Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT

COUNTRY REPORTS

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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).

The Global Forest Resources Assessment process is coordinated by the Forestry Department at FAO headquarters in Rome. The contact person for matters related to FRA 2005 is:

Mette Løyche Wilkie
Senior Forestry Officer
FAO Forestry Department
Viale delle Terme di Caracalla
Rome 00100, Italy

E-mail: Mette.LoycheWilkie@fao.org

Readers can also use the following e-mail address: fra@fao.org

Report preparation and contact person

This report has been prepared by:

Name: Dr. Andrey Filipchuk (officially nominated National Correspondent to FRA)
Organization: VNIILM of MNR
Email: afilipchuk@yandex.ru

Name: Dr. Boris Moiseev
Organization: VNIILM of MNR
Email: bmoiseev@yandex.ru

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INTRODUCTION

The history of forest management in Russia stretches for more than 200 years. According to the edict of Emperor Pavel I the Forest Department was set up in 1798. The established structure of forest management has proved to be a success as the main principles have been observed up to the present. According to the current legislation, the state forest administration includes forest use, monitoring and control activities, as well as protection and reforestation throughout the country. Management and administration functions are carried out by the Government of the Russian Federation, executive bodies of the subjects of the Russian Federation, and specially authorized state forest administration bodies. Specially authorized state forest administration bodies are represented by the Ministry of Natural Resources (MNR Russia) and the Federal Agency of Forestry (Rosleshoz).

In Russia, the notion "forest resources" is associated with the "Forest Fund" concept. The term itself was formed resulting from the history of the state forest management. The Forest Fund comprises lands that are covered with forest vegetation (forested lands) or may be potentially covered (unforested lands, non-forest lands). Forest Fund lands are managed for forestry purposes.

All Forest Fund lands and forests on the defense lands are under State Federal ownership according to the Forest Code of the Russian Federation (1997). The federal law admits to transfer a part of the Forest Fund to the property of Federation's members. The civil legislation and the Forest code guarantee to the citizens the right on free stay in the Forest Fund and in the forests not included therein. Parcels of the Forest Fund may be made available for use by citizens and legal entities according rights of lease, free-of-charge use, concession and short-term use.

The Ministry of Natural Resources (MNR) manages 95% of the total area of the Russian Federation's forests. The remaining part is managed by other ministries and agencies (Table 1).

***Table 1*. Basic data on the Forest Fund and forests not included therein (as for 01.01.2003)**

Forest Fund lands and other forests	Area of the Forest Fund lands and forests not included therein, 1000 hectares			Standing volume of stock, million m^3
	Total	Forest lands	Stocked forest lands	
Forest Fund	**1173089.0**	**878137.5**	**771762.8**	**81538.26**
Parts under the administration of:				
Ministry of Natural Resources (MNR)	1132282.2	838124.4	733150.0	76060.11
Ministry of Agriculture	40466.1	39695.1	38335.5	5421.44
Ministry of Education	340.7	318.0	277.3	56.71
Forests not included in the Forest Fund	**5912.9**	**4837.7**	**4381.8**	**591.84**
Parts under the administration of:				
Ministry of Defence	4736.4	3821.6	3434.0	465.97
Urban forests	1176.5	1016.1	947.8	125.87
Total forests	**1179001.9**	**882975.2**	**776144.6**	**82130.10**

The State Account of the Forest Resources (SAFR) is carried out in order to organize a rational use, control, protection and reproduction of the Russian forest, to survey regularly its changes in quantity and quality. It provides a reliable information on the Forest Fund for Bodies of State authority of the Russian Federation and Federation's members, bodies of local self-administration, interested citizens and legal entities. The SAFR data is used when compiling the State forest cadastre.

The SAFR is based on the information received at inventory and planning operations, updated for the moment of account. Cuts, new plantations, forest parcels damaged by forest fires, pests and diseases, other changes in areas and standing volume are taken into account. Till 1999 the SAFR was carried out once in 5 years. Such periodicity was determined earlier by necessity of having summary characteristics of Regions, Territories and Republics to the beginning of the next five-year plan. Now, taking into account a dynamic development of the society and an increased necessity of updated information, the SAFR is carried out every year, but for MNR forests only (95%).

Russia is the largest forest power. The Forest Fund area of the Russian Federation is about 12 million km^2; the lands covered with forest vegetation occupy about 8 million km^2. The forest cover rate is about 45% that is much higher than on the average on all countries of the world. About 25% of global stocks of standing timber are concentrated in Russia. As regards forests of boreal and moderate zones Russia is an absolute monopolist having over 1/3 of world resources. Nearly 600 m^3 of standing timber are per capita in the Russian Federation.

Rather favorable natural conditions for forests growing are available almost on 60% of the land area of Russia as a whole. In total on the country 67% of forest lands are suitable for coniferous forests growing, 17% are scarce coniferous forests. Zones of taiga and tundra make 78% of Forest Fund lands.

Depending on their economic importance and functional features all forests are subdivided into three groups: the first (1) group - forests which principal assignment is to perform water conservation, protective, sanitary, hygienic and health improving functions; the second (2) group - forests in areas with high density of the population, having both protective and limited exploitation value, and also forests with insufficient raw material resources and with imposed strict mode of forest use; the third (3) group - forests of forest-rich areas having mainly operational importance and intended for continuous meeting of requirements of economy in timber, without damaging the protective properties of these forests.

Fig.1. Predominantal tree species in Russian forests.

The forests of the first group occupy 272 million ha (22%), those of the second - 90 million ha (6%), those of the third - 818 million ha (72%). These last years one states the tendency of an increase in the area of the first group forests. This process evidently testifies a change of state forest policy priorities towards preservation and improvement of environmental functions of forests.

The main forest-forming species - Larch, Pine, Fir, Siberian Pine, Oak, Beech, Birch, Aspen, etc. occupy more than 90% of lands covered with forest vegetation (fig.1). Other forest species (Pear, Chestnut, Walnut, Manchurian Walnut, etc.) occupy less than 1% of lands; other area is covered with shrubs (Dwarf Siberian Pine, Dwarf Birch, etc.). The main forest-forming species are grouped in management groups (for MNR only): coniferous (area – 514.7 million ha, growing stock - 58.5 billion m^3), broad-leaved (area - 18.2 million ha, growing stock - 2.0 billion m^3), and small-leaved (area - 125.9 million ha, growing stock - 14.0 billion m^3).

The most important parameter of productivity and state of forests is NAI - Net annual increment (tab. 2). For last 50 years it steadily is increased: with 810 mill. $м^3$ in 1956 up to 994 mill. $м^3$ in 2003.

***Table 2*. Net annual increment (NAI) and Net ecosystem production (NEP) of Carbon in Russian forests (for stocked forest lands only).**

Attribute	Units	1988 yr	1998 yr	2003 yr
Net annual increment (NAI)	Mill. m^3/yr	938,0	970,4	993,8
Natural losses (tree fall)	Mill. m^3/yr	640,0	662,1	678,0
Gross annual increment (GAI)	Mill. m^3/yr	1578,0	1632,5	1671,9
GAI of biomass	Mill. t/yr	725,9	750,9	769,1
Expansion factor (roots, branches)	t/m3	1,5	1,5	1,5
Net ecosystem productivity (NEP)	Mill. t /yr	1088,8	1126,4	1153,6
NEP of carbon	Mill. t C/yr	544,4	563,2	576,8

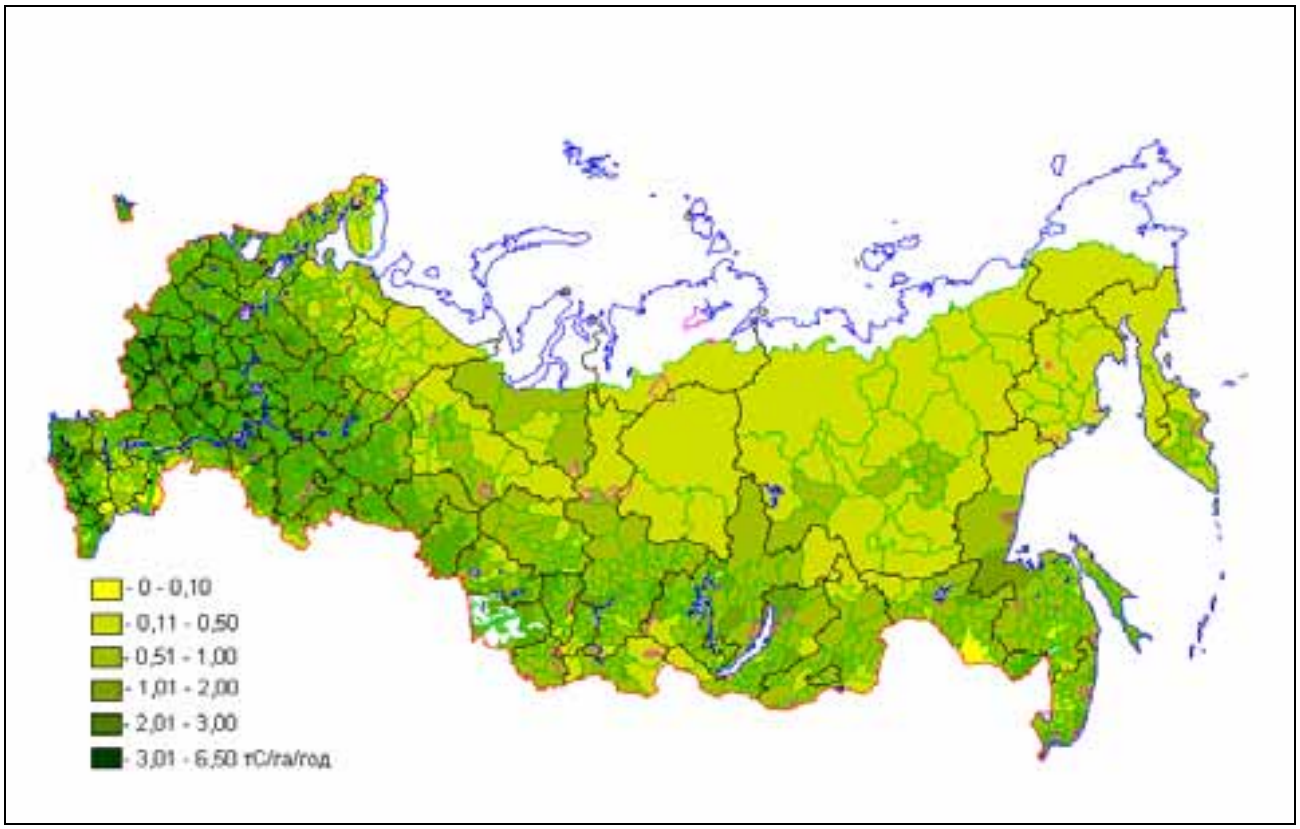

Fig.2. Density of Net Ecosystem Productivity (NEP) of carbon per 1 ha, t C / ha*yr.

Unfortunately, this major parameter was not included in the FRA-2005 tables. Without it is impossible to calculate the Carbon balance. The attempt of account of an accretion of Carbon on a difference in stores in forests and soils will lead to pitiable results, as the absolute value of measurement error of a C-store in 10 … 20 times is surpassed by value of annual C-increment (fig.2).

Now problem of forest fires has left for frameworks of forestry and became a part of a problem of preservation of all environments, i.e. ecological problem. In Russia forest patrol from fires provides:

- terraneous forest preservation on the area about 16 % from the area of forest resources;
- terraneous forest guarding preservation in combination to air patrolling for detection of forest fires – on the area about 11 %;
- air guarding preservation (detection and quenching of forest fires by air methods) – on the area about 47 %.

The not guarded part of forests compounds more than 300,0 million ha or about 26 % from the area of lands of forest resources, on which one the control behind fire conditions implements on snapshots from space sputniks.

The average amount forest area that is annually burned by forest fires totals about one million ha and varies considerably, depending on climatic conditions. Creeping fires are the most common and they burn away about 90% of the total forest fires area.

According to the forest flammability analysis, over the past 10 years, up to 72% of forest fires are caused by humans, about 7% result from agricultural burnings, 7% originate from lightning and 14% of fires are due to other causes.

Forest pathology inspection is carried out to detect pests, diseases and other pathological damage and aims to assess the health and condition of the Forest Fund. Forest pathology experts, working for the forest protection divisions of the Ministry of Natural Resources, implement the above-mentioned inspections. The inventory is conducted in:

- the areas which are under the mass outbreaks of pests and diseases;
- the sites damaged by windfalls, fires and other natural calamities;
- forests suffering from industrial pollution.

Efficient and flexible monitoring and control is annually performed over an area of 7-9 mill. ha. In addition, forest pathology expeditions conduct surveys in the areas where there are complex and unfavorable pathology conditions (almost 8 mill. ha).

Traditionally, the notion “forest use” implies forest harvesting and logging. Timber is harvested at the final felling of mature and aged stands. Various assortments are produced which are needed for both domestic and world markets.

A grounded and reasonable volume of timber felled, which is statistically calculated, is referred to as the Annual Allowable Cut (AAC). In the past years, AAC totaled up to 500 mill.m^3, including 300 mill.m^3 for the coniferous category. The ratio of AAC and actual harvest illustrates the “state-of-the-art” in all branches of the forestry sector. In spite of the fact that in 1999 there was an increase in forest harvesting (for the first time over the past few years), only 20% of AAC was actually logged. This is a clear sign of deep and prolonged structural and financial crises in the forest sector.

The overwhelming majority of forests in Russia are of natural origin and only 3% of lands covered with forest vegetation are artificially planted. Forest restoration is closely linked to harvesting. Reduction of harvesting volumes for the last 10 years has caused the decrease of clear felled areas as the main forest restoration sites.

The forest restoration volumes from the mean annual actual harvest of 0,5 mill. ha (1997-2002). In total, reforestation measures in Russia are carried out in accordance with the established standards.

Forest resources include both timber and non-timber forest products. Minor forest products, secondary forest use, and hunting are of special importance for the people, who closely depend on forests. Traditionally, minor forest products include: fodder, technical raw materials, and decorative raw materials for ornamental and applied art.

Technical raw materials include mainly tanning substances and natural dyes. The most popular fodder is vitamin flours produced from coniferous twigs and is used as supplementary fodder for livestock.

Forests growing at permafrost soils are of quite low productivity. However, they are abundant in terms of non-timber forest products and bear significant social and economic value. According to experts, the estimated annual commercial yield of berries (cranberry, cowberry, blueberry) makes up 4 mill. tons and mushrooms make up about 2.1 mill. tons. The stocks of medicinal plants (*Panax quinquefolium, Eleutherococcus senticosus, Rhodiola rosen, Schizandra chinensis*, etc.) are of great demand both at the domestic and international markets and are extensively growing in the forests. The economic value of non-timber forest products and services offered by forests, growing at permafrost soils, is higher than the growing timber value. Strengthening and developing recreational values, tourism, hunting and nature protection is in many cases more profitable than harvesting.

Reporting Tables

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	Years	Additional comments
Forest resources USSR (under the count on 01.01.1998). The statistical collection / Goscomles USSR,M., 1990. .(in Russian).	H	partial coverage	1990	Forest lands
Forest resources of Russia (as of 01.01.1998). Vademecum / VNIIClesresurs, M., 1999.(in Russian).	M	partial coverage	2000	Forest lands
Forest resources of Russia (as of 01.01.2003).Vademecum / VNIILM, M., 2003. (in Russian).	M	partial coverage	2005	Forest lands
The state (national) report on a status and use of lands of Russian Federation in 2001/ Roszemkadastr, M., 2002. (in Russian).	M	partial coverage	1990 2000 2005	Other lands with tree cover

1.2.2 Classification and definitions

National classification	Definition
FORESTS	
Forest lands	The forest lands include stocked forest lands and unstocked forest lands. This term completely corresponds to definitions "Forest + Other wooded land" in the FAO terms.
Stocked forest lands, included:	- consist from closed stands of trees and bushes with relative crown density more than 25 %.
Forest tree stands	- aggregate of trees and shrubs forming a forest cover.
Bushes (shrubs)	- bush tangle usually having height up to 6 m and less.
Unstocked forest lands	- include sparse stands with crown density of trees and bushes less than 25 %, cutting down, burned forest lands and glade.
Urban forests	Urban forest parks include stocked forest lands and unstocked forest lands
NON-FORESTS	
Fruit plantations	Fruit trees in agricultural production systems
Field-protective belts	Field-protective trees in agricultural production systems

1.2.3 Original data, 1000 ha:

National classification	1988 yr	1998 yr	2003 yr
Forests			
Stocked forest lands	771109,2	774250,9	776144,6
Included:			
forest tree stands	723693,7	702644,3	702975,5
bushes (shrubs)	47415,5[4)]	71606,6	73169,1
Unstocked forest lands	112984,4	107723,3	106830,6
Forest lands	**884093,6**	**881974,2**	**882975,2**
included : Urban forest	153,0	1099,1	1016,1
Non-forests			
Fruit plantations	1820,0	1 864,4	1857,7
Field-protective belts	3000,0[1)]	2 860,3	2840,8
Other non-forest lands	799936,4	802151,1	801176,3
Total land area [2)]	**1688850,0**	**1688850,0**	**1688850,0**
Inland water bodies[2)]	18690,0	18690,0	18690,0
Total for country[3)]	**1707540,0**	**1707540,0**	**1707540,0**

Notes:
1). Assessment based on expert knowledge.
2). FAOSTAT data.
3). FAOSTAT and Russian Statistical Year-book (2003) data.
4). 27574.3 th. ha of Dwarf Siberian Pine stands (stocked forest lands) was included to a category "forest tree stands" in SAFR-1988. It has come in category "bushes" after SAFR-1993.

1.3 Analysis and processing of national data:

1.3.1 Calibration:

Source	Inland water bodies	Total land area	Total country area
National data	**18690,0**	**1688850,0**	**1707540,0**
FAOSTAT	**18690,0**	**1688850,0**	**1707540,0**

Note:
There is no need to perform calibration since the national land area data matches the FAOSTAT land area. However under the data the State (national) report on a status and usage of lands of Russian Federation in 2001 (2002) total areas of Russia compound 1709824,2 thousand ha.

1.3.2 Estimation and forecasting:

The extrapolation and forecast of the national data cannot be carried out, since the data of forest management are heterogeneous for 1800 forest enterprises, and their prescription realization changes from 5 till 40 years.

1.4 Reclassification into FRA 2005 classes:

National classes	FRA 2005 Categories:				
	Forest	OWL	Other Land	Total	OLWTC
Forests:					
Forest tree stands	99.9%	0.1%*		100%	
Bushes (shrubs)		100%		100%	
Unstocked forest lands	99.9%	0.1%*		100%	
Non-forests:					
Fruit plantations			100%	100%	100%
Field-protective belts			100%	100%	100%
Other Non-forest Land			100%	100%	
Total land area				100%	

Notes:
OWL = Other wooded land
OLWTC = Other land with tree cover. This is a subcategory of "Other land", hence the percentage given in this reclassification matrix refers to the percentage of the area of "Other land" that has tree cover.

Result of reclassification for example SAFR- 2003:

National categories	FRA 2005 Categories:				
	Forest	OWL	Other Land	Total	OLWTC
Forests:					
Forest tree stands	702027,7	947,8*)		702975,5	
Bushes (shrubs)		73169,1		73169,1	
Unstocked forest lands	106762,3	68,3*)		106830,6	
Non-forests:					
Fruit plantations			1857,7	1857,7	1857,7
Field-protective belts			2840,8	2840,8	2840,8
Other Non-forest Land			801176,3	801176,3	
Total land area	**808790,0**	**74185,2**	**805874,8**	**1688850,0**	**4698,5**

Note: *) All Urban Forests classified as “Other wooded land”.

1.5 Data for National reporting table T1

FRA 2005 categories	Area (1000 hectares)		
	1990	**2000**	**2005**
Forest	808949,9	809268,5	808790,0
Other wooded land	75143,7	72705,7	74185,2
Other land	804756,4	806875,8	805874,8
...of which with tree cover	4820,0	4724,7	4698,5
Total land area	**1688850,0**	**1688850,0**	**1688850,0**
Inland water bodies	18690,0	18690,0	18690,0
Total for country	**1707540,0**	**1707540,0**	**1707540,0**

1.6 Comments to National reporting table T1:

1.The database of the State account of forest resources (SAFR) of Russia for 1988 were used for the characteristic of FRA –1990; the SAFR database of 1998 - for FRA-2000; the SAFR database of 2003 - for FRA-2005 without extrapolations.

2. All area (bushes) of Dwarf Siberian Pine (27574,3 th. ha) were classified as Forest in the SAFR 1988 while in subsequent SAFRs they were classified as bushes (OWL). The figure for 1990, based on SAFR 1988, has therefore been adjusted in order to correspond to the definitions used for SAFR 1998 and SAFR 2003.

3.The national data on forests of Russia given in TBFRA 2000 are based on SAFR -1993 years, which data are incomplete and have low reliability. The causes lay in range of political and economic instability of Russia in this period. Therefore distinctions exist between our data for 2000 (FRA2005) and national data TBFRA 2000 (FRA 2000).

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
Forest Code of the Russian Federation, 1997 (in Russian)	H	total	For 2000 only	It essentially variates now

2.3 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	0	0	0	0
Public ownership	808949,9	809268,5	75143,7	72705,7
Other ownership	0	0	0	0
TOTAL	**808949.9**	**809268,5**	**75143,7**	**72705,7**

2.4 Comments to National reporting table T2:

All Forest Fund lands and forests on the defense lands are under State Federal ownership according to the Forest Code of the Russian Federation (1997). The federal law admits to transfer a part of the Forest Fund to the property of Federation's members. The civil legislation and the Forest code guarantee to the citizens the right on free stay in the Forest Fund and in the forests not included therein. Parcels of the Forest Fund may be made available for use by citizens and legal entities according rights of lease, free-of-charge use, concession and short-term use.

3 Table T3 – Designated function of Forest and OWL

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	Years	Additional comments
Forest resources USSR (under the count on 01.01.1998). The statistical collection / Goscomles USSR, M., 1990. (in Russian).	H	total coverage	1990	Forest lands
Forest resources of Russia (as of 01.01.1998). Vademecum / VNIIClesresurs, M., 1999 (in Russian).	M	total coverage	2000	Forest lands
Forest resources of Russia (as of 01.01.2003).Vademecum / VNIILM, M., 2003.(in Russian).	M	total coverage	2005	Forest lands

The database of the State account of forest resources (SAFR) of Russia for 1988 were used for the characteristic of FRA –1990; the SAFR database of 1998 - for FRA-2000; the SAFR database of 2003 - for FRA-2005 without extrapolations.

3.2.2 Classification and definitions

National classification declassification	Definition
First (1) group*	forests which principal assignment is to perform water conservation, protective, sanitary, hygienic and health improving functions;
Second (2) group	forests in areas with high density of the population, having both protective and limited exploitation value, and also forests with insufficient raw material resources and with imposed strict mode of forest use;
Third (3) group	forests of forest-rich areas having mainly operational importance and intended for continuous meeting of requirements of economy in timber, without damaging the protective properties of these forests.

NOTE:

* - According to the location and functions in SAFR-2003, the First group of forests are divided into the following categories (for MNR forest land only, 1000 ha):

Strict nature reserves (zapovedniks), including biosphere reserves = 12097.6 ;
National parks=4206.1;
Nature parks=93.3;
Nature monuments=90.8;
Forest stands of special value=4547.6;
State forest belts=111.9;
Forests of the I, II, and III zones of the sanitary protection of the resorts=614.7.
Forest stands of scientific and historical importance=156.7;
Genetic wood reserves=76.1;
Fruit forests=5.0;
Forests of nut producing areas=9903.5;
Forests of the sanitary zones of water supply sources=1245.5;
Sub-tundra forests=36840.3;
Restricted forest strips shadowing of spawning ground of valuable fishes=38449.0.
Soil protected forests=9373.7;

Restricted forest stripes along rivers, lakes, water reservoirs and other water bodies=21487.5;
Protected forests along the of the federal, republic and regional railroads=3226.6;
Lentochny bor (pine forest belt)=111.9;
Forests of desert and semi desert areas=8911.9;
Forests of the green zones around settlings=11722.5;

Total of First group of forests = 163272.2 th. ha

3.3 Reclassification into FRA 2005 classes

FRA 2005 Categories / Designated function	National categories
Forest:	
Production	Forests of 2 and 3 groups having mainly wood production importance.
Protection of soil and water	Forests of 1 group carrying out soil and water protective of function.
Conservation of biodiversity	Forests of 1 group of strict reservations, national parks and natural monuments.
Social services	Forests of 1 group of green zones of settlements and preservation of resorts.
Multiple purpose	Other forests of 1 group.
No or unknown function	NDA
Other wooded land:	
Production	NDA
Protection of soil and water	NDA
Conservation of biodiversity	NDA
Social services	Urban forests
Multiple purpose	Bushes (shrubs)

3.4 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	664754,3	623120,0	622348,7	NDA	NDA	NDA
Protection of soil and water	58695,4	70385,8	70555,7	NDA	NDA	NDA
Conservation of biodiversity	11814,5	16190,2	16487,8	NDA	NDA	NDA
Social services	17376,2	11827,0	12337,2	NDA	NDA	NDA
Multiple purpose	56309,5	87745,5	87060,6	not **appl.**	not **appl.**	not **appl.**
No or unknown function	0,0	NDA	NDA	not **appl.**	not **appl.**	not **appl.**
Total - Forest	**808949,9**	**809268,5**	**808790,0**	**not appl.**	**not appl.**	**not appl.**
Other wooded land:						
Production	0,0	NDA	NDA	NDA	NDA	NDA
Protection of soil and water	NDA	NDA	NDA	NDA	NDA	NDA
Conservation of biodiversity	NDA	NDA	NDA	NDA	NDA	NDA
Social services	153,9	1099,1	1016,1	NDA	NDA	NDA
Multiple purpose	74989,8	71606,6	73169,1	not **appl.**	not **appl.**	not **appl.**
No or unknown function	0,0	NDA	NDA	not **appl.**	not **appl.**	not **appl.**
Total - Other wooded land	**75143,7**	**72705,7**	**74185,2**	**not appl.**	**not appl.**	**not appl.**

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	Years	Additional comments
Forest resources USSR (under the count on 01.01.1998). The statistical collection / Goscomles USSR, M., 1990. (in Russian).	H	total coverage	1990	Forest lands
Forest resources of Russia (as of 01.01.1998). Vademecum / VNIIClesresurs, M., 1999 (in Russian).	M	total coverage	2000	Forest lands
Forest resources of Russia (as of 01.01.2003).Vademecum / VNIILM, M., 2003.(in Russian).	M	total coverage	2005	Forest lands

The database of the State account of forest resources (SAFR) of Russia for 1988 were used for the characteristic of FRA –1990; the SAFR database of 1998 - for FRA-2000; the SAFR database of 2003 - for FRA-2005 without extrapolations.

4.2.2 Classification and definitions

National classification	Definition
Primary forests	Climax forests where there are ecological processes are not significantly disturbed.
Secondary forests	Forests arisen on a place of primary forests as a result of fellings or fires.
Productive plantation	Forests established through planting or seeding mainly for wood production.
Protective plantation	Forests established through planting or seeding mainly for protective services.

4.3 Reclassification into FRA 2005 classes

FRA 2005 Categories	National categories
Forest	
Primary	Mature and overmature stands of coniferous tree species (boreal climax of succession).
Modified natural	All other forest lands except for forest cultures.
Semi-natural	NDA
Productive plantation	Forest cultures of 2 and 3 groups.
Protective plantation	Forest cultures of 1 group.
Other wooded land	
Primary	Bushes (shrubs)
Protective plantation	Urban forests

4.4 Data for National reporting table T4

FRA 2005 Categories	Area (1000 hectares)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Primary*)	241725,7	258130,8	255469,8	74989,8	71606,6	73169,1
Modified natural*)	554573	535777,3	536357,7	NDA	NDA	NDA
Semi-natural	NDA	NDA	NDA	0	0	0
Productive plantation	9244,2	10712,3	11887,5	0	0	0
Protective plantation	3407,0	4648,1	5075,0	153,9	1099,1	1016,1
TOTAL	**808949,9**	**809268,5**	**808790,0**	**75143,7**	**72705,7**	**74185,2**

NOTE: *) - Assessment based on expert knowledge

4.5 Comments to National reporting table T4

The area of primary forests is not taken into account in our forest management, therefore these data is not present in the State count of forest resources. We assumed that all mature and over-mature coniferous stands of trees as primary, as they are a climatic climax in terrain of Russia.

Therefore the cause of negative change of primary forest in the period 2000-2005 can be explained with the change occurred in 1995 to the forest classification system. Before 1995 a forest was classified as “coniferous forest” if needleaves trees occupied 30-40% of the crown cover, while after 1995 the threshold was increased to 50% (or more). The different classification system adopted after 1995, thus brought to a decrease of the area occupied by the coniferous forests, which does not correspond to a real decrease of forest area.

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	Years	Additional comments
Forest resources USSR (under the account on 01.01.1998). The statistical collection / Goscomles USSR, M., 1990. (in Russian).	H	total coverage	1990	Growing Stock
Forest resources of Russia (as of 01.01.1998). Vademecum / VNIIClesresurs, M., 1999 (in Russian).	M	total coverage	2000	Growing Stock
Forest resources of Russia (as of 01.01.2003). Vademecum / VNIILM, M., 2003.(in Russian).	M	total coverage	2005	Growing Stock
Zagreev V.V. et al. All-union specifications for taxation of forests / M., Kolos, 1992 (in Russian).	H		1990-2005	Complementary information

The database of the State account of forest resources (SAFR) of Russia for 1988 were used for the characteristic of FRA –1990; the SAFR database of 1998 - for FRA-2000; the SAFR database of 2003 - for FRA-2005 without extrapolations.

5.2.2 Classification and definitions

National classification	Definition
Growing stock	Volume over bark of all living trees more than 4 cm in diameter at breast height. Includes the stem above stump and excluded branches.
Growing stock possible for operation	The part of the growing stock of species that are considered as potentially commercial. Include only forests where removal of wood is permited and economically feasible.

5.3 Reclassification into FRA 2005 classes

FRA 2005 Categories	National categories
Growing stock	Growing stock on the stocked forest land only*)
Commercial growing stock	Growing stock possible for operation

NOTE: *) -The Growing stock of wood is not determined on the unstocked forest lands (not important).

5.4 Data for National reporting table T5

FRA 2005 category	Volume (million cubic meters over bark)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Growing Stock	80039,64	80270,39	80479,05	1604,82	1593,30	1651,05
Commercial Growing Stock	47595,15	40279,39	39629,55	0	0	0

Appendix to Reporting table T5

Item	Unit	Complementary information
1. Minimum diameter at breast height of trees included in Growing stock (X)	cm	4
2. Minimum diameter at the top end of stem (Y) for calculation of Commercial growing stock	cm	6
3. Minimum diameter of branches included in Growing stock (W)	cm	No*)
4. Minimum diameter at breast height of trees in Commercial growing stock (Z)	cm	8
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	No

NOTE:
*) – branches and stumps are not included in the growing stock.

5.5 Comments to National reporting table T5

The estimates of growing stock are made for Stocked forest land only.

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	Years	Additional comments
Forest resources USSR (under the count on 01.01.1998). The statistical collection / Goscomles USSR,M., 1990. (in Russian).	H	total coverage	1990	Growing Stock
Forest resources of Russia (as of 01.01.1998). Vademecum / VNIIClesresurs, M., 1999.(in Russian).	M	total coverage	2000	Growing Stock
Forest resources of Russia (as of 01.01.2003).Vademecum / VNIILM, M., 2003.(in Russian).	M	total coverage	2005	Growing Stock
Zagreev V.V. et al. All-union specifications for taxation of forests / M., Kolos, 1992. (in Russian).	M	total coverage	1990-2005	Root-shoot ratio
Bazilevich N.I. A biological productivity of Boreal Eurasia ecosystems - M.: Nauka, 1993. (in Russian)	M	total coverage	1990-2005	Biomass expansion factor
Poluboyarinov O.I. Density of wood. - M., 1976. (in Russian)	M	total coverage	1990-2005	Wood Density

The database of the State account of forest resources (SAFR) of Russia for 1988 were used for the characteristic of FRA –1990; the SAFR database of 1998 - for FRA-2000; the SAFR database of 2003 - for FRA-2005 without extrapolations.

6.3 Analysis and processing of national data

Example of biomass calculation for Stocked forest land 2005:

Species	Growing stock, M m3	Basic density, t / m3	Stem biomass, M t	BEF	AGB, M t	R	BGB, M t	LWB, M t	D/L	DWB, M t	Total, M t
Larch (Larix)	24950,84	0,52	12974,4	1,48	19202,2	0,25	4800,5	24002,7	0,45	10801,2	34803,9
Pine (Pinus)	16202,61	0,42	6805,1	1,37	9323,0	0,3	2796,9	12119,9	0,35	4242,0	16361,8
Birch (Betula)	11549,62	0,51	5890,3	1,30	7657,4	0,2	1531,5	9188,9	0,25	2297,2	11486,1
Spruce (Picea)	10807,36	0,40	4322,9	1,43	6181,8	0,25	1545,5	7727,3	0,40	3090,9	10818,2
Pine siberian stone (Pinus sibirica)	8419,63	0,35	2946,9	1,46	4302,4	0,25	1075,6	5378,0	0,40	2151,2	7529,3
Aspen (Populus tremula)	3331,99	0,40	1332,8	1,32	1759,3	0,2	351,9	2111,1	0,35	738,9	2850,0
Fir (Abies)	2742,84	0,40	1097,1	1,35	1481,1	0,2	296,2	1777,4	0,30	533,2	2310,6
Oak (Quercus)	897,52	0,58	520,6	1,40	728,8	0,3	218,6	947,4	0,25	236,9	1184,3
Lime (Tilia)	598,69	0,35	209,5	1,35	282,9	0,2	56,6	339,5	0,20	67,9	407,3
Beech (Fagus)	228,52	0,58	132,5	1,35	178,9	0,3	53,7	232,6	0,25	58,2	290,8
Remainder of species	749,43	0,46	344,7	1,38	475,7	0,25	118,9	594,7	0,30	178,4	773,1
Total	**80479,05**	**0,45**	**36577,0**	**1,41**	**51573,5**	**0,25**	**12845,9**	**64419,4**	**0,38**	**24395,9**	**88815,4**

NOTES:
BEF – biomass expansion factors;
AGB – above ground tree biomass = Stem biomass × BEF;
R – root factors;
BGB – below ground tree biomass = AGB × R ;
LWB - living wood biomass = AGB + BGB;
D/L - dead-live ratios;
DWB – dead wood biomass = LWB × D/L.

6.4 Reclassification into FRA 2005 classes

FRA 2005 Categories	National categories
Above-ground biomass	Above-ground biomass on the stocked forest lands
Below-ground biomass	Below-ground biomass on the stocked forest lands (≈20…30% from Above-ground biomass)
Dead wood biomass	Dead wood biomass excluded litter biomass (≈20…45% from Living wood biomass)

6.5 Data for National reporting table T6

FRA 2005 category	Biomass (million metric tones oven-dry weight)					
	Forest			Other wooded land*)		
	1990	2000	2005	1990	2000	2005
Above-ground biomass	52103,2	51471,1	51573,5	450,0	400,0	450,0
Below-ground biomass*)	12904,0	12842,4	12845,9	300,0	300,0	300,0
Sub-total of living wood biomass	**65007,2**	**64313,5**	**64419,4**	**750,0**	**700,0**	**750,0**
Dead wood biomass*)	**24633,6**	24456,4	24395,9	750,0	700,0	750,0
TOTAL	**89640,8**	**88769,9**	**88815,4**	**1500,0**	**1400,0**	**1500,0**

NOTES: *) Expert assessments.

6.6 Comments to National reporting table T6

The estimates of biomass are made for Stocked forest land only.

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

Data sources

References to sources of information	Quality (H/M/L)	Variable	Years	Additional comments
B.N. Moiseev & A.N. Filipchuk. Carbon balance for Russian forests // Use and protection of natural resources of Russia, № 4-5, 2003 (in Russian).	M	partial coverage	1990-2000	Carbon stock in forests
Senkin N.I. A database on stores of a humus in soils of Russian regions // www.biodat.ru	L	partial coverage	2000	Humus stock in soils.

7.3 Reclassification into FRA 2005 classes

FRA 2005 Categories	National categories
Carbon in above-ground biomass	Carbon in all living biomass above the soil, including stem, stump, branches, bark.
Carbon in below-ground biomass	Carbon in all living biomass of live roots.
Carbon in dead wood biomass	Carbon in all non-living woody biomass. Dead wood includes wood lying on the surface, dead branches, roots and stumps.
Carbon in litter	Carbon in all non-living biomass in various states of decomposition above the mineral or organic soil. This includes the dead branches (small), bark, seeds and foliage.
Soil carbon	Organic carbon in mineral and organic soils (including peat) to a specified depth = 1 m.

7.4 Data for National reporting table T7

FRA 2005 Category	Carbon (Million metric tones)					
	Forest[1)]			Other wooded land[4)]		
	1990	2000	2005	1990	2000	2005
Carbon in above-ground biomass[2)]	26052	25736	25787	225	200	225
Carbon in below-ground biomass	6452	6421	6423	150	150	150
Sub-total: Carbon in living biomass	**32504**	**32157**	**32210**	**375**	**350**	**375**
Carbon in dead wood	12317	12228	12198	375	350	375
Carbon in litter	4600	4500	4500	NDA	NDA	NDA
Sub-total: Carbon in dead wood and litter	**16917**	**16728**	**16698**	**375**	**350**	**375**
Sub-total: Carbon in living and dead biomass	**49421**	**48885**	**48908**	**750**	**700**	**750**
Soil carbon to a depth of 100 cm[3)]	137000	137000	137000	2000	2000	2000
TOTAL CARBON	**186421**	**185885**	**185908**	**2750**	**2700**	**2750**

NOTES:
1) Carbon data in above-ground, below-ground and dead wood biomass are based on the T6 figure. The T7 table do not include carbon biomass in Unstocked forest lands (≈3400 MtC) in order to be consistent with growing stock estimates (T5) and biomass estimates (T6).
2) Carbon coefficient for biomass = 0,50 tC/t
3) Carbon coefficient for soil humus = 0,57 tC/t.
4) The data on a store of Carbon in OWL, litter and soil are very approximate (expert assessments).

7.5 Comments to National reporting table T7:

The estimates of carbon stock are made for Stocked forest land only.

The estimation of stores of Carbon in forest ecosystems is carried out with the large error (± 20%) and uncertainty. The annual change of a store and carbon balance cannot be determined on these data for the large terrains. The annual change of a store should be defined on the Net annual increment (NAI) data and Biomass expansion factors (see table 16) according to TBFRA-2000 method (ECE/TIM/SP/17).

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 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	Years	Additional comments
The basic parameters of forestry activity MNR for 1988, 1992-2003 years/Roslesinforg, M:, 2004 (in Russian)	L	partial coverage	1988-2002	the data are underestimated

National data from Roslesinforg for forest area of disturbance by fire, 1000 ha:

1988 - 700,12	1993 - 733,61	1998 - 2277,05
1989 - 648,94	1994 - 518,76	1999 - 678,36
1990 - 965,00	1995 - 351,47	2000 - 1240,44
1991 - 569,00	1996 - 1807,05	2001 - 868,05
1992 - 522,29	1997 - 669,27	2002 - 1273,50

8.3 Reclassification into FRA 2005 classes

FRA 2005 Categories	National categories
Disturbance by fire	Disturbance caused by wildfire, independently whether it broke out inside or outside the forest
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 bacteria, fungi or virus.
Other disturbance	Disturbance caused by other factors than fire, insects or diseases.

8.4 Data for National reporting table T8

FRA-2005 category	Average annual area affected (1000 hectares)			
	Forests		Other wooded land	
	1990[2)]	2000[2)]	1990	2000
Disturbance by fire [1)]	681,1	1267,5	NDA	NDA
Disturbance by insects	1717,6	4953,0	NDA	NDA
Disturbance by diseases	124,2	956,8	NDA	NDA
Other disturbance	174,0	508,1	NDA	NDA
TOTAL	**2696,8**	**7685,3**	NDA	NDA

NOTES:
1) Only for MNR forest lands of Russia (without strict reservations).
2) The year 1990 and 2000 in this table represent five-year averages to take care of annual fluctuations.

8.5 Comments to National reporting table T8

The not guarded part of forests compounds more than 300,0 million ha or about 26 % from the forest area.
According to the forest flammability analysis, over the past 10 years, up to 72% of forest fires are caused by humans, about 7% result from agricultural burnings, 7% originate from lightning and 14% of fires are due to other causes.

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	Years	Additional comments
IUCN Plant Red Data Book			1978	Species status
The Red Book of Russian Federation. Plants, 1988. (in Russian).	M	total coverage	1990	The data have become outdated
UN/FAO document ECE/TIM/SP/18	M	total coverage	2000	Native tree species

List of tree species from Red Book of Russian Federation. Plants (1988):

Status	*Russian name*	*Latin name*
1(E)	Сосна меловая	Pinus sylvestris var. cretacea
1(E)	Береза Максимовича	Betula maximowicziana
1(E)	Клен японский	Acer japonicum
1(E)	Липа Максимовича	Tilia maximowicziana
2(V)	Можжевельник высокий	Juniperus excelsa
2(V)	Лиственница ольгинская	Larix olgensis
2(V)	Сосна пицундская	Pinus brutia subsp. pityusa
2(V)	Сосна густоцветковая	Pinus densiflora
2(V)	Тис ягодный	Taxus baccata
2(V)	Лещина древовидная	Corylus colurna
2(V)	Самшит колхидский	Buxus colchica
2(V)	Хмелеграб обыкновенный	Ostrya carpinifolia
3(R)	Можжевельник Саржента	Juniperus sargentii
3(R)	Тис остроконечный	Taxus cuspidata
3(R)	Береза Радде	Betula raddeana
3(R)	Б. Шмидта	Betula schmidtii
3(R)	Дуб зубчатый	Quercus dentata
3(R)	Падуб Сугероки	Ilex sugerokii
3(R)	Тополь бальзамический	Populus balsamifera

NOTE:
1 (E) – endangered species (sub-species) are hard to preserve if the factors, contributing to the their decrease of population are to continue. Taxons, which population has reduced to critical levels and also which areas of distribution have dramatically reduced, belong to the endangered species category;

2 (V) – sensitive and vulnerable species (subspecies) include taxons that are likely to be moved to the above-mentioned category of endangered species if the factors, contributing to the decrease in their population are to continue. This category also includes taxons which population went down due to their excessive usage, considerable disturbance of habitats and other changes in the environment;

3 (R) – rare species (sub-species). This category includes taxons represented by small populations that are not endangered, vulnerable, sensitive or extinct, but yet, running risks to be in this category. Usually, these taxons are bound to a very limited territory or have a narrow ecological amplitude, or else – are scattered over the vast territories;

9.3 Reclassification into FRA 2005 classes

FRA 2005 Categories	National categories
Number of native tree species	The total number of native tree species that have been identified as the formed forest cover.
Number of critically endangered tree species	The number of native tree species that are classified as (E) – "Endangered" in the IUCN Plant Red Data Book, 1978.
Number of endangered tree species	The number of native tree species that are classified as (V) - "Vulnerable" in the IUCN Plant Red Data Book, 1978.
Number of vulnerable tree species	The number of native tree species that are classified as (R) "Rare" in the IUCN Plant Red Data Book, 1978.

9.4 Data for National reporting table T9

FRA 2005 Category	Number of species year 2000
Native tree species*)	181
Critically endangered tree species	4
Endangered tree species	8
Vulnerable tree species	7

NOTE:
*) – dominant and codominant tree species only (ECE/TIM/SP/18).

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	Years	Additional comments
Forest resources USSR (under the count on 01.01.1998). The statistical collection / Goscomles USSR, M., 1990. (in Russian).	H	partial coverage	1990	Growing Stock composition
Forest resources of Russia (as of 01.01.1998). Vademecum / VNIIClesresurs, M., 1999.(in Russian).	M	partial coverage	2000	Growing Stock composition
Forest resources of Russia (as of 01.01.2003).Vademecum / VNIILM, M., 2003.(in Russian).	M	partial coverage	2005	Growing Stock composition

The database of the State account of forest resources (SAFR) of Russia for 1988 were used for the characteristic of FRA –1990; the SAFR database of 1998 - for FRA-2000; the SAFR database of 2003 - for FRA-2005 without extrapolations.

10.3 Reclassification into FRA 2005 classes

FRA 2005 category / Species name (Scientific name and common name)	Growing Stock in Forests (million cubic meters)		
	FRA-2005	%%	National data in 2003 (without bushes)
Larch (Larix - 4 species)	24950,84	31,00	23107,99
Pine (Pinus – 6 species)	16202,61	20,13	15005,90
Birch (Betula – 10 species)	11549,62	14,35	10696,57
Spruce (Picea – 6 species)	10807,36	13,43	10009,14
Pine siberian stone (Pinus sibirica-1sp.)	8419,63	10,46	7797,76
Aspen (Populus tremula – 1 species)	3331,99	4,14	3085,89
Fir (Abies – 4 species)	2742,84	3,41	2540,26
Oak (Quercus – 5 species)	897,52	1,12	831,23
Lime (Tilia – 6 species)	598,69	0,74	554,47
Beech (Fagus – 2 species)	228,52	0,28	211,64
Remainder of species (36 species)	749,43	0,93	694,08
Total (181 native species)	**80479,05**	100,00	**74534,93**

NOTE:

Growing Stock composition is known for MNR forests only. It was re-counted (on %%) for all Forest FRA2005 area.

10.4 Data for National reporting table T10

FRA 2005 category / Species name (Scientific name and common name)	Growing Stock in Forests (million cubic meters)[1)]		
	1990	**2000**	**2005[2)]**
Larch (Larix)	27245,49	25338,11	24950,84
Pine (Pinus)	15663,76	16289,58	16202,61
Birch (Betula)	11653,77	11022,96	11549,62
Spruce (Picea)	9380,65	10915,47	10807,36
Pine siberian stone (Pinus sibirica)	8212,07	8457,70	8419,63
Aspen (Populus tremula)	2905,44	3237,76	3331,99
Fir (Abies)	2865,42	2682,57	2742,84
Oak (Quercus)	856,42	858,75	897,52
Lime (Tilia)	480,24	570,99	598,69
Beech (Fagus)	192,10	201,26	228,52
Remainder of species	576,29	695,21	749,43
Total	**80039,64**	**80270,39**	**80479,05**

Comments to National reporting table T10:

Data for 2005 is according to State account of forest resources 2003 (SAFR-2003). The next SAFR will be carried out in 2008 only. The data of table T10 were used for accounts of a biomass stock (see Example of biomass calculation for table T6).

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	Years	Additional comments
The departmental (accounting) data of NIPIEIlesprom (data from N.A. Bardin)	M	Total (?) coverage	1988-2003	

11.2.2 Original data

National wood removal data:

Years	Volume in 1000 cubic meters of roundwood over bark	
	Industrial roundwood	Woodfuel
1988	317605	71578
1989	309224	64688
1990	276850	58767
1991	274300	81100
1992	164000	64524
1993	136030	39020
1994	79780	32020
1995	82750	33460
1996	73005	38269
1997	88374	46290
1998	85929	44250
1999	94600	49000
2000	105800	52300
2001	117800	46900
2002	118600	46400
2003	125133	48960
2004 (forecast)	126720	49280
2005 (forecast)	129400	50600

11.3 Reclassification into FRA 2005 classes

FRA 2005 Categories	National categories
Industrial wood removal	The wood removed (volume of roundwood over bark) for production of goods.
Woodfuel removal	The wood removed for energy production (firewood) purposes.

11.4 Data for National reporting table T11

FRA 2005 Category	Volume in 1000 cubic meters of roundwood over bark					
	Forest			Other wooded land		
	1990[1)]	2000[1)]	2005[2)]	1990	2000	2005
Industrial roundwood[3)]	268395,8	104545,8	129400,0	NDA	NDA	NDA
Woodfuel[3)]	68131,4	47770,0	50600,0	NDA	NDA	NDA
TOTAL	336527,2	152315,8	180000,0	NDA	NDA	NDA

NOTES:
1) The year 1990 and 2000 in this table represent five-year averages to take care of annual fluctuations.
2) The forecast assessment.
3) Data for Russian Federation given in Appendix 3-Table 3-1 (Working paper 82, Rome 2004) do not correspond to the validity. The causes of apostates of the data are not known.

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
The departmental (accounting) data of NIPIEIlesprom (data from N.A. Bardin)	M	Total coverage	2000	value of wood removal

12.3 Data for National reporting table T12

FRA 2005 Categories	Value of roundwood removal (1000 USD)					
	Forest			Other wooded land		
	1990	2000[1)]	2005[2)]	1990	2000	2005
Industrial roundwood	NDA	1463641	1811600	NDA	NDA	NDA
Woodfuel	NDA	157641	166980	NDA	NDA	NDA
TOTAL for Country	NDA	1621282	1978580	NDA	NDA	NDA

NOTES:
1) The year 2000 in this table represent five-year averages to take care of annual fluctuations.
2) The forecast assessment.

12.4 Comments to National reporting table T12

The average prices of wood are taken for a domestic market in 2000 yr:

industrial roundwood = 14,0 $ US per 1 m3;
woodfuel = 3,3 $ US per 1 m3.

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**
The departmental (accounting) data of MNR	L	partial coverage	1990 - 2000	MNR system only
UN/FAO document ECE/TIM/SP/18	L	partial coverage	2000	Animal products

According to experts, the estimated annual commercial yield of berries (cranberry, cowberry, blueberry) makes up 4 mill. tons and mushrooms make up about 2.1 mill. tons. The stocks of medicinal plants (Panax quinquefolium, Eleutherococcus senticosus, Rhodiola rosen, Schizandra chinensis, etc.) are of great demand both at the domestic and international markets and are extensively growing in the forests. The economic value of non-timber forest products and services offered by forests, growing at permafrost soils, is higher than the growing timber value. Strengthening and developing recreational values, tourism, hunting and nature protection is in many cases more profitable than wood harvesting.

13.3 Data for National reporting table T13

FRA 2005 Categories	Scale factor	Unit	NWFP removal[1)]		
			1990[2)]	2000[2)]	2005[3)]
Plant products / raw material					
1. Food (berry, hazel-nut)		ton	12731	599	800
2. Fodder			NDA	NDA	NDA
3. Raw material for medicine and aromatic products		ton	2341	479	700
4. Raw material for colorants and dyes			NDA	NDA	NDA
5. Raw material for utensils, handicrafts & construction			NDA	NDA	NDA
6. Ornamental plants			NDA	NDA	NDA
7. Exudates (birch sap)		ton	20,2	0,39	0,40
8. Other plant products (mushrooms)		ton	2341	156	500
Animal products / raw material					
9. Living animals			NDA	NDA	NDA
10. Hides, skins and trophies[4)]		1000 n	NDA	20000	NDA
11. Wild honey and bee-wax		ton	51,3	20	30
12. Bush meat[4)]		ton	NDA	9000	NDA
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

NOTES:
1) The data for MNR system only.
2) The year 1990 and 2000 in this table represent five-year averages to take care of annual fluctuations.
3) The forecast assessments.
4) Expert assessments.

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**
The departmental (accounting) data of MNR	L	partial coverage	1990 - 2000	MNR system only

14.3 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 (berry, hazel-nut)	25462	1198	1600
2. Fodder	NDA	NDA	NDA
3. Raw material for medicine and aromatic products	7023	1437	2100
4. Raw material for colorants and dyes	NDA	NDA	NDA
5. Raw material for utensils, handicrafts & construction	NDA	NDA	NDA
6. Ornamental plants	NDA	NDA	NDA
7. Exudates (birch sap)	10,1	0,2	0,2
8. Other plant products (mushrooms)	4682	312	1000
Animal products / raw material			
9. Living animals	NDA	NDA	NDA
10. Hides, skins and trophies	NDA	NDA	NDA
11. Wild honey and bee-wax	205	80	120
12. Bush meat	NDA	NDA	NDA
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	**37382,1**	**3027,2**	**4820,2**

14.4 Comments to National reporting table T14:

1. The data for MNR system only.
2. The average prices of non-wood forest products are taken for a domestic market in 2000:
-Food (berry, hazel-nut) = 2 $ US per 1 kg;
-Raw material for medicine and aromatic products = 3 $ US per 1 kg (dry weight);
-Other plant products (mushrooms) = 2 $ US per 1 kg;
-Exudates (birch sap) = 0,5 $ US per 1 L;
-Wild honey and bee-wax = 4 $ per 1 kg.

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
The departmental (accounting) data of MNR RF	M	partial coverage	2000	Forestry only

15.3 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990[1)]	2000[1)]
Primary production of goods[2)]	149,8	154,9
Provision of services[2)]	37,3	41,5
Unspecified forestry activities	NDA	NDA
TOTAL	187,1	196,4

NOTES:
1) The year 1990 and 2000 in this table represent five-year averages to take care of annual fluctuations.
2) The workers and employees of MNR system (forestry only).

16 Thematic reporting tables

Net annual increment (NAI) and Net ecosystem production (NEP) of Carbon in Russian forests

16.1 National data

16.1.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Forest resources USSR (under the count on 01.01.1998). The statistical collection / Goscomles USSR, M., 1990. (in Russian).	H	partial coverage	1990	Net annual increment
Forest resources of Russia (as of 01.01.1998). Vademecum / VNIIClesresurs, M., 1999.(in Russian).	M	partial coverage	2000	Net annual increment
Forest resources of Russia (as of 01.01.2003). Vademecum / VNIILM, M., 2003. (in Russian).	M	partial coverage	2005	Net annual increment
Zagreev V.V. et al. All-union specifications for taxation of forests / M., Kolos, 1992. .(in Russian).	H	partial coverage	1990-2005	tree fall
B.N. Moiseev & A.N. Filipchuk. Carbon balance for Russian forests // Use and protection of natural resources of Russia, № 4-5, 2003 (in Russian).	M	total coverage	1990-2005	NEP of carbon

NOTE: J. Liski and P. Kauppi methodical approach TBFRA-2000 is used at calculations Net ecosystem production (NEP) of Carbon in Russian forests (ECE/TIM/SP/17).

Data for National reporting Table 16:

Attribute	Units	1990 yr	2000 yr	2005 yr
Net annual increment (NAI)	Mill. m^3/yr	938,0	970,4	993,8
Natural losses (tree fall)[1)]	Mill. m^3/yr	640,0	662,1	678,0
Gross annual increment (GAI)	Mill. m^3/yr	1578,0	1632,5	1671,9
GAI of biomass[2)]	Mill. t/yr	725,9	750,9	769,1
Expansion factor (stamps, roots, branches)[3)]	t/m3	1,5	1,5	1,5
Net ecosystem production (NEP)	Mill. t /yr	1088,8	1126,4	1153,6
Carbon NEP of stocked forest lands	Mill. t C/yr	544,4	563,2	576,8
Carbon NEP of unstocked forest lands[4)]	Mill. t C/yr	37,9	36,2	30,0
Carbon NEP TOTAL	**Mill. t C/yr**	**582,3**	**599,4**	**606,8**

NOTES:

1) expert assessment under the Standard tables for tree stands dynamics.
2) basic density ≈ 0,46 t/m^3.
3) expansion factor for roots ≈ 1,25; expansion factor for stamps and branches ≈ 1,2.
4) expert assessment.