

# An Overview of Forest Management Development in Slovakia

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## *Abstract – Nacrtak*

*This article deals with forest management as a sector of national economy, whose main aim is the holistic and sustainable management of forests in Slovakia and their further development. The article discusses the issue of the current situation in forests and forestry in Slovakia, not only from the aspect of the extent of forest land and forest stands, but also from the aspect of tree species composition, timber felling and logging, forest opening up by forest roads, application of technologies in forestry, principles of timber felling and the resulting obligations for the staff responsible for the keeping of ecological principles.*

*Keywords: forest, forest management, timber felling, growing stock*

## **1. Introduction – Uvod**

Forests of Slovakia are the natural heritage, which presents in the long-run the state and development of society on national, European, but also on a global scale. Biological diversity in the form of variety of fauna and flora species and the stability of forest ecosystems have been kept thanks to the effort of many generations of foresters who systematically preserved, enhanced and purposefully managed the forest. They are also an integral part of a complex image of Slovakia. Whether we are talking about the surrounding of rivers or about our mountains, the forest is almost always somewhere on the horizon. The forest and everything that has lived in it for centuries coexisted in almost perfect harmony. In the forest, everything has its place, its meaning and its duration. Forests are our national wealth and this wealth must be treated very carefully and wisely. Forests have accompanied man from his beginnings until the present day, and without forests and their products, man would probably not be able to reach the current level of development and knowledge (Miniáš at al. 2006). The relationship between man and forest is reflected in the fact that people are getting increasingly aware of the indispensable role of forests for the human existence and therefore nowadays more attention is paid to forests than in the past. Therefore, let us preserve (conservation) the

forests in Slovakia and also in Europe and improve (developing) them to keep their benefits for the next generations.

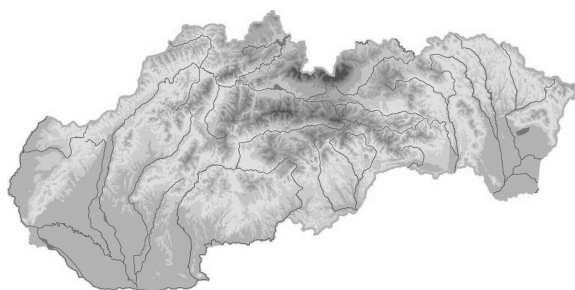
## **2. Scope of research – Problematika istraživanja**

### **2.1 General characterization of the current situation in forests and forest management in Slovakia – Osnovne karakteristike postojećega stanja šuma u Slovačkoj**

Forest cover in different regions of Slovakia is very different. The area of the forest cover is the lowest in Podunajská and Východoslovenská lowland. The Vihorlatské vrchy, Nízke Tatry Mts. and Spišsko-Gemerský karst are characterized by a high forest cover area. The total area of Slovakia is 4 903 397 ha, of which 2 006 639 ha is forest land, 1 930 570 ha agricultural land, 872 863 ha other land and 93 325 ha is water area.

### **2.2 Categorization of forests in Slovakia – Podjela šuma u Slovačkoj**

Act No. 326/2005 Collection of Laws on Forests, forests for the use of their capacity as member of Commercial, Protective and Special purpose forests.



**Fig. 1** Map of Slovakia  
**Slika 1.** Karta Slovačke

### 2.3 Natural conditions – Prirodni uvjeti

The climatic variability related to particular habitats in forestry is mainly expressed by vegetation stages. In Slovakia we distinguish eight vegetation stages. The properties of individual habitats are relatively stable and change only slowly. Most of the forests in Slovakia are located in mountains, in locations that were unsuitable for intensive agriculture

due to steep slopes, shallower and stony soils and colder climate. Table 2 shows the extent of the area classified into categories based on slope intervals. In Slovakia most of the terrain is located on the slope ranging between 11 and 60%. Slopes up to 10% occur only in the range of 9.6% (they represent a significant part of blowing sand, flooded valleys habitation, karst plains, high plateaus questions). The steepest inclinations, which are so vulnerable to erosion that they require a permanent forest cover, constitute only about 10%.

### 2.4 Forest extent – Povećanje šuma

The extent of forest land area and forest stand area has steadily increased since 1950. The reduction of forest land area extent in 2007 is just a normal fluctuation in the annual update of forest management plan data.

Apart of this extent of forest land area and forest stand area in Slovakia, there are parts of agricultural and other land areas with forest plants – called »white areas«.

**Table 1** Development of forest categories based on their purpose

**Tablica 1.** Prikaz površina šuma s obzirom na njihovu namjenu

Forests - Šume	Year - Godine					
	2000		2006		2007	
	ha	%	ha	%	ha	%
Commercial - <i>Gospodarske</i>	1 273 800	66.3	1 304 760	67.5	1 318 094	68.2
Protective - <i>Zaštitne</i>	306 700	16	328 526	17	329 530	17
Special purpose forests - <i>Šume posebne namjene</i>	340 900	17.7	298 763	15.5	285 318	14.8
Total - <i>Ukupno</i>	1 921 400	100	1 932 049	100	1 932 942	100

Source: National Forest Centre – Zvolen, Forestry industry database SR

**Table 2** Representation of the area based on slope gradients

**Tablica 2.** Prikaz šumskih površina s obzirom na nagib terena

Slope - <i>Nagib</i> , %	0 - 10	11 - 20	21 - 30	31 - 40	41 - 50	51 - 60	61 - 70	71 - 80
Area - <i>Površina</i> , ha	189 000	210 000	350 000	410 000	350 000	220 000	125 000	65 000

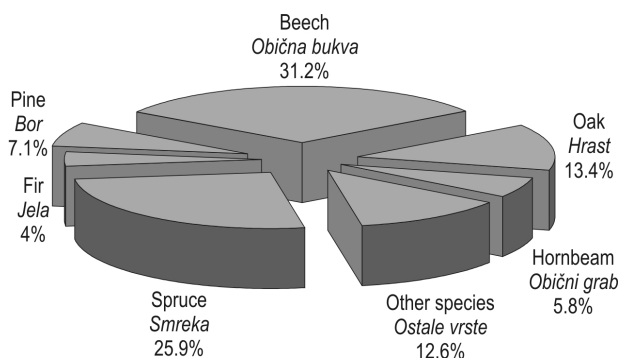
Source: National Forest Centre – Zvolen

**Table 3** Development of forest land area and forest stand area

**Tablica 3.** Razvoj šuma i šumskih zemljišta

Type - <i>Vrsta</i>	Year - <i>Godine</i>			
	1990	2000	2006	2007
Forest land area - <i>Površina šumskih zemljišta</i> , ha	1 976 538	1 997 961	2 007 006	2 006 601
Forest stand area - <i>Površina šuma</i> , ha	1 921 705	1 921 414	1 932 049	1 932 942
Forest land area used for timber production <i>Površine šumskih zemljišta korištenih za proizvodnju drva</i>			1 757 520	1 766 668

Source: National Forest Centre – Zvolen



**Fig. 2** Composition of tree species  
**Slika 2.** Udio pojedinih vrsta drveća

### 2.5 Tree species characteristic of Slovak forests – Udio pojedinih vrsta drveća u slovačkim šumama

Slovak forests consist of different tree species with the highest share of beech (31.2%), spruce (25.9%) and oak (13.4%). The share of trees in the forests follows quite closely the territory macrorelief. The plains (lowland) and hilly areas of the Southern and Eastern Slovakia have been occupied by broadleaved species and in the mountains of the Central and Northern Slovakia, mixed forests (stands) dominate with conifers prevailing.

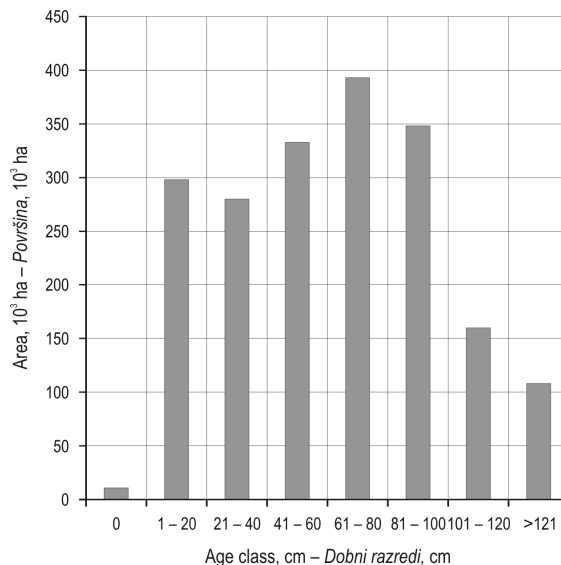
Table 4 shows a gradual reduction in the presence of conifers, including less resistant spruce, and vice versa, on increase in the presence of deciduous (broadleaved) trees. In terms of stability of forests, it can be evaluated positively.

The average age of all major tree species in Slovakia increases annually, which is the result of the current heterogeneous age composition of forests.

**Table 4** Development of coniferous and broadleaved species

**Tablica 4.** Kretanje udjela četinjača i listača

Tree species - Vrste drveća	Godine - Year				
	1980	1990	2000	2006	2007
	%				
Conifers - Četinjače	42.5	42.3	41.9	40.8	40.5
Broadleaved - Listače	57.5	57.7	58.1	59.2	59.5
Spruce - Smreka	26.4	27.3	26.8	26.1	25.9
Fir - Jela	5.8	5	4.3	4	4
Pine - Bor	7.5	7	7.5	7.2	7.1
Beech - Obična bukva	29.5	29.8	30.3	31.2	31.2
Oak - Hrast	14.4	14.2	13.6	13.4	13.4
Hornbeam - Obični grab	5.7	5.6	5.7	5.7	5.8



**Fig. 3** Age structure of forests in Slovakia  
**Slika 3.** Dobna struktura slovačkih šuma

### 2.6 Logging process – Pridobivanje drva

#### 2.6.1 Felling – Sječa

Logging in 2007 reached 8 367 100 m<sup>3</sup>, which is about 9 900 m<sup>3</sup> more than in 2006. The share of incidental felling of the total production accounted for 56.2%, and of conifers for almost 80%.

In 2007, the state forestry organizations harvested a total of 4 660 000 m<sup>3</sup> (56%) of timber, 2 826 000 m<sup>3</sup> of conifers and 1 834 000 m<sup>3</sup> of broadleaved species. The non-state sector harvested a total of 3 706 000 m<sup>3</sup> (44%) of timber, 2 518 000 m<sup>3</sup> of conifers and 1 188 000 m<sup>3</sup> of broadleaved species.

#### 2.6.2 Timber transport (skidding and transportation) – Transport drva (privlačenje i daljinski transport)

In 2007, the volume of extracted timber was 8 030 000 m<sup>3</sup> in the forest management of the Slovak Republic. 5% of timber was extracted in the state forestry organizations of the Slovak Republic by their own means of transport, and 7% of timber in non-state forests.

In the state forestry organizations, the volume of timber skidding, by use of their own mechanization, was carried out by:

- ⇒ 4.9% universal wheeled tractors (UKT),
- ⇒ 0.4% animal power (horses),
- ⇒ 59% forest tractors (LKT),
- ⇒ 14.4% forwarders,
- ⇒ 21.3% forest cableways.

**Table 5** Development of timber harvesting**Tablica 5.** Pridobivanje drva

Felling volume statistics, m <sup>3</sup> Etat, m <sup>3</sup>		Year - Godina		
		2005	2006	2007
Conifers Četinjače	Total - Ukupno	6 927 400	5 150 000	5 344 200
	Incidental - Sanitar	6 152 700	3 831 000	4 271 800
Broad-leaved Listače	Total - Ukupno	3 263 100	3 207 200	3 022 900
	Incidental - Sanitar	380 300	435 000	429 000
Total Ukupno	Total - Ukupno	10 190 500	8 357 200	8 367 100
	Incidental - Sanitar	6 533 000	4 266 000	4 700 800

Source: National Forest Centre - Zvolen

Compared to 2006, the share of timber extraction by forestry cableways increased by 19%. State forestry organizations logged 45.3% of timber in full lengths and the non-state forests the volume of 25.1%. The difference between the volume of skidded and logged timber (1 286 000 m<sup>3</sup>) is represented by the stock on hauling sites and warehouses and the timber sold on the spot and logged by vehicles of the customers. Recently, the main emphasis is given to the use of environmentally friendly machines and technologies and to the reduction of damages to natural environment by timber felling and logging. It is

**Fig. 4** LKT 120 T-H, special forestry machines, intentionally designed for tree cutting, branching and bucking to the desired length

**Slika 4.** LKT 120 T-H, specijalni stroj za šumarstvo, posebno dizajniran za rušenje stabala, kresanje grana i prikrajanje debla na željenu dužinu

necessary to create conditions for using environmentally friendly technologies (Tuček, Suchomel 2003).

### 2.6.3 Area opening up by forest road network – Otvorenost mrežom šumskih prometnica

The basic prerequisite for timber logging in the forest and the optimal management of forests can be

**Table 6** Volume of harvested timber depending on type of forest management**Tablica 6.** Etat drva ovisno o tipu gospodarenja

Forests Šume	Tree species Vrste drveća	Felling volume statistics of raw wood without bark - Etat drva bez kore, m <sup>3</sup>						
		Incidental felling Izvanredne sječe	Regeneration felling - Oplodne sječe			Thinnings - Prorede		
			Actual Redoviti	Incidental Slučajni	Incidental, % Slučajni, %	Actual Redoviti	Incidental Slučajni	Incidental, % Slučajni, %
State Državne	Coniferous Četinjače	31 000	2 149 000	1 766 300	82.2	646 100	490 900	76
	Broadleaved Listače	9 500	1 351 000	172 800	12.8	474 000	70 700	14.9
	Total - Ukupno	40 500	3 500 000	1 939 100	55.4	1 120 100	561 500	50.1
Non-state Privatne	Coniferous Četinjače	6 600	2 007 800	1 600 400	79.7	503 600	414 300	82.3
	Broadleaved Listače	2 200	877 000	117 900	13.4	309 200	67 600	21.9
	Total - Ukupno	8 800	2 885 000	1 718 300	59.6	812 800	481 800	59.3
Total Ukupno	Coniferous Četinjače	37 600	4 156 800	3 366 600	81	1 149 800	905 100	78.7
	Broadleaved Listače	11 700	2 228 100	290 700	13	783 100	138 200	17.7
	Total - Ukupno	49 300	6 384 900	3 657 400	57.3	1 932 900	1 043 300	54

Source: National Forest Centre - Zvolen

achieved by planning the construction of the most appropriate forest road network. The opening up of forests is understood as the optimal localization of forest road routes, ground and air communications and transportation routes with their rational structure built in the forest road network. This is achieved when the length of built roads and their area is as small as possible, while it reaches the highest percentage of area opening up and the optimal skidding distance using the newest technologies of timber logging (Žáček, Klč 2008). An insufficient density and poor quality of forest road network lead to growing distances for timber skidding from the felling site to the hauling site. For these reasons the stem method of felling and tractor skidding of timber to the hauling site prevails. This limits the possibilities for the effective use of multi-functional harvesting machinery, forest cableways and other opportunities for timber handling. High share of incidental timber felling, mainly caused by windstorm and other abiotic injurious factors, also has an important impact on the application of felling technology and



**Fig. 5** Increasing trend of timber extraction provided by private contractors

**Slika 5.** Daljinski transport drva u izvođenju privatnih poduzetnika

timber skidding. In 2007, the average density of forest road network in Slovakia reached 18.6 m/ha. Compared to 2006, the total length of forest roads managed by the State forests totally increased by 16 km, 2 km of category 1L roads and 14 km of 3L

**Table 7** Development of timber skidding

**Tablica 7.** Privlačenje drva

Legal entity - Pravni subjekt	Year - Godina, m <sup>3</sup>				
	2000	2005	2006	2007	
State Državne	Forced by the MP SR <i>U nadležnosti ministarstva poljoprivrede</i>	3 509 000	5 889 000	4 289 000	4 377 000
	Outside the force of MP SR <i>Izvan nadležnosti ministarstva poljoprivrede</i>	345 000	397 000	358 000	379 000
	Total - Ukupno	3 854 000	6 286 000	4 647 000	4 756 000
Non-state Privatne		Unknown <i>Nepoznato</i>	3 019 000	3 362 000	3 274 000
Total - Ukupno	3 854 000	9 305 000	8 009 000	8 030 000	

Source: Statistical reports MP SR

**Table 8** Development of wood logging

**Tablica 8.** Daljinski transport drva

Legal entity - Pravni subjekt		Year - Godine, m <sup>3</sup>			
		2000	2005	2006	2007
State Državne	Forced by the MP SR <i>U nadležnosti ministarstva poljoprivrede</i>	3 167 000	6 278 000	3 763 000	3 961 000
	Outside the force of MP SR <i>Izvan nadležnosti ministarstva poljoprivrede</i>	345 000	490 000	314 000	261 000
	Total - Ukupno	3 512 000	6 768 000	4 077 000	4 222 000
Non-state Privatne		Unknown <i>Nepoznato</i>	2 519 000	2 805 000	2 522 000
Total - Ukupno	3 512 000	9 287 000	6 882 000	6 744 000	

Source: Statistical reports MP SR

**Table 9** Structure of forest road network**Tablica 9.** *Struktura mreže šumskih prometnica*

Road network passing through forest <i>Mreža šumskih prometnica koja prolazi kroz šumu</i>		Year - Godina		Year - Godina	
		2006		2007	
		Length, km <i>Duljina, km</i>	Density, m/ha <i>Gustoća, m/ha</i>	Length, km <i>Duljina, km</i>	Density, m/ha <i>Gustoća, m/ha</i>
Managed by State forests, state enterprise <i>U nadležnosti državnih šuma, državnoga poduzeća</i>	Hauling forest roads of 1L class (with roadway) <i>Šumske ceste prvoga razreda (s kolničkom konstrukcijom)</i>	6354	3.2	6356	3.2
	Hauling forest roads of 2L class (locally paved) <i>Šumske ceste prvoga razreda (kolnička konstrukcija izvedena od lokalnoga materijala)</i>	14 842	7.4	14 842	7.4
	Earth roads of 3L class + permanent skidding roads <i>Traktorski putovi + traktorske vlake</i>	15 894	7.9	15 908	8
	Together - <i>Zajedno</i>	37 090	18.5	37 106	18.6
Managed by different owners <i>U nadležnosti ostalih vlasnika</i>	Hauling roads of 1L character <i>Ceste prvoga razreda</i>	3212	1.6	3212	1.6
Together (Roads managed by State forests and by different owners) <i>Zajedno (ceste u nadležnosti državnih šuma i ostalih vlasnika)</i>		40 302	20.1	40 318	20.2

Source: National Forest Centre - Zvolen

category roads, natural roads. According to Dvorščák and Böhmer (2007) a sufficiently dense and high-quality network of forest roads is essential for providing an environmentally friendly forest management and for an adequate fire protection.

## 2.7 Ownership and management of forests – *Vlasništvo i upravljanje*

The structure of ownership and management of forests in Slovakia in 2007 is listed in Table 11. This

table has been compiled from the register of forest owners and users. 55.5% of the total forest area is in the use of state entities, while the state owns 41.4%.

The highest share of forests is privately owned. The reason lies in the fact that it is mostly the forest land area made of small individual ownership and shared coparcenary, which cannot be identified in the field (terrain). There are also forest land owners, who never claimed the return of their property for various reasons.

**Table 10** Structure of forest stand area according to its ownership and use in 2007**Tablica 10.** *Struktura šuma prema vlasničkom odnosu i upotrebi (zakupu) u 2007*

Type of ownership - Tipovi vlasništva							
Category <i>Kategorija</i>	State <i>Državne</i>	Municipal <i>Općinske</i>	Private <i>Privatne</i>	Communities <i>U vlasništvu zajednica</i>	Church <i>Crkvene</i>	Agricultural <i>U vlasništvu poljoprivrednih gospodarstava</i>	Unknown owners <i>Nepoznati vlasnici</i>
Forest land area - Površine šumskih zemljišta, ha/%							
Ownership <i>Šume u vlasništvu</i>	799 067	189 875	275 164	493 261	62 313	4195	109 067
%	41.4	9.8	14.3	25.5	3.2	0.2	5.6
Tenure <i>Šume u zakupu</i>	1 072 765	171 639	139 824	502 677	40 810	5227	-
%	55.5	8.9	7.2	26	2.1	0.3	-

Source: National Forest Centre - Zvolen

## 2.8 Forest management and relevant business entities – *Uprava i subjekti uključeni u gospodarenje šumama*

### 2.8.1 State forests – *Državne šume*

Forests owned by state are managed by the state organizations of forest management:

- ⇒ Forests of the Slovak Republic, state enterprise,
- ⇒ Lesopoľnohospodársky podnik Ulič, sp (LPM),
- ⇒ High Tatras Mts. National Park, State forests (SL TANAP),

These three organizations fall under the Ministry of Agriculture of the Slovak Republic.

- ⇒ Military Forests and Estates of the Slovak Republic, state enterprise, Pliešovce (VLM), which fall within the competence of the Slovak Ministry of Defense.

The state organizations of forest management also manage the forests of owners who, due to various reasons, failed to transpose them, as well as forests leased from the non-state entities. For the practical training of students, the Forests of SR, state enterprise, leased based on a contract the forest land areas for the following schools: Secondary Forestry School (SLS) in Banská Štiavnica, Secondary Forestry School in Prešov, Secondary Forestry School in Liptovský Hrádok and Technical University (TU) in Zvolen.

### 2.8.2 Non-state forests – *Privatne šume*

Non-state forests are represented by: private, community, church, agricultural cooperative and municipal forests.

It is practically impossible to state objectively that the state entities manage the forests better than

**Table 11** Basic data on forests managed by the state organizations

**Tablica 11.** Osnovni podaci o upravljanju šumama koje su u državnom vlasništvu

Index - Indeks	State organizations - Organizacija državnih šuma					
	Forests SR Šume u vlasništvu »Slovačkih šuma«	ŠL TANAP Šume nacionalnoga parka Visoke Tatre	LPM Ulič Šume u vlasništvu poljoprivrednih gospodarstva	VLM SR Šume u vlasništvu vojske	SLŠ, TU Fakultetske šume	Total Ukupno
Forest land area, ha Površina šumskoga zemljišta, ha	932 956	38 855	20 789	68 081	12 085	1 072 766
Timber volume, m <sup>3</sup> Drvni obujam, m <sup>3</sup>	217 345 000	6 084 000	4 132 000	14 765 000	3 225 000	245 551 000
Area of mature forests, ha Površina zrelih šuma, ha	165 225	3570	2345	14 762	2806	188 708
Timber volume of mature forests, m <sup>3</sup> Drvni obujam u zrelih šumama, m <sup>3</sup>	65 559 000	1 316 000	875 000	5 017 000	1 345 000	74 112 000

Source: National Forest Centre - Zvolen

**Table 12** Basic data on forests in the use of non-state entities

**Tablica 12.** Osnovni podaci o upravljanju šumama koje su u privatnom vlasništvu

Index - Indeks	Type of ownership - Vrsta vlasništva					
	Private Privatne	Community U vlasništvu zajednica	Church Crkvene	Agricultural U vlasništvu poljoprivrednih gospodarstava	Municipal Općinske	Total Ukupno
Forest land area, ha Površina šumskoga zemljišta, ha	139 824	502 677	40 810	5227	171 639	860 177
Timber volume, m <sup>3</sup> Drvni obujam, m <sup>3</sup>	34 588 000	112 161 000	9 823 000	1 104 000	42 637 000	200 313 000
Area of mature forests, ha Površina zrelih šuma, ha	29 029	85 722	7276	1258	32 755	156 040
Timber volume of mature forests, m <sup>3</sup> Drvni obujam u zrelih šumama, m <sup>3</sup>	11 560 000	32 531 000	2 756 000	409 000	13 869 000	61 125 000

Source: National Forest Centre - Zvolen

non-state entities and vice versa. However, it is undisputed that the state forest entities against the non-state entities are major organizational units with greater potential of people with forestry education, which provides better flow of information necessary for forestry practice. An indisputable advantage of non-state forestry entities is the sense of responsibility, which lies in the fact that the owner is working for himself – in order to enhance his property.

### 3. Conclusion – *Zaključak*

In 2007, the extent of forest land area reached 2 006 600 ha and forest stand area 1 932 900 ha. Forests covered the area of approximately 41% (percentage share of the total forest land area from the total area of Slovakia) in that year. Slovak forests consist of different tree species with the highest share of beech (31.2%), spruce (25.9%) and oak (13.4%). Broad-leaved stands occupy about 50%, coniferous stands 31% and mixed stands 19%. The growing stock in forest stands is increasing and it reached 445 900 000 m<sup>3</sup> of raw wood without bark in 2007. The average growing stock is about 232 m<sup>3</sup>/ha (Green Report 2008). Also, the felling has a growing trend. In 2007, it reached 8 367 000 m<sup>3</sup>, which represents the second highest annual volume in timber felling in the entire history of the Slovak forestry. In 2005, the timber felling was 10 200 000 m<sup>3</sup>. It was a result of timber processing coming from the area damaged by windstorm in November 2004. The windstorm disturbed the forests on the area of 330 000 ha. The total volume of broken and fallen trees is represented by timber volume of 4 700 000 m<sup>3</sup> (Suchomel et al. 2004). According to the current age structure of forests and its probable development, the total volume of timber felling is expected to increase. The current volume of timber felling is more than bearable due to large-scale random felling every year. This excess has reached 16.7% in average since 2000 and in recent years (2005 to 2007) it exceeded 27.8%. Increasing of felling leads to the growing of income and economic potential of forest management, and however the excess of planned volume reduces the future felling

possibilities. High rate of incidental felling is also caused by unsatisfactory health conditions of forests, caused by high air pollution, which leads to subsequent reduction of forest resistance, mainly in coniferous stands with prevalence of spruce. The sale of timber is the most important source of revenues in the forestry sector, assuring approximately 79% of income and profit in forestry. In 2007, more than 1 500 000 m<sup>3</sup> of timber was exported (Green Report 2008).

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## Sažetak

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### Stanje i pregled gospodarenja šumama u Slovačkoj

*U 2007. godini površina šumskoga zemljišta dosegla je 2 006 600 ha, a površina šuma 1 932 900 ha. Šumovitost Republike Slovačke iznosi 41 % (postotni udio površine šumskoga zemljišta u ukupnoj površini Slovačke). Šume imaju raznolik sastav drvenastih vrsta (mješovitu strukturu) s najvišim udjelom bukve (31,2 %),*



smreke (25,9 %) i hrasta (13,4 %). Od ukupne površine šuma listopadne šume dolaze na 50 %, šume četinjača na 31 %, dok mješovite šume dolaze na 19 % površine.

Drona je zaliha u porastu i u 2007. godini dosegla je 445 900 000 m<sup>3</sup> (iskazana bez kore). Prosječna drvena zaliha po hektaru iznosi 232 m<sup>3</sup>/ha (Green report 2008). Sječa također pokazuje porast i u 2007. je dosegla 8 367 000 m<sup>3</sup>, što predstavlja drugi najviši godišnji sječivi etat u povijesti slovačkoga šumarstva. Najveći godišnji etat zabilježen je 2005, a iznosio je 10 200 000 m<sup>3</sup>. Nastao je kao rezultat vjetroloma katastrofalnih razmjera koji je pogodio područje nacionalnoga parka Visoke Tatre 2004. godine na površini od 330 000 ha. Ukupni obujam izvaljenih i slomljenih stabala iznosio je 4 700 000 m<sup>3</sup> (Suchomel i dr. 2004).

Prema trenutačnoj dobnoj strukturi šuma očekuje se da će ukupni obujam etata nastaviti rasti. Trenutačni godišnji sječivi etat veći je od planiranoga zbog velikih slučajnih prihoda. Od 2000. do danas on je veći za 16,7 %, dok je gledano u razdoblju od 2005. do 2007. on veći za 27,8 %. Povećanjem godišnjega sječivoga etata raste prihod u gospodarenju šumama, ali će njegov višak, zbog velikih slučajnih prihoda, utjecati na smanjenje etata u budućnosti. Visok udio slučajnih sječa te sve veće onečišćenje zraka uzrokuju vrlo loše zdravstveno stanje šuma, što u konačnici smanjuje otpornost na različite biotske štetnike, ponajprije crnogoričnih šuma u čijem sastavu prevladava smreka. Prodaja drva najvažniji je izvor dobiti u šumarstvu od kojega se osigura oko 79 % svih prihoda. U 2007. bilo je izvezeno više od 1 500 000 m<sup>3</sup> drva (Green report 2008).

Ključne riječi: šuma, gospodarenje šumom, etat, drvena zaliha