Forestry Department
Food and Agriculture Organization of the United Nations

GLOBAL FOREST RESOURCES ASSESSMENT

COUNTRY REPORTS

SLOVAKIA

FRA2005/086
Rome, 2005

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:

LONGAUER, Roman,
MORAVČÍK, Martin,

Forest Research Institute,
T.G. Masaryka 22
960 92 Zvolen, Slovakia
Tel.+421-45-5 314 327
Fax +421-45-5 314 192
E-mail: roman.longauer@fris.sk,
martin.moravcik@fris.sk
URL: http://www.fris.sk

Other professionals involved in the reporting process:

ĎURKOVIČ, Július,
LONGAUEROVÁ, Valéria.
MECKO, Julián,
MINĎÁŠ, Jozef,
PAVLENDA, Pavel,
PETRÁŠ, Rudolf,
SVITOK, Roman,
VLADOVIČ, Jozef,
TUTKA, Jozef,

Contents

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
1) Forest Information Centre (LIC) Lesoprojekt	H	Forest	1990 2000 2003	Databases of national forest inventory
2) Statistical Yearbook of the Slovak Republic 1991, 2001	H	Other land, Inland Water Bodies	1990 2000	

1.2.2 Classification and definitions

National category	Definition
FOREST STANDS	▪ Forest lands covered by forest tree species that serve the fulfilment of forest functions; ▪ Forest lands where forest stands were removed temporarily and shall be regenerated (clearings after felling); ▪ Areas of skidding roads and dividing lines on forest lands up to 4 m wide; ▪ Lands intended for reforestation that were declared as a forest land by the state forest authority and are determined by the authority´s decision for afforestation; ▪ Temporary forest depots and Christmas tree plantations on forest lands that will be converted into forest stands within 10 years; ▪ Areas of industrial plantations on forest lands.
Forest land resource	According to the Article 2 of the Act no. 61/1977 of Coll. on forests, as promulgated by later regulations, the Forest Land Resources comprise: ▪ Forest stands – forest land covered by forest tree species or temporarily without them that fulfil forest functions (forest stands in the above); ▪ Unstocked land – forest land without forest stands that serves the forestry: o Dividing lines and forest roads wider than 4 m, o Permanent log yards, o Forest nurseries, o Forest seed orchards,

	o Lands with specific purposes (small fields and meadows for game, areas under electric lines, dividing lines; areas for recreation: look out places, places for camping, restsites with shelters and fireplaces, shooting lines, skyline lifts and ski tows, downhill runs etc.); o Lands above timberline (forest stands) in high mountain areas except of built-up lands and roads leading to them.
Other land	Agricultural lands, residential areas, other built-up lands, barren areas.
Other land with tree cover	Lands belonging to the agricultural land resource covered by forest tree species (so called "white plots"). The minimum area of each such plot is approx. 0.3 ha and stocking 0.6. Height, age and canopy are not defined. These plots are not considered forest stands and are not covered by the forest inventory and forest management planning. When forest management plans are elaborated, some of them are plotted into the forest stand maps and their area is registered. After an agreement of all interested parties, the state forest authority can declare them "forest lands" providing that their changed landuse type is registered in the land registry.

1.2.3 Original data

		Area (1000 ha)		
		1990 LIC Lesoprojekt	**2000 LIC Lesoprojekt**	**2003 LIC Lesoprojekt**
Forest	Forest land resources	1977[1)]	1998[1)]	2004[1)]
	White plots	26[1)]	30[1)]	32[1)]
Other wooded land				
Other land		2807[2)]	2780[2)]	2772[2)]
...of which land with tree cover				
Inland water bodies		93 [2,3)]	93 [3)]	93 [3)]
Together		4903 [2)]	4901 [3)]	4901 [3)]

[1), 2)] refer to the sources of information listed in Table 1.2.1

[3)] FAOSTAT - Annex 2 of the Guidelines for Country Reporting to FRA 2005, www.fao.org/forestry/site/fra

As regards the reference year 1990, we retained the country area of 4903 ths. ha with reference to the official Statistical Year-books of the Slovak Republic 1990-1994. This area was reduced by 2 ths. ha when Czechoslovakia was split into the Czech Republic and Slovakia on January 1, 1994.

Due to legally binding definition, the national forest inventory is carried out only on lands that are kept in the land registry under the title "Forest Lands". For this reason, the area of "Other wooded land" as well as the majority of "Other lands with tree cover" on Agricultural Lands is not available (NDA). In 2004, the methodology of the National Forest Inventory of Slovakia (2005-2006) that will be carried out as a large-scale inventory based on sample plots was approved. It will allow determination of the area as well as stand characteristics of all forest tree vegetation irrespectively of the landuse category.

National class	**hectares**		
	1990	**2000**	**2003**
Forest land resources	1 976 538	1 997 961	2 004 226
Of that: Forest stands = Forest	**1 921 705**	**1 921 414**	**1 929 310**
Of that: Non-wooded lands*	54 833	76 547	74 916
Other lands with tree cover	26 000	30 000	32 000

* The area of „Non-wooded lands" on forest lands which is a part of „Forest land resources" was placed to category „Other land" because there are not any tree cover on them.

1.3 Analysis and processing of national data

1.3.1 Calibration

Not needed.

1.3.2 Estimation and forecasting

Estimation was not necessary for "forest", "other land" and "inland water bodies". Forecasting for the year 2005 for "forest" was done by taking up the data of 2003 due to practical end of forest area increasing trend since 1990. Data for the National Reporting Table were taken over from the following table:

1.4 Reclassification into FRA 2005 classes

Forest = Forest Stands
Other land with tree cover = "White Plots"

1.5 Data for National reporting table T1

FRA 2005 Categories	Area (1000 hectares)		
	1990	2000	2005
Forest	1922	1921	1929
Other wooded land	NDA	NDA	NDA
Other land	2888	2887	2879
...of which with tree cover [1)]	26[1)]	30[1)]	32[1)]
Inland water bodies	93	93	93
TOTAL	**4903[2)]**	**4901[3)]**	**4901[3)]**

1) Other land with tree cover refers to the registered "white plots". These represent only a minor part of lands with forest trees matching the definitions of OWL and OL with tree cover, however.

2) Statistical Yearbook of the Slovak Republic (Štatistická ročenka Slovenskej republiky) 1991

3) FAOSTAT - Annex 2 of the Guidelines for Country Reporting to FRA 2005, www.fao.org/forestry/site/fra

1.6 Comments to National reporting table T1

Since the first forest inventory in the years 1954-58, the area of both "Forest Land Resources" and "Forest Stands" have increased as a result of: 1) active afforestation of lands not suitable for agriculture, 2) restoration of the timberline and subalpine forests, 3) increase of the area of abandoned agricultural lands naturally colonized by forest trees.

Between 1950 and 1995, the area of "Forest Land Resource" as well as of "Forest Stands" increased approximately linearly. Since 1990, this trend has been slowed down due to a low interest in re-categorization agricultural lands colonized by forest into the land use category of Forest Land, as well as reduced afforestation. The area of Other Wooded Land as well as Other Land with Tree Cover on abandoned farmlands, although obviously increasing, is not a subject of any inventory and reliable statistical data are thus not available (NDA) for it.

Due to legally binding definition, the national forest inventory is carried out only on lands that are kept in the land registry under the title "Forest Lands". For this reason, the area of "Other wooded land" as well as the majority of "Other lands with tree cover" on Agricultural Lands is not available (NDA). In 2004, the methodology of the National Forest Inventory of Slovakia (2005-2006) that will be carried out as a large-scale inventory based on sample plots was approved. It will allow determination of the area as well as stand characteristics of all forest tree vegetation irrespectively of the landuse category.

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
Lesoprojekt Zvolen – Forest Information Centre	H	Forest Stand Area	1990 2000	Databases of the national forest inventory (Permanent Forest Inventory)

2.2.2 Classification and definitions

National class	Definition
National classes and definitions compliant with the FRA-2005	

2.2.3 Original data

Reported detailed structure of forests (forest stands) by their ownership and tenure:

Subjects	Stand land area (ha)			Proportion in 2003 (%)
	By December 31, 1990	By December 31, 2000	By December 31, 2003	
		ownership	ownership	ownership
State	1 912 905	821 125	814 576	42.2
Municipal		185 030	186 519	9.7
= Public ownership	***1 922 ths ha***	***1 006 ths ha***	***1 001 ths ha***	
Private		287 199	231 259	12.0
Shared ownership		476 158	469 130	24.3
Church		63 634	61 430	3.2
Agricultural cooperatives	8 800*	2 770	2 379	0.1
= Private ownership	***0***	***830 ths. ha***	***928 ths ha***	
Unknown/not claimed		85 498	164 017	8.5
= Other ownership		***85 ths. ha***	***164 ths ha***	
Together	***1 921 705***	***1 921 414***	***1 929 310***	***100***

Source: Summary information of the Forest Information Centre 2003

* *Till 1991, the management of forests of Agricultural Cooperatives were under the supervision of the state forest enterprises.*

2.3 Analysis and processing of national data

2.3.1 Calibration
Not needed.

2.3.2 Estimation and forecasting
Not needed.

2.4 Reclassification into FRA 2005 classes

The category **„private ownership“** includes the ownership categories „private“, „shared ownership“, „church“ and „private co-operatives“.

The category **„public ownership“** includes the ownership categories: „state“ and „municipal“.

The category **“other ownership”** includes the ownership category “unknown”.

2.5 Data for National reporting table T2

FRA 2005 Categories	Area (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Private ownership	0*	830	NDA	NDA
Public ownership	1922	1006	NDA	NDA
Other ownership	0	85	NDA	NDA
TOTAL	1922	1921	NDA	NDA

***** Before the year 1991, when the acts on restitutions entered into force, all forests were held and managed by the state organizations and agricultural co-operatives.

2.6 Comments to National reporting table T2

Before the year 1991, when the acts on restitutions entered into force, all forests were held and managed by the state organizations and agricultural co-operatives.

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
Lesoprojekt Zvolen – Forest Information Centre	M	Forest stand area	1990 2000 2003	Databases of the national forest inventory (Summary information of LIC Lesoprojekt Zvolen)
Ministry of the Environment of the SR	M	Forest stand area	2000 2003	Report on the Environment of the Slovak Republic (Green Report)

3.2.2 Classification and definitions

National class – Functional types	Definition
Production	Includes wood production and other productive functions.
Erosion-control	If a forest protects soil against destruction by surface water runoff causing area or rill erosion.
Water-management	If a forest improves runoff conditions either „qualitatively“ by balancing fluctuating water courses or „quantitatively“ by increasing the amount of water in water courses.
Avalanche-control	If a forest serves to prevent avalanches.
Bank-protection	If a forest protects banks of water courses and water bodies against water erosion and/or protects the water quality.
Deflation-control	If a forest protects soil against wind erosion preventing its „drifting away“or capturing the soil particles drifted from open areas.
Water-protection	If a forest is situated in a protection zone of water resources, spa springs or

	springs of mineral table waters.
Recreational	If a forest serves primarily recreation. Forest stands are maintained species rich and esthetically forceful to meet the needs and interests of visitors.
Spa-therapeutic	If a forest is used for therapeutical purposes in the surroundings of spas and medical facilities. Their management aims at the creation of hygienically favourable and esthetically forceful nature environment meeting the needs of persons under medical care or receiving spa treatment.
Nature-protection	If a forest is utilised for conservation of its natural values as regards its origin, beauty and biological diversity.
Pollution-control	If a forest buffers negative impacts of industrial pollution on humans and nature; it is applied either if the life expectancy of forest vegetation is apparently reduced due to the pollution, or for the improvement of air quality and physical environment;.
Game-management	If a forest is intended primarily for breeding and protection of game. The management objective is to provide an appropriate forest habitat for the game.
Educational-research	If a forest serves primarily to the educational, scientific and research purposes.

3.2.3 Original data

FRA 2005 CATEGORY / ASSOCIATED FUNCTIONS	Area (1000 ha)					
	Main functions			Total area with given function		
	1990	2000	2005	1990	2000	2005
Production	655	280	184			
Protection of soil and water	245	327	343			
Conservation of biodiversity	80*	51* (94)**	56* (96)**			
Social services	182	265	244			
Multiple purpose	760	998	1 102			
No or unknown functions	0	0	0			
Together – Forest	**1 922**	**1 921**	**1 929**			

* Area according to the functional types, Forest Information Centre of Lesoprojekt Zvolen
** Area of forests under the 4th and 5th degree of nature protection, Ministry of the Environment

The original data are already reclassified according to the Reclassification described in 3.4.

The area of forest stands for biodiversity conservation refers to the data of the Ministry of the Environment for forests in the 4th and 5th degree of nature protection (DNC). There was a difference in the area of this functional category between the Forestry Information Centre and Ministry of Environment, which was subtracted from the area of "Multiple purpose forests".

Derivation of the area of forests for „Conservation of biodiversity":
2003 = 2005: Status as of 31 December 2003 according to the Ministry of the Environment (Green Report 2003)
4th DNC: 13 334 x 0.89 (forest coverage of protected territories) = 11 867 ha
5th DNC: 98 402 x 0.86 (forest coverage) = 84 626 ha

Together (4th+5th) = 96 493 ha

2000: Source Ministry of the Environment of SR, Green Report 2002:
4th DNC: 6 872 (Protected Range) + 3 861 (Protection Zone of the 5th protection degree) = 10 733 x 0.89 (forest coverage) = 9 552 ha
5th DNC: 98 752 x 0.86 = 84 927

Together (4th+5th) = 94 479 ha.

3.3 Analysis and processing of national data

3.3.1 Calibration

Not needed.

3.3.2 Estimation and forecasting

The state as of 31 December 2003 has been used as a forecast for 2005 since no significant changes are expected in functional typisation till 2005.

3.4 Reclassification into FRA 2005 classes

Classification of forests according to their functions was done according to their primary function.

Production = Area of forest stands intended solely for the production function.

Protection of soil and water = Area of forest stands which main function is „erosion-control", „water-management", „avalanche-control", „bank-protection", „deflation-control", „water-protection".

Conservation of biodiversity = Area of forest stands under the most strict 4th and 5th degree of nature conservation according to the Act on nature and landscape protection.

Social services = Area of forest stands which main function is „recreational", „spa-therapeutic", „pollution-control", „game-management", "educational-research".

Multiple purpose = Area of forest stands which main function is production but have also another associated function(s).

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	655	280	184	NDA	NDA	NDA
Protection of soil and water	245	327	343	NDA	NDA	NDA
Conservation of biodiversity	80	94	96	NDA	NDA	NDA
Social services	182	265	244	NDA	NDA	NDA
Multiple purpose	760	955	1062			
No or unknown function	0	0	0			
Total – Forest	**1922**	**1921**	**1929**			
Other wooded land						
Production	NDA	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	NDA	NDA	NDA	NDA	NDA	NDA
Multiple purpose	NDA	NDA	NDA			
No or unknown function	NDA	NDA	NDA			
Total – Other wooded land	NDA	NDA	NDA			

3.6 Comments to National reporting table T3

Table T3 summarises data about the functional forest types from the Forestry Information Centre of Lesoprojekt Zvolen. Reclassification of the national data into FRA 2005 classes is described in 3.4.

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
Lesoprojekt* Zvolen – Forest Information Centre	H	Forest stands	1990	Databases contaning forest inventory data 1978-1991
Lesoprojekt Zvolen – Forest Information Centre	H		2000	Databases containing forest inventory data 1991-2000
Lesoprojekt Zvolen – Forest Information Centre	H		2005	Databases containing forest inventory data 1995-2004
KORPEĽ, Š.: Primeval Forests of Slovakia, Príroda, Bratislava,	H	Forest stands	1989	Results of a long term research of natural forests

* Lesoprojekt is the Institute for Forest Inventory and Management Planning

4.2.2 Classification and definitions

National class	Definition
National classes and definitions are compliant with the FRA-2005	

4.2.3 Original data

Presented in the national reporting table.

4.3 Analysis and processing of national data

4.3.1 Calibration

Not needed.

4.3.2 Estimation and forecasting

The databases containing compartment-wise data originating in the forest inventory carried out between 1995 and 2004 were taken as a basis for detailed assessments.

Because the primary database for forest compartment does not contain direct indicators of the naturalness of forest stands, the classification algorithm was developed for evaluation of the typological suitability of current tree species composition (degree of naturalness of tree species composition), age of stands, stands structure (storeys, layers), forest categories and subcategories, level (degree) of nature protection and a type of protected territory (if applicable), forest form, stand establishment, management status and regeneration system, forest stand types, basic and applied typological units. Subsequently, software that enables classification of basic input data for forest compartments was developed in collaboration of the Forest Research Institute and Forestry Information Centre of Lesoprojekt. This software is stored at the Computer Centre of Lesoprojekt. Data sets for 3 reference periods were analysed:

- Databases with the inventory data for the forest management plans valid 1978-1991,
- Databases with the inventory data for the forest management plans valid 1991-2000,
- Databases with the inventory data for the forest management plans valid 1995-2004.

These databases contain all data collected in forest compartments except of the forests owned by the Ministry of Defence.

Plantations: The category includes the stands of Euroamerican poplars and exotic tree species composed of no more than 2 species, which are intensively managed and are regular arrangement (spacing). From the area of locust, only locust forests in the category of commercial forests were calculated. The total stand area of plantations was classified further by the forest categories into productive plantations occurring in the category of commercial forests and protective plantations occurring in the category of protection forests and special purpose forests.

Primary (primeval) forests: Their area was determined on the basis of the following database indicators: long-term non-intervention status, diverse age and stand structures, and the class of naturalness as a synthetic descriptor of the compliance of current tree species composition with the model and potential natural vegetation according to the typological units (Natura 2000). Two highest classes of naturallnes (1 and 2), i.e. natural or only slightly deviating tree species composition, were considered. Of the compartments fulfilling the aforementioned conditions, only those belonging to the category of protective and special purpose forests with the priority of nature conservation function, were accepted. The final area was compared with data published in the book "Primeval Forests of Slovakia" of KORPEĽ, 1989, which summarized the results of a long term research into the natural forests of Slovakia.

Modified natural forest: The area includes forests originating in natural regeneration, taking into the account their management condition and applied regeneration system. This category excludes stands in the 4th (low) naturalness class, consisting predominantly of non-native tree species which presence does not match with fit the forest site type nor potential natural forest vegetation. It includes forest stands covered by the nature protection degree 3 and higher, if they meet the above mentioned criteria.

Semi-natural forest: The area includes forest stands originating in artificial and combined regeneration, taking their management condition and regeneration system into the account. It includes forest stands with the mean (3^{rd}) and low (4^{th}) degree of naturalness, i.e. with partly to fully modified tree species composition. It also includes stands of naturally regenerating introduced tree species which do not meet definition of plantation, e.g. soil protecting stands of black locust (*Robinia pseudoacacia*) with a low management intensity.

The latest updates to the databases of the National Forest Inventory referring to January 1, 2005, and detailed data concerning the forest management plans elaborated from 1995 to 2004 provided a basis for the forecast to 2005.

4.4 Reclassification into FRA 2005 classes

Not needed.

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	24	24	24	NDA	NDA	NDA
Modified natural	938	939	946	NDA	NDA	NDA
Semi-natural	937	938	940	NDA	NDA	NDA
Productive plantation	21	18	17	NDA	NDA	NDA
Protective plantation	2	2	2	NDA	NDA	NDA
TOTAL	**1 922**	**1 921**	**1 929**	NDA	NDA	NDA

4.6 Comments to National reporting table T4

The latest available estimate of Primeval forest is used for all reporting years. Earlier estimates are available but since the latest figures are a result of improved reliability and accuracy of more recent forest survey/inventory data (retrieval research), no change is reported.

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
Summary Forest Management Plan 1988; Forestry Information Centre of Lesoprojekt Zvolen*	H	Growing stock of wood with dbh > 7 cm under bark, tree species, age classes, yield classes	1988	National Forest Inventory
Summary information of Forestry Information Centre; Permanent Forest Inventory 2000, 2003; Lesoprojekt Zvolen	H	Growing stock of wood with dbh > 7 cm under bark, tree species, age classes, yield classes	2000 2003	Some complementary data were obtained also directly from the Forest Information Centre of Lesoprojekt Zvolen

* Lesoprojekt is the Institute for Forest Inventory and Management Planning

[1]), [2]) Growing stock of wood with dbh > 7 cm under bark in the Summary Forest Management Plan and Permanent Forest Inventory is available by age classes for 6 coniferous and 15 broadleaved tree species or species groups.

5.2.2 Classification and definitions

National class	Definition
Growing stock	Volume under bark of all living trees more than 7 cm in diameter at breast height. Includes the stem from ground level up to the top diameter of 7 cm.
Commercial growing stock (CGS)	According to the National Indicators of Sustainable Forest Management, the CGS as the growing stock of forests without the category of protection forests of letter a) forests on extraordinarily unfavourable sites and letter c) forests in the zone of mountain pine (timberline) and forest stands in the 5th (non-intervention) degree of protection according to the Act on nature and landscape protection.

5.2.3 Original data

FRA 2005 category	Volume (million m^3)					
	Forest			Other wooded land		
	1988	2000	2003	1988	2000	2003
Growing stock under bark (national definition)	341.9	410.0	428.3	NDA	NDA	NDA
Growing stock over bark	389.3	463.2	481.9	NDA	NDA	NDA
Commercial growing stock under bark (national)	306.1	386.4	377.9	NDA	NDA	NDA
CGS over bark	348.5	436.9	425.9	NDA	NDA	NDA

The original data on growing stock based on national definitions, in accordance with the law, refer to the volume of wood with DBH over 7 cm under bark. They had to be converted into the volume over bark. The conversion Coefficients for Bark were derived from the "Rastové tabuľky hlavných drevín" [Yield Tables of Main Tree Species] (HALAJ, J. – PETRÁŠ, R. 1998) and "Rastové tabuľky topoľových klonov" [Yield Tables of Poplar Clones] (MECKO, J. ET AL. 1997) for this purpose. The mean values of the Coefficients of Bark were derived for each age class according to the mean site indexes of all 21 tree species or tree species groups listed in the summaries of the national forest inventory.

Conversion of "commercial growing stock under bark" into "growing stock over bark" followed national definition of the CGS given in 5.2.2.

5.3 Analysis and processing of national data

5.3.1 Calibration

Not needed

5.3.2 Estimation and forecasting

FRA 2005 Categories	Forest (volume in million m^3 over bark)					
	Original data			Converted for FRA		
	1988	2000	2003	1990	2000	2005
Growing stock	389.3	463.2	481.9	401.6	463.2	494.4
Commercial growing stock	348.5	436.9	425.9	363.2	436.9	418.6

Data for 1990 were determined by means of linear interpolation of data for 1988 and 2000.
The forecast for 2005 is a linear extrapolation of data for 1988, 2000 and 2003.

5.4 Reclassification into FRA 2005 classes

Was not needed.

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	401.6	463.2	494.4	NDA	NDA	NDA
Commercial growing stock	363.2	436.9	418.6	NDA	NDA	NDA

Specification of country threshold values	Unit	Value	Complementary information
1. Minimum diameter at breast height of trees included in the Growing Stock (X)	cm	7	Diameter over bark.
2. Minimum diameter at the top end of a stem (Y) for calculation of the Growing Stock	cm	7	Diameter over bark
3. Minimum diameter of branches included in the Growing Stock (W)	cm	7	Diameter over bark

4. Minimum diameter at breast height of trees in Commercial Growing Stock (Z)	cm	7	Diameter over bark
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

The presented data on growing stock show a high accuracy since they result from a regular yearly updating of the growing stock on approximately 1/10 of the forest stand area. The stand-wise forest inventory is based on the statistical survey of the growing stock in young and medium-age stands and full measurement of mature stands.

The growing stock shows a long-term increasing trend, which is associated mainly with
- uneven age structure and over-proportional representation of medium-age stands (50 to 90-years-old)
- use of more precise domestic yield tables for the main tree species since 1993,
- assumed positive effects of high nitrogen deposition originating in air pollution and of the climate change.

Presented data refer to the minimum measured diameters (DBH, top end of a stem, branches) of 7 cm.

The national figures published in the UN/ECE-FAO TBFRA-2000 for the reference year 1996 (510 mill. m^3 o.b.) and MCPFE report 2003 (554 mill. m^3 o.b.) included all standing volume starting from the threshold of 0 cm, despite of the note published there that the minimum diameter was 7 cm.

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
Summary Forest Management Plan 1988, The Forestry Information Centre of Lesoprojekt Zvolen*	H	Growing stock of wood with dbh > 7 cm under bark, tree species, age classes, yield classes	1988	National Forest Inventory
Permanent Forest Inventory 2000 and 2003. Summary data sets of the Forestry Information Centre of Lesoprojekt Zvolen	H	Growing stock of wood with dbh > 7 cm under bark, tree species, age classes, yield classes	2000 2003	Some complementary data were obtained also directly from the Forest Information Centre of Lesoprojekt Zvolen
MINĎÁŠ, J. ET AL. 1997: Carbon stock and balance in the forests of Slovakia[1)]	M	Stock of biomass and carbon	1996	For quantification of carbon stock and its change in respective years in forest ecosystems of Slovakia.

* Lesoprojekt is the Institute for Forest Inventory and Management Planning

1) Used solely as a methodological reference for calculation of the biomass stock.

6.2.2 Classification and definitions

National class	Definition
Above-ground biomass[2)]	National definition complies with requirements of FRA 2005 definition
Below-ground biomass[2)]	National definition complies with requirements of FRA 2005 definition
Dead wood biomass	National definition of this FRA category does not exist [3)]

2) Calculation of the "above-ground biomass is based on the data on growing stock listed in Table 5, according to the procedure given in section 5.2.3.

3) Available data and information from Lesoprojekt Zvolen have not allowed direct determination of the dead wood biomass in accordance with the FRA 2005. The figures concerning the deadwood biomass are an expert estimates based on the professional knowledge of the relevant staff of the Forest Research Institute Zvolen and Lesoprojekt Zvolen.

6.2.3 Original data

FRA 2005 Category	Biomass (million metric tonnes oven-dry weight)					
	Forest			Other wooded land		
	1988	2000	2003	1988	2000	2003
Above-ground biomass[4), 5), 7)]	261.4	315.3	326.6	NDA	NDA	NDA
Below-ground biomass[6)]	56.1	68.1	70.8	NDA	NDA	NDA
Dead wood biomass[8)]	24.5	29.4	30.7	NDA	NDA	NDA
TOTAL	**342.0**	**412.8**	**428.1**	NDA	NDA	NDA

[4)] Above-ground biomass was determined as a sum of biomass of tree species and the biomass of foliage. Original data of growing stock of wood with dbh > 7 cm under bark for Table 5 were re-calculated to growing stock of wood over bark using the Coefficients of Wood with dbh < 7 cm, derived from "Rastové tabuľky hlavných drevín" [Yield Tables of Main Tree Species] (HALAJ, J. – PETRÁŠ, R. 1998) and "Rastové tabuľky topoľových klonov" [Yield Tables of Poplar Clones] (MECKO, J. ET AL. 1997). The mean values of the Coefficients of Wood with dbh < 7 were derived according to the age classes for the mean site indexes of all 21 tree species or tree species groups listed in the summaries of the national forest inventory.
[5)] Oven-dry weight of the biomass was a product of the growing stock of individual tree species and their wood density in an oven-dry weight. The values of wood density of the tree species were adopted from POŽGAJ, A. ET AL. 1993: Structure and properties of wood.
[6)] The assessment of the below-ground biomass follows the available results of scientific studies. It is an expert estimate based on the following proportions in the above-ground biomass: coniferous tree species 20%, broadleaved tree species 25%.
[7)] The assessment of the biomass of foliage, thin twigs and seeds follows the available results of scientific studies. It is an expert estimate based on the domestic yield tables for coniferous and broadleaved tree species and the following proportions in the above-ground and below-ground biomass: coniferous tree species 15%, broadleaved tree species 2%.

6.3 Analysis and processing of national data

6.3.1 Calibration

Not needed.

6.3.2 Estimation and forecasting

FRA 2005 Category	Biomass (million metric tonnes oven-dry weight)					
	Original data			Re-calculated for FRA		
	1988	2000	2003	1990	2000	2005
Above-ground biomass	261.4	315.3	326.6	270.4	315.3	334.1
Below-ground biomass	56.1	68.1	70.8	58.1	68.1	72.6
Dead wood biomass	24.5	29.4	30.7	25.3	29.4	31.6
TOTAL	**342.0**	**412.8**	**428.1**	**353.8**	**412.8**	**438.3**

- Data for 1990 were determined by linear interpolation of data of the years 1988 and 2000.
- Prospective forecasting for the year 2005 is a linear extrapolation of data for 2000 and 2003.

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	270.4	315.3	334.1	NDA	NDA	NDA
Below-ground biomass	58.1	68.1	72.6	NDA	NDA	NDA
Dead wood biomass	25.3	29.4	31.6	NDA	NDA	NDA
TOTAL	**353,8**	**412,8**	**438,3**	NDA	NDA	NDA

Additional data and thresholds for Table 5, category Forest:

Forest	Unit	Notes
Considered minimal average at breast height of standing trees for determination of dead wood biomass	cm	10
Considered minimal average at smaller end of tree residuals left on the ground for determination of wood biomass	cm	10
Minimal average at breast height of standing living trees for determination of wood biomass	cm	0
Minimal average of branches for biomass determination	cm	0
Considered minimal average of branches for determination of dead wood biomass	cm	10
Minimal average of roots for biomass determination	mm	2
Considered minimal average of roots for determination of dead wood biomass	cm	10
Is stump included into above-ground or below-ground biomass?	Above-ground /Below-ground	Below-ground
Does bark comprise biomass?	Yes/No	Yes
Have the thresholds of above-ground biomass changed since 1990?	Yes/No	No

6.6 Comments to National reporting table T6

The increasing biomass stock reflects the continuous increase of the growing stock.

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
Summary Forest Management Plan 1988, The Forestry Information Centre of Lesoprojekt Zvolen*	H	Growing stock of wood with dbh > 7 cm under bark, tree species, age classes, yield classes	1988	National Forest Inventory
Permanent Forest Inventory 2000 and 2003. Summary data sets of the Forestry Information Centre of Lesoprojekt Zvolen	H	Growing stock of wood with dbh > 7 cm under bark, tree species, age classes, yield classes	2000 2003	Some complementary data were obtained also directly from the Forest Information Centre of Lesoprojekt Zvolen
FAO-UN ECE TBRFA 2000	M	Growing stock of wood and biomass	1996	Data of Forestry Research Institute Zvolen
Minďáš, J. et al. 1997: Carbon stock and balance in the forests of Slovakia[1)]	M	Stock of biomass and carbon	1996	For quantification of carbon stock and its change in respective years in forest ecosystems of Slovakia.
ICP Forests - National Database	M	Carbon in soil Carbon in litter	1990	Data for time horizons 2000-2005 are not available yet

[1)] Used as a methodological reference for calculation of the biomass stock.

7.2.2 Classification and definitions

National class	Definition
Definitions follow the Guidelines for Country Reporting to FRA-2005	

7.2.3 Original data

The original data for calculation of the carbon stock are presented in Table 6 (6.2.3, 6.3.2 and 6.5).

The soil carbon stocks were derived on the basis of soil carbon data from the set of ICP Forests plots (16 x16 km) in Slovakia (see table 7.2.1 Data sources) and calculated for soil depth of 100 cm. Default values for the estimate of soil carbon provided in the Guidelines for Country Reporting to FRA 2005, page 31, were not used. The values of carbon in litter were also derived from the national ICP Forests database for the year 1990. The values reported for 2000 and 2005 were recalculated using the living biomass / litter ratio.

The estimates of carbon stock in aboveground biomass, belowground biomass and dead wood biomass are based on the national coefficients of 49,9% for coniferous and 50% for broadleaved tree species.

Note: Overall figures concerning the Carbon Stock, including the above-ground biomass, below-ground biomass, dead wood and litter, have also been presented in the TBFRA 2000 for the year 1996 (167,02 million metric tonnes) and follow-up report of the Ministerial Conference on the Protection of Forests in Europe in 2001 (189,17 million metric tonnes).

7.3 Analysis and processing of national data

7.3.1 Calibration
Not needed.

7.3.2 Estimation and forecasting

All data concerning the carbon stock presented in the national table are expert estimates. More detailed assessments of the carbon stock and its balance are a subject of a research project "Influence of the global climate change on forests in Slovakia", implemented in 2003-2005.

Forecasting procedures are the same as in Table 6, section 6.3.2.

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	133.9	156.1	167.0	NDA	NDA	NDA
Carbon in below-ground biomass	28.8	33.7	35.9	NDA	NDA	NDA
Sub-total: Carbon in living biomass	**162,7**	**189,8**	**201,3**	NDA	NDA	NDA
Carbon in dead wood	12.5	14.5	15.7	NDA	NDA	NDA
Carbon in litter	16.7	19.5	20.7	NDA	NDA	NDA
Sub-total: Carbon in dead wood and litter	**29,2**	**34,0**	**36,4**	NDA	NDA	NDA
Soil carbon to a depth of 100 cm	**270.5**	**270.5**	**270.5**	NDA	NDA	NDA
TOTAL CARBON	**462,4**	**494,3**	**508,2**	NDA	NDA	NDA

7.6 Comments to National reporting table T7

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(s)	Year(s)	Additional comments
Varínsky et al. 2003: Occurrence of injurious agents in the forests of Slovakia for the year 2002 and their forecast for 2003, FRI Zvolen	H	ha, m^3	2003	Data on disturbance by fires, insects, fungi, other disturbance
Varínsky et al. 2002: Occurrence of injurious agents in the forests of Slovakia for the year 2001 and their forecast for 2002, FRI Zvolen	H	ha, m^3	2002	Data on disturbance by fires, insects, fungal diseases, other disturbance
Varínsky et al. 2001: Occurrence of injurious agents in the forests of Slovakia for the year 2000 and their forecast for 2001, FRI Zvolen	H	ha, m^3	2001	Data on disturbance by fires, insects, fungal diseases, other disturbance
Varínsky et al.2000: Occurrence of injurious agents in the forests of Slovakia for the year 1999 and their forecast for 2000, FRI Zvolen	H	ha, m^3	1999	Data on disturbance by fires, insects, fungal diseases, other disturbance
Varínsky et al. 1994: Occurrence of injurious agents in the forests of Slovakia for the year 1998 and their forecast for 1999, FRI Zvolen	H	ha, m^3	1998	Data on disturbance by fires, insects, fungal diseases, other disturbance
Surovec et al. 1993: Occurrence of injurious agents in the forests of Slovakia for the year 1992 and their forecast for 1993, FRI Zvolen	H	ha, m^3	1992	Data on disturbance by fires, insects, fungal diseases, other disturbance
Surovec et al., 1992: Occurrence of injurious agents in the forests of Slovakia for the year 1991 and their forecast for 1992, FRI Zvolen	H	ha, m^3	1991	Data on disturbance by fires, insects, fungal diseases, other disturbance
Surovec et al., 1991: Records on the injurious agents in the forests of SR for the year 1990 and their forecast for 1991. FRI Zvolen	H	ha, m^3	1990	Data on disturbance by fires, insects, fungal diseases, other disturbance
Surovec et al. 1990: Assessment of the occurrence of main injurious factors in the forests of SSR in 1989 and their forecast for 1990, VÚLH Zvolen	H	ha, m^3	1989	Data on disturbance by fires, insects, fungal diseases, other disturbance

Surovec et al., 1989: Assessment of the occurrence of main injurious factors in the forests of Slovak Socialist Republic in 1988 and their forecast for 1989, VÚLH Zvolen	H	ha, m^3	1988	Data on disturbance by fires, insects, fungal diseases, other disturbance
Lesoprojekt – Institute for Forest Management Planning	H	ha		Disturbance by fungal diseases
Ministry of Agriculture of SR: Report on Forestry in the Slovak Republic (Green Report). Annual reports from 1994 to 2004	H-M		1994-2002	Average growing stock per hectare, disturbance and damage to forests
PTEU - Fire Expertise Institute Bratislava, database	H	ha	1998-2004	Records on fires

8.2.2 Classification and definitions

National class	**Definition**
Disturbance by insects	Disturbance by bark beetles in m^3 of deadwood + disturbance by leaf-eating insects in heavily defoliated stands.
Disturbance by diseases	Area of forest stands visibly damaged by fungal diseases
Disturbance by air pollutants – Zone A	Areas, where the life expectancy of forest stands has been reduced to no more than 20 years from the beginning of intensive impact of air pollutants
Disturbance by wind, rime, frost, snow, drought	Cubic meters of wood originating in the felling of losses attributed to individual damaging factors.
Disturbance by game (browsing + peeling) and grazing	Area of young growths and forests stands damaged or destroyed.

8.2.3 Original data

FRA-2005 Categories		**Average annual affected area (1000 ha)**			
		Forest		**Other wooded lands**	
		1990	**2000**	**1990**	**2000**
Disturbance by fires		**0.5**	**0.5**	NDA	NDA
Disturbance by insects		**3.7**	**8**	NDA	NDA
Disturbance by diseases		**21.9**	**7**	NDA	NDA
Other disturbance*)	Game and grazing	**1.3**	**0.8**	NDA	NDA
	Air pollutants	**4.1**	**9.0**	NDA	NDA
	Abiotic factors	**4.8**	**6.0**	NDA	NDA
	Other	**1**	**1**	NDA	NDA

8.3 Analysis and processing of national data

For several kinds of disturbance, the national forestry records do not refer to the area of disturbed stands but the volume of deadwood or fellings of losses. Conversion from cubic meters to net cleared area of forest in hectares was done for the following types of disturbance: windstorms, fungal diseases, bark beetles, rime & frost and drought. As the disturbances by storms and bark beetles occur mostly in older stands, the mean growing stock of 400 $m^3.ha^{-1}$ was used for conversion in their case. Fires, disturbance by rime, fungi and drought appear to be unspecific to the age of forest stands. The mean growing stocks per hectare of 181 $m^3.ha^{-1}$ under bark in 1990 and 213 $m^3.ha^{-1}$ under bark in 2000, were therefore used for conversion.

8.3.1 Estimation and forecasting

Trend and perspective forecasting:

Disturbance by fires: the incidence of fires (not necessarily the area affected) correlates positively with drought, higher number of fires was recorded in the dry years 2000 and 2003.

Disturbance by insects: Bark beetles: The outbreaks follow larger damages caused by wind and snow. Important outbreaks were between 1997 and 2000. Leaf-eating insects: gradation of gypsy moth *Lymantria dispar* L. occurs once in 6-10 years. Gradation of this species started in 2003 and 2004, and will continuation in 2005. Gradation of cockchafers *Melolontha sp*. takes place once in 4-5 years, the last larger-scale one was in 2003 in Western Slovakia.

Disturbance by diseases tends to be decreasing. Specific types of damage, e.g. multi-causal Yellowing of Norway spruce Stands, and the area of forests damaged by honey fungus *Armilaria sp.* rise, however.

Other disturbance: Storms: significant windstorms occur once in 5-10 years. After their realatively low frequency in the beginning of 1990's, two significant large-scale windstorm disasters occurred in 1999 and 2004. The one of November 2004 is the largest one ever recorded in the territory of the country. The drought is of increasing significance, two exceptionally extreme years were 2000 and 2003. Rime: significant damage occurs once in 5-10 years, a last large-scale disturbance was present in 2001. The effects of air pollution: after a serious increase in the 1980's and 1990's, the disturbance seem to stable to slightly decreasing. The disturbance by game shows, after its very high level in the 1990's, a slightly decreasing trend.

8.4 Reclassification into FRA 2005 classes

8.5 Data for National reporting table T8

FRA-2005 Categories	Average annual area affected (1000 hectares)			
	Forest		Other wooded land	
	1990	2000	1990	2000
Disturbance by fire	0.5	0.5	NDA	NDA
Disturbance by insects	3.7	8.2	NDA	NDA
Disturbance by diseases	21.9	7	NDA	NDA
Other disturbance	11.3	16.8	NDA	NDA

8.6 Comments to National reporting table T8

The basic sources of information were: the Forestry Statistical Record "L116: Report on the occurrence of injurious agents", Database of the Lesoprojekt (Forest Inventory and Management Plannning Institute) and the Fire Expertise Institute Bratislava. Regarding the disturbance by fires the forestry records "L116" were combined with data provided by the Institute for Fires and Expertise in Bratislava. In the forestry records L116, some overlaps of several factors (combined damage) may be have been reported for some forest compartments
The accuracy of data on forest disturbance was high until the year 1990 when state forest enterprise managed almost 100% of forest. In 2000, pursuant to the restitution of non-state forest holdings, the forest area covered by reliable annual records represents some 85% of the forest.

Serious events of the last years with a significant impact on the health of forest stands:
- Large-scale windstorm disturbances in 1996 and 2004,
- Country-wide gradation of *Lymantria dispar* in oak stands in 2003-2004,
- Extreme droughts on the whole territory in 2000 and 2003.

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
IUCN Red List of Threatened Species. <www.redlist.org>. Downloaded on 05 January 2005.	H	Internationally recognized Redlisted species	(2000)	
Marhold, K., Hindák F. (eds.), 2003: Zoznam nižších a vyšších rastlín Slovenska [Checklist of non-vascular and vascular plants of Slovakia]	H	National checklist of plant taxa	1998	Includes lower, usually hybridogeneous taxa of tree species with internationally unclear taxonomic status
Feráková, V., Maglocký, Š., Marhold, K., 2001: Červený zoznam papraďorastov a semenných rastlín Slovenska (December 2001) [Redlist of ferns and flowering plants of Slovakia, December 2001]. Ochrana Prírody 20 (Suppl.): 44-81	H	National list of Critically Endangered, Endangered and Vulnerable species of higher plants	2001	Includes subspecies and hybridogenous taxa which taxonomic status has not been recognized internationally.
Čeřovský, J., Feráková, V. et al., 1999: Červená kniha ohrožených a vzácných druhů rostlin a živočichů ČR a SR. Vyšší rostliny [Red book of endangered and rare species of plants and animals of the Czech and Slovak Republics. Higher plants.]. Príroda, Bratislava, 456 s.	M	Critically Endangered, Endangered and Vulnerable species of higher plants	1998	

9.2.2 Classification and definitions

National class	Definition
National categories are compliant with FRA-2005	

9.2.3 Original data

Original data are present in the national reporting table.

9.3 Data for National reporting table T9

FRA 2005 Categories	Number of species 2000
Native tree species	59
Critically endangered tree species	0
Endangered tree species	0
Vulnerable tree species	1

Source: IUCN Red List by 2000: *Betula oycoviensis* BESSER. Source: IUCN Red List of Threatened Species. <www.redlist.org>. Downloaded on 05 January 2005.

9.4 Comments to National reporting table T9

The summary includes autochthonous species of trees, i.e. plant which have one one main stem and are capable to reach the height of 5 m in maturity. In accordance with the Guidelines for National Reporting to FRA 2005, all identified autochthonous species are included.

In addition to the 59 species listed in the table, the Checklist of Lower and Higher Plants of Slovakia (MARHOLD & HINDÁK, 1998), recognizes 23 neo-endemic hybridogenous species with internationally uncertain taxonomic status (22 rowan and 1 *Malus*).

The reported tree species according to the genera: *Acer* – 4, *Alnus* – 2, *Betula* – 3, *Carpinus* – 1, *Cerasus* – 2, *Cornus* – 1, *Cotinus* – 1, *Crataegus* – 2, *Fagus* – 1, *Fraxinus* – 3, *Frangula* – 1, *Juniperus* – 1, *Larix* – 1, *Malus* – 1 + 1 hybridogenous taxon, *Padus* – 1, *Picea* – 1, *Pinus* – 2 + 1 hybridogenous taxon, *Pyrus* – 2, *Populus* – 4, *Quercus* – 9, *Salix* – 4, *Sambucus* – 1, *Sorbus* – 4 + 22 hybridogenous taxa, *Taxus* – 1, *Tilia* – 2, *Ulmus* – 3.

If the Redlist of Ferns and Flowering Plants of Slovakia as of December 2001 (Feráková, V., Maglocký, Š., Marhold, K., 2001) was applied, the national reporting table would be as follows:

FRA 2005 Categories	Number of species 2000
Native tree species	92 (59 + 23*)
Critically endangered tree species	1+1*
Endangered tree species	1
Vulnerable tree species	4 +4*

***** Neo-endemic hybridogenous species listed in the Checklist of Lower and Higher Plants of Slovakia (MARHOLD & HINDÁK 1998), which status does not appear to be accepted internationally.

The redlisted tree species would have been:

Pinus x rotundata LINK. in IUCN category "CR",
Cotinus coggygria SCOP in IUCN category "EN",
Betula oycoviensis BESSER. in IUCN category "VU",
Quercus pedunculiflora K.KOCH in IUCN category "VU",
Q. frainetto TEN. in IUCN category "VU",
Pinus cembra L. in IUCN category "VU".

The redlist includes another 5 neo-endemic hybridogenous taxa with unclear taxonomical status:

Sorbus graeca (SPACH) LODD. ex. S.SCHAUER in the category "CR",
Sorbus pekarovae MÁJOVSKÝ and BERNÁTOVÁ in the category "VU",
Sorbus hazslinskyana (SÓO) MÁJOVSKÝ in the category "VU",
Sorbus margittaiana (JÁV.) KÁRPÁTI in the category "VU",
Sorbus scepusiensis KOVANDA in the category "VU".

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
Summary Forest Management Plan 1988, Lesoprojekt Zvolen	H	Growing stock of wood with dbh > 7 cm under bark, tree species, age classes, yield classes	1988	National Forest Inventory
Database Summaries of the National Forest Inventory (SLHP, PIL), Lesoprojekt Zvolen	H	Growing stock of wood with dbh > 7 cm under bark, tree species, age classes, yield classes	2000 2003	Some complementary data obtained also from the Forest Information Centre of Lesoprojekt Zvolen

10.2.2 Original data

FRA 2005 Categories/ Species name (Scientific and common name)	Growing Stock in Forests (Million m ^{3})		
	1988	**2000**	**2003**
Picea abies / Norway spruce	131.3	156.3	158.2
Fagus sylvatica / European beech	107.6	139.2	149.6
Quercus / Oak including *Q. petraea* (sessile oak), *Q. robur* (pedunculate oak) and *Q. cerris* (Turkey oak).	57.2	60.4	61.1
Genus *Pinus* / Pine including P. silvestris (Scots pine) and *P. nigra* (Austrian black pine)	24.6	29.4	30.6
Abies alba / European silver fir	34.8	27.6	26.8
Carpinus betulus / European hornbeam	11.4	18.2	21.2
Larix decidua / European larch	4.6	7.2	8.0
Genus *Acer* / maple including *Acer platanoides* (Norway maple), *Acer pseudoplatanus* (sycamore maple) and *Acer campestre* (field maple)	3.3	5.0	5.6
Genus *Fraxinus* [4)] including *Fraxinus excelsior* (common ash) and *Fraxinus angustifolia* (narrow-leaved ash)	2.7	5.0	5.5
Robinia pseudoacacia / black locust	3.9	4.8	4.6
Other tree species	7.9	10.1	10.7
TOGETHER	**389.3**	**463.2**	**481.9**

10.3 Analysis and processing of national data

Since the records of the national forest inventory contain, in accordance with the national law, data for wood under bark, the following conversion coefficients from m^3 under bark to m^3 over bark were have been applied: - 1.10975 for softwoods and
- 1.12044 for hardwoods.

10. 3. 1 Calibration
Not needed.

10.3.2 Estimation and forecasting

FRA 2005CATEGORIES / SPECIES NAME (SCIENTIFIC AND COMMON NAME)	Growing Stock in Forests (Million m ^{3})		
	1988	1990*	2000
Picea abies / Norway spruce	131.3	135.5	156.3
Fagus sylvatica / European beech	107.6	112.9	139.2
Quercus / Oak	57.2	57.7	60.4
Pinus / Pine	24.6	25.4	29.4
Abies alba / European silver fir	34.8	33.6	27.6
Carpinus betulus / European hornbeam	11.4	12.5	18.2
Larix decidua / European larch	4.6	5.0	7.2
Acer / Maple	3.3	3.6	5.0
Fraxinus / Ash	2.7	3.1	5.0
Robinia pseudoacacia / black locust	3.9	4.1	4.8
Other tree species	7.9	8.3	10.1
TOTAL	**389.3**	**401.6**	**463.2**

* Figures referring to 1990 represent a linear interpolation of data for 1988 and 2000!

10.4 Data for National reporting table T10

FRA 2005 Categories / Species name (Scientific name and common name)	Growing Stock in Forests (million m^3)	
	1990	2000
Picea abies / Norway spruce	135.5	156.3
Fagus sylvatica / European beech	112.9	139.2
Quercus / Oak including *Q. petraea* (sessile oak), *Q. robur* (pedunculate oak) and *Q. cerris* (Turkey oak).	57.7	60.4
Genus *Pinus* / Pine including *P. silvestris* (Scots pine) and *P. nigra* (Austrian black pine)	25.4	29.4
Abies alba / European silver fir	33.6	27.6
Carpinus betulus / European hornbeam	12.5	18.2
Larix decidua / European larch	5.0	7.2
Genus *Acer* / maple including *Acer platanoides* (Norway maple), *Acer pseudoplatanus* (sycamore maple) and *Acer campestre* (field maple)	3.6	5.0
Genus *Fraxinus* [4)] including *Fraxinus excelsior* (common ash) and *Fraxinus angustifolia* (narrow-leaved ash)	3.1	5.0
Robinia pseudoacacia / black locust	4.1	4.8
Other tree species	8.3	10.1
TOTAL	**401.6**	**463.2**

10.5 Comments to National reporting table T10

Present figures refer to the minimum measured diameter (DBH, top end of a stem, branches) of 7 cm.

Total proportion of coniferous tree species in the growing stock has been slightly but continuously decreasing from 50.2 % in 1988 to 46.4 % in 2003. *Vice versa*, the proportion of broadleaves increased from 49.8 % to 53.6 %. In spite of a general increase of the growing stock of all forests, the stock of European silver fir has decreased as a result of its complex dieback, which became widespread in the 1960's.

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 (fuelwood).
Fuelwood 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
Ministry of Agriculture of the Slovak Republic: Analysis of Wood Removal	H	Industrial Roundwood Supply, Wood Supply, Wood Fuel Supply	1990-1993	The analysis provides data series for 1987-1992
Ministry of Agriculture of the SR: Report on Forestry in the Slovak Republic (Green Report).	H	Industrial Roundwood Supply, Wood Supply, Wood Fuel Supply	1993-2004	The reports provide data series from 1991 to 2003

11.2.2 Classification and definitions

National class	Definition
FRA 2005 categories were applied	FRA definitions were used

11.2.3 Original data

Calculated production by assortments of stemwood	m^3 under bark (5-year averages)	
	1990	2000
Coniferous sawlogs and veneer logs	1 426 813	1 519 923
Non-coniferous sawlogs and veneer logs	952 878	740 432
Coniferous pulpwood	746 703	1 068 559
Non-coniferous pulpwood	1 228 021	1 645 330
Coniferous fuelwood	141 844	145 520
Non-coniferous fuelwood	285 370	151 714
Other coniferous roundwood	128 595	149 386
Other non-coniferous roundwood	62 123	95 807
TOTAL	**4 972 347**	**5 516 671**

11.3 Analysis and processing of national data

Since the national records and statistics provide information for wood under bark, the following conversion coefficients from m^3 under bark to m^3 over bark were have been applied:

- 1.10975 for coniferous and
- 1.12044 for non-coniferous.

11.3.1 Calibration

Not needed.

11.3.2 Estimation and forecasting

Estimation was not needed. Forecasting for 2005 is a linear extrapolation reflecting continuously increasing wood removals since 1997. The obtained value is corrected according to the expert knowledge. The account was taken of the volume of wood (over 5 mill. m^3) thrown by the windstorm which struck northern Slovakia in November 2004.

11.4 Reclassification into FRA 2005 classes

Assortment	Industrial roundwood	Fuelwood
	%	%
Coniferous sawlogs and veneer logs	100	
Non-coniferous sawlogs and veneer logs	100	
Coniferous pulpwood	100	
Non-coniferous pulpwood	100	
Coniferous fuelwood		100
Non-coniferous fuelwood		100
Other coniferous roundwood	100	
Other non-coniferous roundwood	100	

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	5073	5819	6372	NDA	NDA	NDA
Fuelwood	472	331	360	NDA	NDA	NDA
TOTAL for Country	**5 545**	**6 150**	**6732**	**NDA**	NDA	NDA

11.6 Comments to National reporting table T11

12 Table T12 – Value of wood removal

12.1 FRA 2005 Categories and definitions

12.2 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 (fuelwood).
Value of fuelwood removal	Value of the wood removed for energy production purposes, regardless whether for industrial, commercial or domestic use.

12.3 National data

12.2.1 Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Ministry of Agriculture of the Slovak Republic: Analysis of Wood Removal	H	Industrial Roundwood Supply, Wood Supply, Wood Fuel Supply	1990-1993	The analysis provides data series for 1987-1992
Ministry of Agriculture of the SR: Report on Forestry in the Slovak Republic (Green Report).	H	Industrial Roundwood Supply, Wood Supply, Wood Fuel Supply	1993-2004	The reports provide data series from 1991 to 2003

12.2.2.Classification and definitions

National class	Definition
Compliant with FRA 2005	

12.2.3 Original data

Supply of wood taken from Table 11. Original data on annual wood removals represent 5-year averages 1988-1992 and 1998-2002.

Calculated production by assortments	m^3 under bark (5-year averages)	
	1990	**2000**
Coniferous sawlogs and veneer logs	1 426 813	1 519 923
Non-coniferous sawlogs and veneer logs	952 878	740 432
Coniferous pulpwood	746 703	1 068 559
Non-coniferous pulpwood	1 228 021	1 645 330
Coniferous woodfuel	141 844	145 520
Non-coniferous woodfuel	285 370	151 714
Coniferous other round wood	128 595	149 386
Non-coniferous other round wood	62 123	95 807
Removals total	**4 972 347**	**5 516 671**

Indicative average prices per m³ of wood under bark (arithmetic means for the 5-year periods 1988-1992 and 1998-2002)

Assortment of stemwood	1990 [CSK]	2000 [SKK]
Coniferous roundwood	692	1 436
Non-coniferou roundwood	641	1 164
Coniferous pulpwood	470	987
Non- coniferous pulpwood	403	791
Coniferous fuelwood	175	262
Non-coniferous fuelwood	240	441
Roundwood	670	1 278

Values of wood supply in individual years were products of supplied volumes of assortments and their prices in the same year. The above table provides thus only indicative means for the mid years of both reference periods.

The mean values of roundwood supply for 1990 and 2000 were calculated as averages of the values of supply in individual years of the reference periods 1988-1992 and 1998-2002:

Assortment	**1990 [mill. CSK]**	**2000 [mill. SKK]**
Coniferous industrial roundwood	1 666	4 103
- of which coniferous pulpwood	*351*	*1 055*
Non-coniferous industrial roundwood	1 553	2 998
- of which non-coniferous pulpwood	*495*	*1 301*
Wood fuel of stem wood coniferous	25	38
Wood fuel of stem wood non-coniferous	68	67
Roundwood	3312	7206

Summary value of wood removals in million CSK and SKK:

FRA 2005 Categories	**Forest**			**Other wooded land**		
	1990 mill CSK	2000 mill SKK	2005 mill SKK	1990 mill. CSK	2000 mill.SKK	2005 mill.SKK
Industrial roundwood	3 219	7 101	7 908	NDA	NDA	NDA
Fuel from wood	93	105	137	NDA	NDA	NDA
TOTAL for the country	3312	7 206	8 045	NDA	NDA	NDA

Note: The National Report for UN-ECE/FAO TBFRA-2000, Table 25, includes also "Other Wood Products" valued to 132 million SKK, referring to the data of the Statistical Office of SR. But it was not possible to prove the origin of these "Other Wood Products" in a forest and take them as a part of forest production subsequently.

12.4 Analysis and processing of national data

All wood removals are calculated under bark.

Values in the National Reporting Table are average volumes of delivered assortments in individual years falling into the reference period 1988-1992 and 1998-2002.

The exchange rates of USD given in Appendix 4 of the Guidelines for Country Reporting to FRA-2005 were used for the period 1998-2000 and for 2005 (2003: 25.65 SKK/ 1 USD). The exchange rate of the Czechoslovak Koruna (CSK) for 1990 is not available in Appendix 4, however. The official exchange rate of the Czechoslovak National Bank by the end of 1990 (28,3 CSK/ 1 USD) was used.

12.3.1 Estimation and forecasting

Estimation was not needed. Forecasting for 2005 follows the mid-term trend of gradually increasing wood removals and their values since 1990. It also reflects the expected effect of the large windstorm, which struck northern Slovakia in November 2004 and has thrown over 5 million cubic meters of predominantly coniferous stands.

12.4 Reclassification into FRA 2005 classes

Not needed.

12.5 Data for National reporting table T12

FRA 2005 Categories	Value of wood removal (1000 USD)					
	Forest			Other wooded land		
	1990	2000	2005	1990	2000	2005
Industrial roundwood	113746	149842	308304	NDA	NDA	NDA
Fuelwood	3286	2215	5341	NDA	NDA	NDA
TOTAL for the Country	**117 032**	**152 057**	**313 645**	NDA	NDA	NDA

12.6 Comments to National reporting table T12

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
Statistical Yearbook on Hunting	H to M, summary data	Bush meat, trophies hides, skins, living animals	1995-2003	Worked out every year on the basis of annual reports of hunting association, subjects of overhead and private hunting grounds
Konôpka, J. et al. Analýza vývoja a súčasného stavu LH SR (1990-1998) (Analysis of the development and current state in the forest sector of SR)	H to M, summary data	Living animals, Trophies, Forest fruits, mushrooms	1990-1998	Source of data and information were research reports, examinations, statistical reports, customs statistics
Ministry of Agriculture of SR: Report on Forestry in the Slovak Republic (Green Report). Annual Reports.	H to M	bush meat, living animals trophies	1993-2003	Worked out since 1993 every year from official state and sector reports, accounting reports, annual reports on management and special questionnaires from reporting units of information network
Tutka, J. Data and information for the national account	H to M summary data	Potential and actual production of forest fruits	2000-2002	Source of information are the results of research (domestic and foreign), Statistical Yearbook on Hunting, Customs Statistics, Green Report, etc.

Tutka, J. et al. [Potential and actual value of wood production function of a forest]. ZS ČP05 E01, Zvolen 2002, 34p.	H to M, summary data	Potential and actual production of forest fruits, etc.	2002	PFI, Results of field examinations on the territory of Slovakia
Šišák, L., 1997: Význam produkce lesa kromě dřeva ČR. [Importance of forest production other than wood in the Czech Republic). Lesnic tví – Forestry 43, p. 49-66	H to M, summary data	Actual production of forest fruits obtained in the surveys of agencies	1997	Results of several year lasting examination of survey agencies

13.2.2 Classification and definitions

National class	Definition
Compliant with FRA 2005, see 13.2.3 Original data	

13.2.3 Original data

FRA 2005 Category	Amount obtained by picking* / Removal	Altogether		
PLANT PRODUCTS / RAW MATERIAL	**Measuring unit**	**1990**	**2000**	**2005****
1. FOOD				
Bilberry	1000 kg	180	130	120
Cranberry	1000 kg	7	5	5
Raspberry	1000 kg	140	125	120
Blackberry	1000 kg	30	25	20
Rose hips	1000 kg	50	45	40
Hazelnuts	1000 kg	15	12	10
Other forest fruits strawberry, blackthorn, elderberry, hawthorn, sweet cherry)	1000 kg	45	40	40
Together	1000 kg	867	772	755
Fresh mushrooms (edible mushrooms, all species)	1000 kg	400	390	400
2. FODDER				
Hay for animals and horses	1000 kg	120[4]	130[4]	140[4]
3. RAW MATERIAL FOR MEDICINE AND AROMATIC PRODUCTS				
Medicinal plants	1000 kg	180	150	160
4. RAW MATERIALS FOR COLORANTS AND DYES				
5. RAW MATERIAL FOR UTENSILS, HANDICRAFTS & CONSTRUCTION				
Birch and other wicker	1000 kg	15[1]	10[1]	10[1]
Hazelnut poles for crops	10^3 pcs	600[2]	500[2]	400[2]
Small-dimension elder (*Sambucus*) stems for musical instruments	10^3 pcs	10^3	12^3	12^3
6. ORNAMENTAL PLANTS	10^3 pcs	450	390	370

Christmas trees Branches, twigs and cones, evergreens	1000 kg	270	250	250
TOGETHER	10^3 pcs 1000 kg	450 270	390 250	370 250

[1] Estimation on the basis of annual offer of brooms at selected market places.
[2] Estimation was done on the basis of actual number of hobby-gardeners in Slovakia. It is supposed that 1/3 of the number of gardeners harvest 10 new hazelnut poles per year as supports for the bean and pea crops.
[3] Estimation on the basis of the offer of Slovak folk instruments (shepherds' long pipes and pipes sold at open markets, souvenir shops and folk festivals.
[4] Estimation on the basis of census numbers of forest game and stock of horses used for timber skidding.
[*] Domestic buy out + export + own consumption.
[**] A drop is expected due to cultivation in plantations located mostly on farmlands.

FRA 2005 Category	**Amount obtained in picking/ hunt**	**Altogether**		
ANIMAL PRODUCTS / RAW MATERIAL	**Measuring unit**	**1990**	**2000**	**2005**
9. LIVING ANIMALS*				
Red deer	individuals	30	20	25
Fallow deer	individuals	60	50	50
Mouflon	individuals	100	100	100
Wild boar	individuals	50	50	50
Hare	individuals	10 000	11 000	10 000
TOGETHER	individuals	10 240	11 220	10 225
10. HIDES, SKINS AND TROPHIES				
Antlers– red deer	10^3 pcs	4,0	3,5	3,0
Antlers – roe deer	10^3 pcs	7,5	7	7
Fox– pelts from whole body	10^3 pcs	10	10	11
Bear – pelts with skull	pcs	40	30	50
Wolf – pelts with skull	pcs	100	90	100
Lynx – pelts with skull	pcs	80	-	-
Marten – pelts from whole body	pcs	1 500	1 400	1 400
TOGETHER	pcs	23 070	22 040	22 470
12. BUSH MEAT				
Red deer	10^3 individuals /1000 kg	6.3/441	9.6/672	8.0/560
Fallow deer		0.9/31.5	1.3/45.5	1.0/35.0
Roe deer		11.9/154.7	15.5/201.5	14/182.0
Mouflon		0.8/14.4	1.7/30.6	1.5/27.0
Wild boar		14.4/57.6	16.4/656	16.0/640
Hares		8.9/35.6	22.3/89.2	23.0/92.0
Pheasants		24.7/37.0	90.3/135.5	95/142.5
Rare game		0.2/16.0	0.07/5.6	0.01/0.8
Other game		15/7.5	18.8/9.4	17.0/8.5
TOGETHER		83.1/1313.7	175.97/1254.9	175.51/1687.8

***** Living animals caught and redistributed for the purpose of re-population or hunting to another hunting grounds.

13.3 Analysis and processing of national data

13.3.1 Estimation and forecasting

Estimates concerning the reference periods 2000 and 2005 are described in the notes to the tables in subsection 13.2.3. They were used when representative data were not available or they were fragmentary. Extrapolations were applied where information was available for other than the reference periods.

The forecasts for 2005 follow linear extrapolations corrected by expert estimates.

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	10^3	kg	1267	1162	1155
2. Fodder	10^3	kg	120	130	140
3. Raw material for medicine and aromatic products	10^3	kg	180	150	160
4. Raw material for colorants and dyes					
5. Raw material for utensils, handicrafts & construction	10^3 10^3	kg pcs	15 615	10 510	10 410
6. Ornamental plants	10^3 10^3	pcs kg	200 277	150 255	150 255
7. Exudates					
8. Other plant products					
Animal products / raw material					
9. Living animals	10^3	individuals	10.2	11.2	10.2
10. Hides, skins and trophies	10^3	pcs	23.07	22.04	22.47
11. Wild honey and bee-wax	-	-	-	-	-
12. Bush meat	10^3 10^3	pcs kg	83.1 1313.7	175.97 1254.9	175.51 1687.8
13. Raw material for medicine					
14. Raw material for colorants					
15. Other edible animal products					
16. Other non-edible animal products					

13.6 Comments to National reporting table T13

The national reporting table contains either 5-year averages or estimates for the same periods. Estimates and extrapolations were used when data were deficient or they did not refer to the required period. Individual cases are described in the notes to the original data tables in subsection 13.2.

The table presents products that grow on forestland and are picked for sale or own consumption. The data originate in own research for the period 2000-2002, export statistics, customs statistics (1993-

1995), questionnaires, interviews with purchasers of NWFP for industrial processing in the SR (1990-1995), and in several-year-lasting examination carried out by survey agencies in the Czech Republic (1994-2000) following the methodology of ŠIŠÁK 1997. They cover the following non-wood forest products: blackthorn fruits, mushrooms, rose hips, raspberries, blackberry, bilberry, rowan, elderberry, juniper, cranberry, and hazelnut. The volume and sales of venison follow hunting statistics of the SR for the years 1995-2003. The prices of venison, trophies of animals and animal species were obtained from the pricelists of the state enterprise Forests of the Slovak Republic (Lesy SR, š.p.). The estimate of the total volume and mean price of medicinal plants in $SKK.kg^{-1}$ is based on the customs statistics (customs declarations), and information from the merchants and processors of medicinal plants for the period 1993-1998.

The volume of mosses and lichens, leaves, branches with and without flowers for decorative purposes, was obtained from the customs statistics and data of the state forests.

Skins & pelts:
Data were obtained from the customs statistics as an average for the years 1993-1995, when 330 kg of fox pelts with the value of 1.02 mil. SKK were exported per year. Since that period, the exports as well as the prices have decreased.

Christmas trees:
Annual number was estimated according to the number of families, churches, vicar's offices, enterprises of legal entities, firms owned by physical persons, which buy or have Christmas trees from domestic production. The calculation included:

a. 3 Christmas trees per 1 church (4 551 churches in SR),
b. 2 Christmas trees per 1 vicar's office (960 vicar's offices in SR),
c. 1 Christmas tree per 0.3 of the offices of legal entities (58 000 legal entities),
d. 1 Christmas tree per 0.1 of smaller firms (295 750 enterprises of physical persons),
e. 1 Christmas tree in ¼ of Slovak families, number of families 1 250 000 >>> number of Christmas trees 1 250 000.0.25 = 312 500.

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

Data sources

References to sources of information	Quality (H/M/L)	Variable(s)	Year(s)	Additional comments
Statistical Yearbook on Hunting.	H to M, summary data	Bush meat, trophies hides, skins, living animals	1995-2003	Worked out every year on the basis of annual reports of hunting association, subjects of overhead and private hunting grounds
Konôpka, J. et al. Analýza vývoja a súčasného stavu LH SR (1990-1998) (Analysis of the development and current state in the forest sector of the SR).	H to M, summary data	Living animals, Trophies, Forest fruits, mushrooms	1990-1998	Source of data and information were research reports, examinations, statistical reports, customs statistics
Ministry of Agriculture of the SR: Report on Forestry in the Slovak Republic (Green Report). Annual reports.	H to M	bush meat, living animals trophies	1993-2003	Worked out since 1993 every year from official state and sector reports, accounting reports, annual reports on management and special questionnaires from reporting units of information network
Tutka, J. Data and information for the national account.	H to M summary data	Potential and actual production of forest fruits	2000-2002	Source of information are the results of research (domestic and foreign), Statistical Yearbook on Hunting, Customs Statistics, Green Report, etc.

Tutka, J. et al. [Potential and actual value of wood production function of a forest]. ZS ČP05 VE01, Zvolen 2002, 34p.	H to M, summary data	Potential and actual production of forest fruits, etc.	2002	PFI, Results of field examinations on the territory of Slovakia
Šišák, L. Význam produkce lesa kromě dřeva ČR. [Importance of forest production other than wood in the Czech Republic). Lesnictví – Forestry, 43, p. 49-66	H to M, summary data	Actual production of forest fruits obtained in the surveys of agencies	1997	Results of several year lasting examination by survey agencies

14.2.2 Classification and definitions

National class	Definition
The same as in Table 13	

14.2.3 Original data

FRA 2005 Category	Value of obtained non-wood forest products (1000 SKK)		
	1990	2000	2005
Plant products / raw material			
1. Food	22 100	30 648	40 790
2. Fodder	12 000	19 500	23 800
3. Raw material for medicine and aromatic products	6 300	19 500	33 600
4. Raw material for colorants and dyes			
5. Raw material for utensils, handicrafts & construction	745	1 780	2 410
6. Ornamental plants	12 600	38 800	54 300
7. Exudates (saps, resins)			
8. Other plant products			
Animal products / raw material			
9. Living animals	11 264	31 192	32 720
10. Hides, skins and trophies	27 684	78 242	94 374
11. Wild honey and bee-wax			
12. Bush meat	7 748	80 658	100 920
13. Raw material for medicine			
14. Raw material for colorants			
15. Other edible animal products			
16. Other non-edible animal products			
TOTAL	**100 441**	**300 320**	**382 914**

14.3 Analysis and processing of national data

14.3.1 Estimation and forecasting

Forecasting was done as an extrapolation of available information combined with expert estimates. The both volume and price changes were considered.

The exchange rate given in Appendix 4 of the Guidelines for Country Reporting to FRA-2005 was used for conversion of SKK to USD in 2000 (47.39 SKK / 1 USD). The exchange rate for 2003 (32.98 SKK / 1 USD) was used for 2005. The exchange rate of Czechoslovak Koruna (CSK) for 1990 is not available in Appendix 4 of the Guidelines. The mean exchange rate of the Czechoslovak National Bank for 1990 (28.3 CSK / 1 USD) 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	781	647	1237
2. Fodder	424	411	722
3. Raw material for medicine and aromatic products	223	411	1019
4. Raw material for colorants and dyes			
5. Raw material for utensils, handicrafts & construction	26	38	73
6. Ornamental plants	445	819	1646
7. Exudates			
8. Other plant products			
Animal products / raw material			
9. Living animals	398	658	992
10. Hides, skins and trophies	978	1651	2862
11. Wild honey and bee-wax			
12. Bush meat	274	1702	3060
13. Raw material for medicine			
14. Raw material for colorants			
15. Other edible animal products			
16. Other non-edible animal products			
TOTAL	3 549	6 337	11 610

14.6 Comments to National reporting table T14

Not needed.

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, fuelwood 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	Additional comments
Lacko, M. et al.: [Prognoses and documents on the care of workers in the forest sector], 1992, FRI Zvolen	H	Number of employees in forest sector	1992	Data series 1988-1992
Ministry of Agriculture of SR: Report on Forestry in the Slovak Republic 2003 (Green Report).	H	Number of employees in forestry	1999 -2003	
LACKO et al., 2002: Lesníctvo a rozvoj vidieka [Forestry and rural development]. Záverečná správa čiastkového vedecko technického projektu 2731-05 [Final Research Report]. Lesnícky výskumný ústav, 121 pp. + annexes.	M-H	Total number of employees in forestry and related services including outsourcing by 2001	2002	

15.2.2 Classification and definitions

National class	Definition
National classes are compliant with FRA 2005	

15.2.3 Original data

Summarized data originating in the above mentioned sources of information are present in the national reporting table.

15.3 Analysis and processing of national data

15.3.1 Estimation and forecasting

Not required

15.4 Reclassification into FRA 2005 classes

Presented data include person-years of (i) full-time and (ii) part-time workers of forest enterprises, and (iii) estimated person-years of outsourced works.

The data on full time and part time workers cover

a) all state forest enterprises, which managed 100% of forest in 1990, 65% in 2000 and 61.5% in 2004 and
b) statistical sample of non-state forest holdings recalculated to all non-state forests.

Data concerning outsourced works delivered by firms and self-employed workers come from the research carried out in 2000-2002 (LACKO et al. 2002).

15.5 Data for National reporting table T15

FRA 2005 Categories	Employment (1000 person-years)	
	1990	**2000**
Primary production of products	33.03	23.97
Provision of services	1.65	1.50
Unspecified forestry activities	1.62	1.24
TOTAL	36.30	26,71

15.6 Comments to National reporting table T15

Presented data correspond with the ILO statistics concerning employment in forestry, logging and related services: 36,300 workers in 1990 and 26,600 workers in 2000. These figures have been a result of estimation based on the partial statistics available.

Employment in Forestry shows a steady decrease because of the increasing productivity but also

- Increased amount of unpaid works performed by individual forest owners and co-owners (members of land associations) for subsistence as well as for commercial purposes.
- Reduced extent of construction and repair of forest roads, torrent control and other engineering activities since 1990.
- Considerable volume of outsourced works delivered to the private forest owners and enterprises has not been covered by the forestry records neither the national labor statistics. The contractors delivering such works have either been individuals or small companies with less than 25 employees. The outsourcing has been prevailing in both private and state-owned forest holdings, however.

Provision of Services represents an estimate based on the staff number and capacities in man year involved in the construction and maintenance of forest roads and torrent control, maintenance of other forest infrastructure available to the public, staff of the national and landscape parks, forest and nature protection guard dealing with forests.

The Unspecified Forestry Activities include forest management planning, state forest administration, technical education, training, advising and research.