2002	47.62	43.55	46.83	24.85	31.20	25.74

Year	Forecast of average stumpage prices					
	Logs			Pulpwood		
	Pine	Spruce	Birch	Pine	Spruce	Birch
	€ / m³					
2005	45.60	44.80	40.60	12.90	20.90	12.00

Year	*Average difference of delivery and stumpage prices*					
	Logs			*Pulpwood*		
	Pine	*Spruce*	*Hardwood*	*Pine*	*Spruce*	*Birch*
	€ / m³					
2003	1.06	1.44	1.44	11.02	8.82	11.27

Year	Forecast of average delivery prices (see 13.3.1)					
	Logs			Pulpwood		
	Pine	Spruce	Birch	Pine	Spruce	Birch
	€ / m³					
2005	46.70	46.20	42.00	23.90	29.70	23.30

Exchange rates (annual means)			
Year	**FIM/USD**	**Year**	**Euro/USD**
1988	4.1914	**1999**	0.9383
1989	4.2951	**2000**	1.0827
1990	3.8314	**2001**	1.1165
1991	4.0533	**2002**	1.0576
1992	4.4904		
1998	5.3441	**2005**	0.8000

12.3 Analysis and processing of national data

12.3.1 Estimation and forecasting

The differences between delivery and stumpage prices in year 2003 are added to the forecasts of stumpage prices for year 2005 to get forecasts for delivery prices. Price of fuelwood = price of birch pulpwood.

The values of roundwood removals are calculated by multiplying the prices (5 year agerages/2005 forecasts) with volumes of wood removals (5 year averages/2005 forecasts). The results are converted to US dollars using following exchange rates: Exchange rates for years 1990 and 2000 are averages of mean annual exchange rates in 1988-1992 and 1998-2002 respectively (Source: Bank of Finland). Exchange rate for year 2005 is a forecast. Before year 1999 a factor 1 € = 5,94573 FIM is used to convert FIMs to euros. Mean annual rates are considered to be more applicable than "one day" -rates (December 31.) of appendix 4.

12.4 Reclassification into FRA 2005 classes

Roundwood removal estimate for other wooded land (OWL) is based on the area of cuttings on OWL (500 ha/year) and on estimated average roundwood removal (10 m^3/ha). All roundwood removal on OWL is pine pulpwood.

12.5 Data for National reporting table T12

FRA 2005 Categories	Value of roundwood removal (1000 USD)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Industrial roundwood	2 148 013	1 985 399	2 614 351	205	122	149
Woodfuel	129 598	123 448	151 450	0	0	0
TOTAL for Country	**2 277 611**	**2 108 847**	**2 765 801**	**205**	**122**	**149**

13 Table T13 – Non-wood forest product removal

13.1 FRA 2005 Categories and definitions

The following categories of non-wood forest products have been defined:

Category
Plant products / raw material
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
Animal products / raw material
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Bush meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

13.2 National data

13.2.1 Data sources

References to sources of information	**Quality (H/M/L)**	**Variable(s)**	**Year(s)**	**Additional comments**
Finnish Statistical Yearbook of Forestry 2003. METLA, Finland. (Original data source: Food facts Ltd)	M	Wild berries and mushrooms	1988 - 2003	
Finnish Statistical Yearbook of Forestry 2003. METLA, Finland. (Original data source: Finnish Game and Fisheries Research Institute)	M	Hides, skins and trophies Bush meat	1988 - 2003	
Finnish Statistical Yearbook of Forestry 2003. METLA, Finland. (Original data source: Board of Customs)	H	Raw material for utensils, handicrafts & construction (Lichen export)	1988 - 2003	
Hytönen, Marjatta (ed.) 1995. *Multiple-use forestry in the Nordic countries*. METLA, Finland.	L	Ornamental (Christmas trees)	1990	
Finnish Statistical Yearbook of Forestry 2004. METLA, Finland.	M	Ornamental (Christmas trees)	2000, 2005	

Finnish Statistical Yearbook of Forestry, 2003. METLA, Finland. (Original data source: The association of Reindeer Herding Cooperatives)	H	Reindeer meat	1988 - 2003	

13.2.2 Classification and definitions

All NWFP product values are on forest land, scrub land and waste land according to national land use classification, see T1 Classification and definitions.

13.2.3 Original data

NWFP products	Quantity harvested/collected	Total		
1. Food	**Unit:**	**1990** (1)	**2000** (1)	**2005**(1)
Cowberry *(Vaccinium vitis-idaea)* (2)	1 000 kg	5 732	4 336	
Bilberry *(Vaccinium myrtillus)* (2)		2 038	1 692	
Cloud berry *(Rubus chamaemorus)* (2)		424	224	
Other wild berries (2)		100	262	
Wild herbs		NDA	NDA	
Sum. Berries for sale (2)		8 294	6 514	10 000
Wild berries for household use (3)		30 000	30 000	30 000
Sum. Berries		**38 294**	**36 514**	**40 000**
Mushrooms (2)		596	696	
Mushrooms for household use (3)		5 364	6 264	
Sum. Mushrooms		**5 960**	**6 960**	**7 000**
Sum. 1. Food		**44 254**	**43 474**	**47 000**

Footnotes:
1. The values for 1990 and 2000 are averages of years 1988-1992 and 1998-2002 respectively, and the figures for 2005 are forecasts.
2. Berries and mushrooms picked for sale.
3. Berries and mushrooms picked for household use are estimations.

NWFP products	Quantity harvested/collected	Total		
5. Raw material for utensils, handicrafts & construction	**Unit:**	**1990** (1)	**2000** (1)	**2005**(1)
Lichen (2)	1 000 kg	468	309	309
6. Ornamental plants				
CHRISTMAS TREES	1 000 Pcs	250	1200	1200

Footnotes:
1. The values for 1990 and 2000 are an average of years 1988-1992 and 1998-2002, and the figures for 2005 are forecasts.
2. Lichens (*Cladonia stellaris*) picked for export.

NWFP products	Quantity harvested/collected	Total		
10. Hides and Skins	**Unit:**	**1990** (1)	**2000** (1)	**2005**(1)
Large predators	Number of skins	140	151	151
Moose and other artiodactylus		55 000	75 000	75 000
Fur bearing animals		296 000	260 000	260 000
Sum 10. Hides and skins		**351 140**	**335 151**	**335 151**

Footnote:
1. The values for 1990 and 2000 are an average of years 1988-1992 and 1998-2002, and the figures for 2005 are forecasts.

NWFP products	Quantity harvested/collected	Total		
12. Bush meat	**Unit:**	**1990**(1)	**2000**(1)	**2005**(1)
Moose and other artiodactylus	1 000 kg	7 149	8 360	8 360
Hares		719	691	691
Grouse		302	194	194
Beavers		19	34	34
Sum 12. Bush meat		**8 189**	**9 279**	**9 279**

Footnote:
1. The values for 1990 and 2000 are an average of years 1988-1992 and 1998-2002, and the figures for 2005 are forecasts.

NWFP product	Quantity harvested/collected	Total		
15. Other edible animal products	**Unit:**	**1990**(1)	**2000**(1)	**2005**(1)
Reindeer husbandry (meat)	1 000 kg	3 500	2 260	2 260

Footnote:
1. The values for 1990 and 2000 are an average of years 1988-1992 and 1998-2002, and the figures for 2005 are forecasts.

13.3 Analysis and processing of national data

13.3.1 Estimation and forecasting

The number of Christmas trees was converted into kilograms using the unit weight of 10 kg/tree.

The forecasting for 2005 was made taking into account trends, and if no trend was evident, the forecast value is same as that reported for the year 2000.

13.4 Reclassification into FRA 2005 classes

Not needed.

13.5 Data for National reporting table T13

FRA 2005 Categories	Scale factor	Unit	NWFP removal		
			1990	2000	2005
Plant products / raw material					
1. Food	1000	Kg	44 254	43 474	47 000
2. Fodder			NDA	NDA	NDA
3. Raw material for medicine and aromatic products			NDA	NDA	NDA
4. Raw material for colorants and dyes			NDA	NDA	NDA
5. Raw material for utensils, handicrafts & construction	1000	Kg	468	309	309
6. Ornamental plants	1000	Kg	2 500	12 000	12 000
7. Exudates			NDA	NDA	NDA
8. Other plant products			NDA	NDA	NDA
Animal products / raw material					
9. Living animals			NDA	NDA	NDA
10. Hides, skins and trophies	1000	Psc.	351	355	355
11. Wild honey and bee-wax			NDA	NDA	NDA
12. Bush meat	1000	Kg	8 189	9 279	9 279
13. Raw material for medicine			NDA	NDA	NDA
14. Raw material for colorants			NDA	NDA	NDA
15. Other edible animal products	1000	Kg	3 500	2 260	2 260
16. Other non-edible animal products			NDA	NDA	NDA

13.6 Comments to National reporting table T13

List of species in NWFP product categories in the original data:

1.Food:

Wild berries:

Cowberry *(Vaccinium vitis-idaea)*
Bilberry *(Vaccinium myrtillus)*
Cloud berry *(Rubus chamaemorus)*

Other wild berries:

Black crowberry (*Empetrum nigrum)*
Granberries (*Vaccinium oxococcos* and *Vaccinium microcarpum)*
Artic bramble (*Rubus arcticus*)
Mountain ash berries *(Sorbus aucuparia)*
Sea buckthorn berries *(Hippophae rhamnoides)*

Mushrooms (species picked for sale):

Boletus edulis and *B. pinophilus*
Suillus variegatus
Leccinum versipelle, L.vulpinum and *L.aurantiacum*
Suillus luteus
Lactarius trivialis and *L.utilis*
Lactarius rufus
Lactarius torminosus
Lactarius deterrimus and *L.deliciosus*
Russula paludosa
Russula decolorans
Russula claroflava

Russula vinosa
Hygrophorus camarophyllus
Rozites caperata
Cantharellus cibarius
Cantharellus tubaeformis
Craterellus cornucopioides
Albatrellus ovinus
Hydnum repandum
Gyromitra esculenta
Morchella spp.
Lentinula edodes

10. Hides, skins and trophies:

Fur bearing animals:
Beavers *(Castor fiber)*
Red fox *(Vulpes vulpes)*
Badger *(Meles meles)*
Raccoon dog *(Nyctereutes procyonoides)*
Pine marten *(Martes martes)*
Ermine *(Mustela erminea)*
American mink *(Mustela vison)*
Polecat *(Mustela putorius)*
Muskrat *(Ondatha zibethicus)*
Squirrel *(Sciurus vulgaris)*
Otter *(Lutra lutra)*
Moose and other artiodactylus:
Moose *(Alces alces)*
White-tailed deer (*Odocoileus virginianus*)
Fallow deer (*Dama dama*)
Roe deer *(Cervus elaphus)*
Wild forest reindeer (*Rangifer tarandus fennicus*)
Mouflon *(Ovis musimon)*
Wild boars (*Sus scrofa*)
Large predators:
Brown bear *(Ursus arctos)*
Wolf *(Canis Lupus)*
Wolverine *(Gulo gulo)*
Lynx *(Lynx lynx)*

12. Bush meat:

Moose and other artiodactyls:
Moose *(Alces alces)*
White-tailed deer (*Odocoileus virginianus*)
Fallow deer (*Dama dama*)
Roe deer *(Cervus elaphus)*
Wild forest reindeer (*Rangifer tarandus fennicus*)
Mouflon *(Ovis musimon)*
Wild boars (*Sus scrofa*)
Beavers *(Castor fiber)*
Hares:
Arctic hare (*Lepus timidus*)
European hare *(Lepus europaeus)*
Grouse:
Capercaillie *(Tetrao urogallus)*
Black grouse *(Tetrao tetrix)*
Hazel grouse *(Bonasia bonasia)*
Willow grouse *(Lagopus lagopus)*

14 Table T14 – Value of non-wood forest product removal

14.1 FRA 2005 Categories and definitions

The following categories of non-wood forest products have been defined:

Category
Plant products / raw material
1. Food
2. Fodder
3. Raw material for medicine and aromatic products
4. Raw material for colorants and dyes
5. Raw material for utensils, handicrafts & construction
6. Ornamental plants
7. Exudates
8. Other plant products
Animal products / raw material
9. Living animals
10. Hides, skins and trophies
11. Wild honey and bee-wax
12. Bush meat
13. Raw material for medicine
14. Raw material for colorants
15. Other edible animal products
16. Other non-edible animal products

14.2 National data

14.2.1 Data sources

References to sources of information	**Quality (H/M/L)**	**Variable(s)**	**Year(s)**	**Additional comments**
Finnish Statistical Yearbook of Forestry 2003. METLA, Finland. (Original data source: Food facts Ltd)	M	Value of wild berries and mushrooms	1988 - 2003	
Finnish Statistical Yearbook of Forestry 2003. METLA, Finland. (Original data source: Finnish Game and Fisheries Research Institute)	M	Value of hides, skins and trophies Bush meat	1988 - 2003	
Finnish Statistical Yearbook of Forestry 2003. METLA, Finland. (Original data source: Board of Customs)	H	Value of raw material for utensils, handicrafts & construction (Lichen export)	1988 - 2003	
Finnish Statistical Yearbook of Forestry 2004. METLA, Finland.	M	Value of Christmas trees	2000, 2005	

14.2.2 Classification and definitions

National class	Definition
FRA 2005 classes applied	FRA 2005 definitions used

Note: If different national data sources use different classes and definitions, a table such as above is needed for each relevant data source.

14.2.3 Original data

NWFP products	Currency	Value		
1. Food		**1990**(1)	**2000**(1)	**2005**(1)
Wild berries	1 000 €	49 073	39 868	43 744
Mushrooms	1 000 €	13 860	16 655	16 655
Wild herbs	1 000 €	NDA	3 364	3 364
Sum. 1. Food	1 000 €	**62 933**	**59 887**	**63 763**
5. Raw material for utensils, handicrafts & construction				
LICHEN	1 000 €	1 490	1 374	1 400
6. Ornamental plants				
CHRISTMAS TREES	1 000 FIM(2) / € (3)	10 000	7000	7000

Footnote:
1. The values for 1990 and 2000 are averages of years 1988-1992 and 1998-2002 respectively, and the figures for 2005 are forecasts.
2. Unit for Christmas trees in 1990 is 1000 FIM.
3. Unit for Christmas trees in 2000 and 2005 is 1000 €.

NWFP products	Currency	Value		
		1990(1)	**2000**(1)	**2005**(1)
10. Hides, skins and trophies	1 000 FIM(2) / € (3)	15 434	2 916	2 916
12. Bush meat				
Moose and other artiodactylus	1 000 FIM(2) / € (3)	176 735	41109	41 109
Hares	1 000 FIM(2) / € (3)	20 598	3 396	3 159
Grouse	1 000 FIM(2) / € (3)	28 963	2 904	2 904
Sum 12. Bush meat	1 000 FIM(2) / € (3)	**226 296**	**47 409**	**47 409**
15. Other edible animal products				
Reindeer husbandry (meat)	1 000 €	NDA	16 189	16 819

Footnotes:
1. The values for 1990 and 2000 are an average of years 1988-1992 and 1998-2002, and the figures for 2005 are forecasts.
2. Unit for values of NWFP products in categories 10. and 12. in 1990 is 1000 FIM.
3. Unit for values of NWFP products in categories 10. and 12. in 2000 and 2005 is 1000 €.

The value for Wild herbs in the FRA Category "Food" is same as in the FRA2000 reporting. The amount (kg) of wild herbs collected from Forest and OWL is not available and therefore not reported in the T13.

In the original data source, the calculated value of bag is reported as a total for certain animal or group of animals, but not separately for meat and other animal products such as hides, skins and trophies. Therefore, the value of animals or group of animals (moose and other artiodactyls, beaver and bear) that belong to both categories (10 and 12) are reported only in one category: The value of beavers is included in the category 10. Hides, skins and trophies, and the value of moose and other artiodactyls are included in the category 12. Bush meat. The value of bear was not available, only the bag as individuals (T13).

14.3 Analysis and processing of national data

14.3.1 Estimation and forecasting

The prices of the year 1990 that were in FIM were changed to USD using the exchange rate of 3.8314 FIM/USD (an average rate in 1990). The prices in € were changed to USD using the exchange rates given in the Appendix 4 in guidelines. Because the year 1990 was not listed there, the factor 0.644 €/USD (based on the fixed rate 5,94573 FIM/€ and 3.8314 FIM/USD) was used to convert values to USD. For the year 2005 the exchange rate of 2003 was used.

14.4 Reclassification into FRA 2005 classes

Not needed.

14.5 Data for National reporting table T14

FRA 2005 Categories	**Value of the of NWFP removed (1000 USD)**		
	1990	**2000**	**2005**
Plant products / raw material			
1. Food	97 663	55 709	80 509
2. Fodder	NDA	NDA	NDA
3. Raw material for medicine and aromatic products	NDA	NDA	NDA
4. Raw material for colorants and dyes	NDA	NDA	NDA
5. Raw material for utensils, handicrafts & construction	2 312	1 278	1 768
6. Ornamental plants	2 610	6 512	8 838
7. Exudates	NDA	NDA	NDA
8. Other plant products	NDA	NDA	NDA
Animal products / raw material			
9. Living animals	NDA	NDA	NDA
10. Hides, skins and trophies	4 028	2 713	3 682
11. Wild honey and bee-wax	NDA	NDA	NDA
12. Bush meat	59 064	44 101	59 859
13. Raw material for medicine	NDA	NDA	NDA
14. Raw material for colorants	NDA	NDA	NDA
15. Other edible animal products	NDA	NDA	NDA
16. Other non-edible animal products	NDA	NDA	NDA
TOTAL	**165 677**	**125 958**	**175 892**

15 Table T15 – Employment in forestry

15.1 FRA 2005 Categories and definitions

Category	Definition
Primary production of goods	Employment in activities related to primary production of goods, like industrial roundwood, woodfuel and non-wood forest products.
Provision of services	Employment in activities directly related to services from forests and woodlands.
Unspecified forestry activities	Employment in unspecified forestry activities.

15.2 National data

15.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Finnish Statistical Yearbook of Forestry 2003. METLA, Finland.	H	Number of people employed by forestry	1990 and 2000	

15.2.2 Classification and definitions

National class	Definition

Note: If different national data sources use different classes and definitions, a table such as above is needed for each relevant data source.

15.2.3 Original data

Year	Employed by forestry, 1000 persons
1990	39
2000	24

15.3 Analysis and processing of national data

15.3.1 Estimation and forecasting

Not needed.

15.4 Reclassification into FRA 2005 classes

Not needed.

15.5 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	2000
Primary production of goods	NDA	NDA
Provision of services	NDA	NDA
Unspecified forestry activities	39	24
TOTAL	**39**	**24**

15.6 Comments to National reporting table T15

Only statistics on employed persons in forestry are available, the data on employment are not distributed into categories of staff or primary activities.

16 Thematic reporting tables

Finland as a member of the Ministerial Conference for the Protection of Forest in Europe (MCPFE) already reports on Criteria and Indicators issues to this regional process. In order to avoid double reporting, Finland will not provide an additional report by thematic areas.