

## Gross felling volume

	State forests	Non-state forests	Total
<b>By felling types</b>	1 000 gross m <sup>3</sup>		
Cleaning	166	128	294
Pre-commercial thinning	423	356	779
Commercial thinning	621	157	778
Final cutting	3 158	2 428	5 586
Selection cutting	43	2	45
Stock maintenance	0	9	9
Sanitary cutting	225	59	284
Other fellings	60	40	100
<b>Total</b>	<b>4 696</b>	<b>3 179</b>	<b>7 875</b>

<b>By tree species groups</b>	1 000 gross m <sup>3</sup>		
Oak	818	220	1 038
Turkey oak	751	186	937
Beech	565	105	670
Hornbeam	221	84	305
Black locust	604	1 141	1 745
Other hard broadleaved	184	69	253
Hybrid poplar	385	731	1 116
Native poplar	119	124	243
Other soft broadleaved	173	134	307
Coniferous	876	385	1 261
<b>Total</b>	<b>4 696</b>	<b>3 179</b>	<b>7 875</b>

Source: NFCSO Forestry Directorate, 2013

## Timber products

	total (1 000 net m <sup>3</sup> )	share in assortment composition (%)*
Logs for panel products	113	1.7
Sawlogs	1 058	15.7
Other raw material for sawmilling	498	7.4
Pitwood	3	0.1
Pulpwood	626	9.3
Bolt for panels	467	6.9
Other industrial wood	376	5.6
Technological chips	48	0.7
<b>Total industrial wood</b>	<b>3 189</b>	<b>47.4</b>
<b>Fuelwood</b>	<b>3 542</b>	<b>52.6</b>
<b>Total removals</b>	<b>6 731</b>	<b>100.0</b>

Source: NFCSO Forestry Directorate, 2013

\*Calculated on the basis of statistical sampling.

## Energy supply from wood

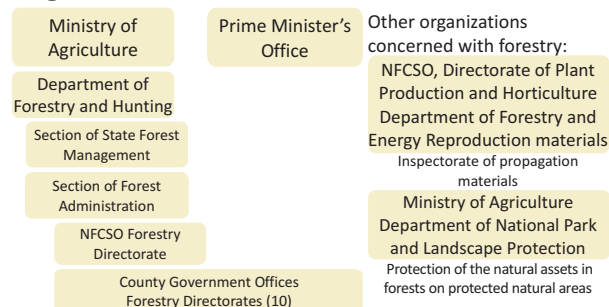
	Domestic stock	Imported stock
data of the year 2013		
Direct use of wood-based biomass for energy production (felling)	3.5 million m <sup>3</sup> woodfuel 5 000 t wood pellets 2 000 t briquett	78 000 m <sup>3</sup> woodfuel 15 000 t wood pellets
Indirect use of wood-based biomass (residues, secondary product)	65 000 m <sup>3</sup> residues	240 000 m <sup>3</sup> residues
Short-rotation energy plantations	3 398 m <sup>3</sup> Poplar and Willow	
<b>Total energy</b>	<b>656.3 ktoe*</b>	<b>89.5 ktoe*</b>

Source: NFCSO Forestry Directorate and Hungarian Central Statistical Office (HCSO), 2013  
Values calculated on the basis of statistical sampling.

\*ktoe = Kilotonne of Oil Equivalent

In 2013 the total amount of energy obtained from the direct and indirect use of wood-based biomass was nearly 750 ktoe. Approximately 12% of this amount stemmed from imported stocks. Ca. 7% of the total primary energy supply were of renewable sources. The wood based biomass made ca. 51% of it, of the total meaning 3.6%.

### Organisational structure - Forest administration



### Websites related to forestry:

Ministry of Agriculture -

[www.kormany.hu/hu/foldmuvelesugyi-minisztterium](http://www.kormany.hu/hu/foldmuvelesugyi-minisztterium)

NFCSO - Forestry Directorate - [www.nebih.gov.hu](http://www.nebih.gov.hu)

NARIC - Forest Research Institute (FRI) - [www.erti.hu](http://www.erti.hu)

University of West Hungary (UWH) - [www.nyne.hu](http://www.nyne.hu)

Hungarian Federation of Forestry and Wood Industries - [www.fagosz.hu](http://www.fagosz.hu)

Association of Hungarian Private Forest Owners - [www.megosz.org](http://www.megosz.org)

National Forestry Association - [www.oee.hu](http://www.oee.hu)

Forestpress - [www.forestpress.hu](http://www.forestpress.hu)

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# Forest resources and forest management



## in Hungary 2013

Budapest, 2014

National Food Chain Safety Office

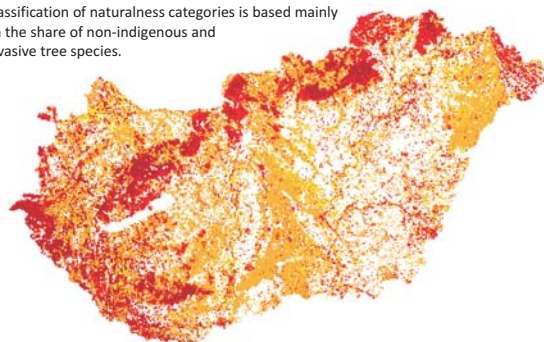
Forestry Directorate



## Naturalness and nature conservation

Naturalness categories of forests	area (ha)
Natural and close-to-nature forests	448 156
Semi-natural forests	576 046
Transferred forests	131 422
Semi-plantations	656 793
Plantations	125 722
<b>Total</b>	<b>1 938 139</b>

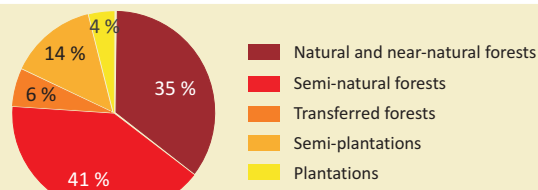
Classification of naturalness categories is based mainly on the share of non-indigenous and invasive tree species.



## Protected and Natura 2000 forests area (ha)

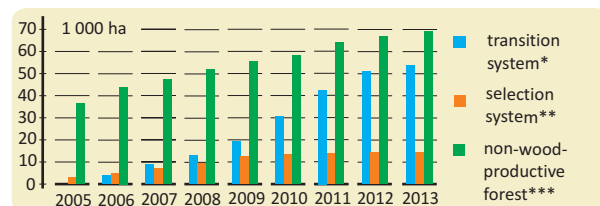
	Forest sub-compartment	Other type of subcomp.	Total
<b>Protected area</b>			
Strictly protected	66 882	5 946	72 828
Protected	356 146	25 390	381 536
Total	423 028	31 336	454 364
<b>Natura 2000 sites</b>			
Protected and strictly protected	384 251	28 520	412 771
Non-protected	387 080	33 507	420 587
Total	771 331	62 027	833 358
<b>Birds sites and habitats sites</b>			
Special Protection Area	467 042	31 747	498 789
Special Area of Conservation	627 894	54 712	682 606

## Naturalness of the Natura 2000 forests



Source: National Forestry Database, data of 1st Jan. 2014

## Close-to-nature forest management



Source: National Forestry Database, data of 1st Jan. 2014

\* The goal is to reach the selection system.

\*\* Individual trees or groups of trees are harvested periodically and frequently.

\*\*\* The aim is to let natural processes taking their course. Fellings are possible only for scientific, protection or regeneration purposes.

## Forestations (regeneration and afforestation)

### Achievements in the growing year 2012-2013 (ha)

	State forests	Non-state forests	Total
<b>Successful initial stand establishment</b>			
Regeneration after clear-cutting	8 243	10 353	18 596
<b>Initial planting</b>			
In first afforestation	136	2 394	2 530
<b>Replacement planting</b>			
In regeneration	3 790	1 085	4 875
In first afforestation	156	563	719
<b>Completed plantings</b>			
In regeneration, after clear-cutting	6 905	6 176	13 081
In regeneration, after shelterwood c.	1 756	150	1 906
In first afforestation	436	3 550	3 986
<b>Terms of completion</b>	(year)		
In regeneration, after clear-cutting	7.1	6.9	7.0
In regeneration, after shelterwood c.	14.9	17.8	15.2
In first afforestation	5.3	6.7	6.5

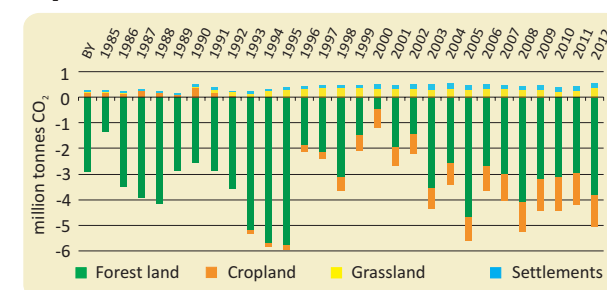
### Target stand types of forestations

	Successful initial planting in regenerations (ha)	Initial planting in first afforestation (ha)
Oak	2 064	915
Turkey oak, other hard broadleaved	780	86
Beech	43	0
Black locust	9 241	820
Hybrid poplar and white willow	2 574	195
Native poplar, other soft broadleaved	2 830	509
Coniferous	745	5
<b>Total</b>	<b>18 277</b>	<b>2 530</b>

Source: NFCSO Forestry Directorate, 2013

## The Kyoto Protocol and the forests

### CO<sub>2</sub> emission and removals in the LULUCF sector



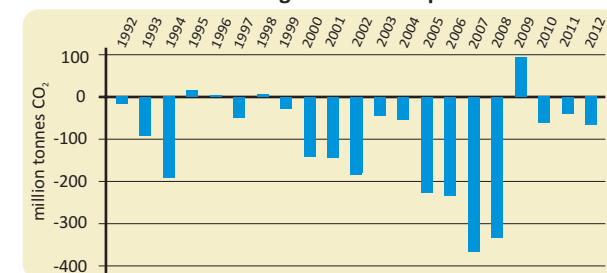
Source: NIR Hungary 2013, National Inventory Report for 1985-2012 Hungary, Hungarian Meteorological Service, 2013.

Forest management is the only major CO<sub>2</sub> sink in the GHG-balance sheet of the country.

### GHG emissions and removals in the forestry sector in 2012

Forest management activities (afforestation, regeneration and deforestation since 1990) under Article 3.3 of the KP represented a net sink of 1.25 million tonnes CO<sub>2</sub>, while the activity under Article 3.4, i.e. forest management (FM), was also a net sink of 1.70 million tonnes CO<sub>2</sub>. The most efficient carbon sequestration can be reached by first afforestation.

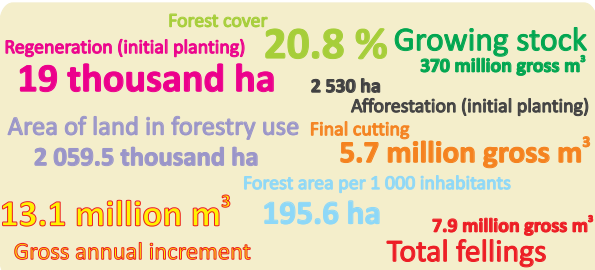
### Annual carbon stock change of the HWP pool



Source: Values calculated from the data of the NFCSO Forestry Directorate, the Hungarian Central Statistical Office (HCSO), and the research of Aladár Halász.

The second commitment period of the Kyoto Protocol starts in 2015, the rules of accounting of CO<sub>2</sub> emissions and removals are changing, and accounting for emissions and removals from the harvested wood product (HWP) pool is becoming mandatory. A model was set up to calculate the emissions and removals of this new carbon pool. The model estimates the carbon content of the semi-finished product commodities which originate from domestic harvest. For each product category specific half lives and density values are used. The estimated carbon accumulation of the Hungarian HWP pool amounts to 9 million tonnes of carbon, and the average of annual net emissions from the pool is around 100 000 tonnes of CO<sub>2</sub>.

General figures on forests



Source: Hungarian Central Statistical Office (HCSO) 2013; National Forestry Database, data of 1st Jan. 2014; NFCSO Forestry Directorate, 2013

The history of modern forestry in Hungary

1791

The Parliament enacted the first feudal act on forests.

1879

Enactment of the first modern forest act.

1920

After the World War I, Hungary lost 84% of its forests, and the forest cover decreased from 26% to 12%.

1935

The Act Nr. IV of 1935 on forest was according to the new conditions of the country, and also covered nature conversation.

1936

Hungary hosted the 2nd World Forestry Congress and the 9th Congress of IUFRO.

1945

Private forest holdings exceeding 58 hectares were nationalized, properties of 6 to 58 hectares were taken into state management.

1959

Forest owner associations were cut back; about 30% of the total forests were assigned to agricultural cooperatives.

1961

Enactment of the Act Nr. VII of 1961 on forests and wildlife mangement based on socialist terms.

1996

As a result of the political system change in 1989, about 40% of the forests were privatised. The legislative control for multiple-use and sustainable forestry regulated by the Act Nr. LIV of 1996 on forests and protection of forests.

One main aim of the Act Nr. XXXVII of 2009 is to drive forests closer to their natural conditions. On one hand, the act defines ‘quantitative naturalness’ and prescribes that it may not decrease due to management activities. On the other hand, the act precibes the use of continuous cover forestry methods on a predetermined area of state-owned forests. Further, it enables NGOs’ contribution in forest management planning.

- Main objectives
- ensure long-term environmental, economic and social services of forests by sustainable multi-purpose forest management.
  - harmonize the interest of the society in sustainable forest management with the interests of forest owners.
  - increase the forest area by afforestation up to 26-27% of the land area.
  - maintain natural or close-to-nature forest stands composed by indigenous tree species and extend their area in accordance with prevailing site conditions.

Data on forest land

	1 000 ha	share (%)
Forest land (covered by tree stands or earmarked for regeneration)	1 938.1	20.8 %
Other land in forestry use (nurseries, rides, permanent clearings, roads)	121.4	1.3 %
Total area of forestry use	2 059.5	22.1 %

Source: National Forestry Database, data of 1st Jan. 2014

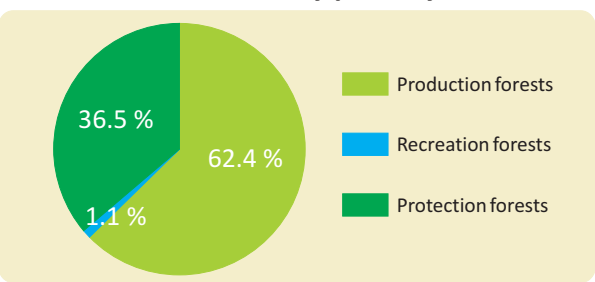
Forest land area and ownership categories

County	Area (km <sup>2</sup> )	Forest l. area (km <sup>2</sup> )	Forest ratio (%)	In forestry use (km <sup>2</sup> )	State (%)	Com-munal (%)	Private (%)	Mixed (%)*
Pest incl. Budapest	6 918	1 705	24.6	1 800	60.8	2.4	35.6	1.2
Fejér	4 359	543	12.5	606	75.2	2.8	21.2	0.8
Komárom-Esztergom	2 265	620	27.4	663	81.0	1.0	17.6	0.4
Veszprém	4 493	1 348	30.0	1 542	65.6	0.4	33.2	0.8
Győr-Moson-Sopron	4 208	809	19.2	895	71.0	0.6	28.3	0.1
Vas	3 336	941	28.2	986	51.4	0.4	48.2	0.0
Zala	3 784	1 196	31.6	1 261	52.7	0.6	41.8	4.9
Baranya	4 429	1 115	25.2	1 167	54.8	1.4	42.1	1.7
Somogy	6 036	1 790	29.6	1 910	56.5	0.8	41.5	1.2
Tolna	3 704	662	17.9	708	57.6	0.5	41.1	0.8
Borsod-Abaúj-Zemplén	7 250	2 091	28.8	2 174	60.0	1.3	37.9	0.8
Heves	3 637	885	24.3	915	59.8	0.3	39.6	0.3
Nógrád	2 545	993	39.0	1 029	55.4	0.2	44.1	0.3
Hajdú-Bihar	6 210	699	11.3	741	46.9	0.6	51.9	0.6
Jász-Nagykun-Szolnok	5 582	327	5.9	354	45.6	2.8	51.0	0.6
Szabolcs-Szatmár-Bereg	5 937	1 252	21.1	1 296	27.1	1.2	71.3	0.4
Bács-Kiskun	8 444	1 767	20.9	1 867	47.3	0.7	50.3	1.7
Békés	5 630	260	4.6	283	62.3	3.7	32.2	1.8
Csongrád	4 263	378	8.9	398	49.3	1.5	49.0	0.2
Total	93030	19381	20.8	20595	55.7	1.2	42.0	1.1

Source: National Forestry Database, data of 1st Jan. 2014

\*Areas having state, private and community property plots.

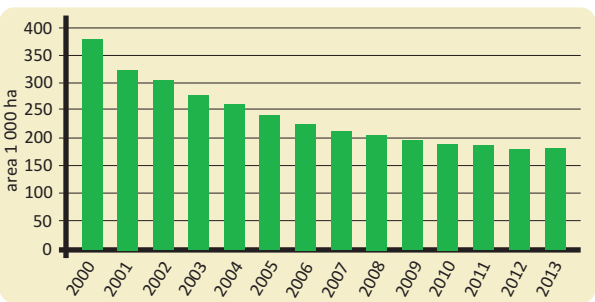
Distribution of forests by primary function



Source: National Forestry Database, date of 1st Jan. 2014

Protection forests include protective forests (soil, water, settlement protection, etc.) and protected forests (i.e. in protected natural areas). Their share has been increasing for decades.

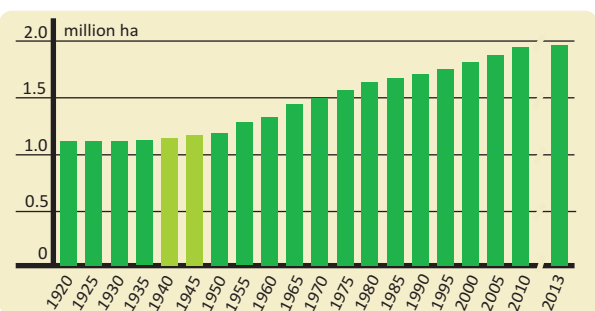
Forest area with no forest management



Source: National Forestry Database, date of 1st Jan. 2014

In the past decade the forest administration tried to decrease the area of forest with no management, which was created by the privatization of former state ownership. As a result, the area decreased by 52% by now, compared to 2000.

Changes of the forest area (1920-2013)



Source: National Forestry Database, 2013.

Data of 1940 and 1945 are missing. The light green clounms show estimated data.

The share of the forest area between 1920 and 2010 increased from 11.8% to 20.7%, due to the afforestation programs subsidized by the state. After the transition of the political system in 1989 mainly private forest owners made first afforestations.

First afforestation - initial plantings (ha)

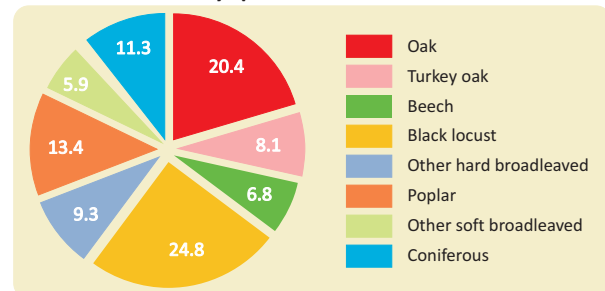
Growing year	State forests	Non-state forests	Total
2005-2006	770	13 219	13 989
2006-2007	512	18 436	18 948
2007-2008	391	6 941	7 332
2008-2009	791	4 377	5 168
2009-2010	1 084	4 012	5 096
2010-2011	143	2 660	2 803
2011-2012	516	4 021	4 537
2012-2013	136	2 394	2 530

Source: NFCSO Forestry Directorate, 2013



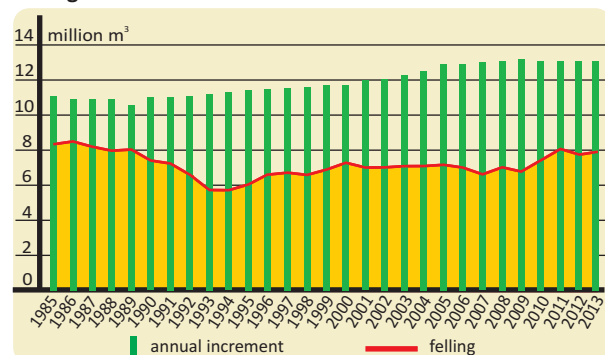
## Annual increment, fellings and growing stock

### Current increment by species

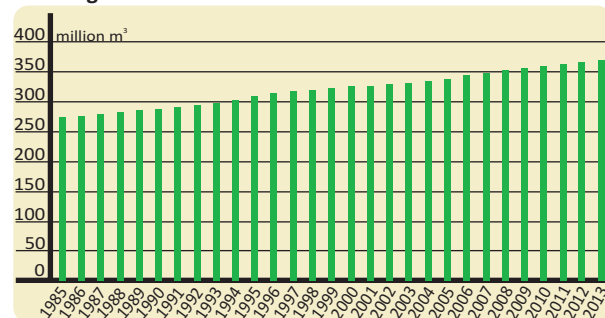


The gross annual increment is **13.1 million gross m³/year**. It is **0.414 gross m³ per sec**, equal to the volume of a cube of 74.6 cm ledge.

### Felling and annual increment



### Growing stock

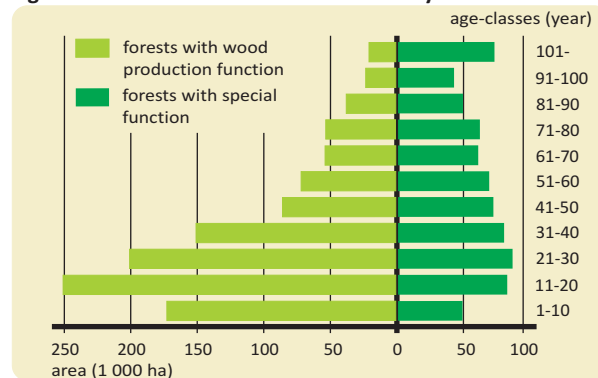


Source: NFCSO Forestry Directorate, 2013; National Forestry Database, data of 1st Jan. 2014

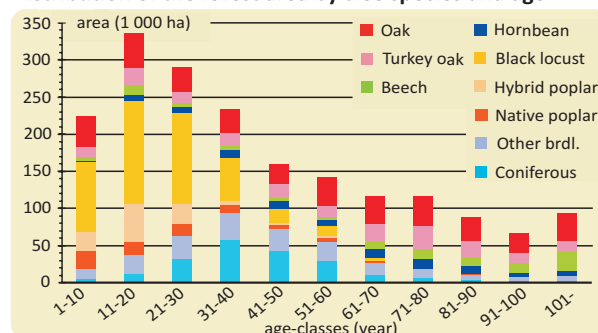
The growing stock has been steadily increasing since the annual increment has been in each year higher than the volume of felling and mortality.

## Tree species and age-class distribution

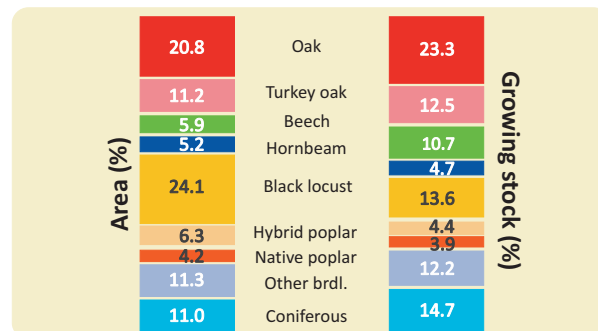
### Age-class distribution of the forest area by function



### Distribution of the forest area by tree species and age



### Tree species distribution of the forest area and the growing stock

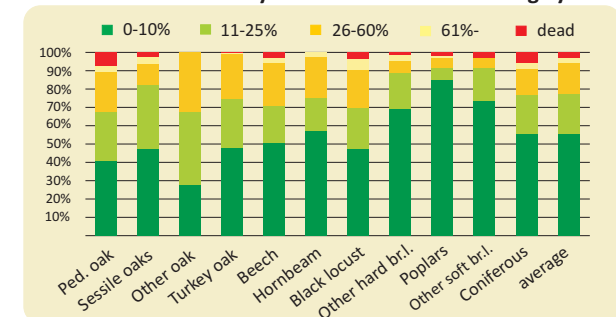


Source: National Forestry Database, data of 1st Jan. 2014

63% of the forest area is covered by indigenous species and 37% by alien or naturalized ones (Black locust, Red oak, coniferous), or improved species (Hybrid poplar).

## Forest health condition

### Defoliation measured by the ICP Forests Monitoring System

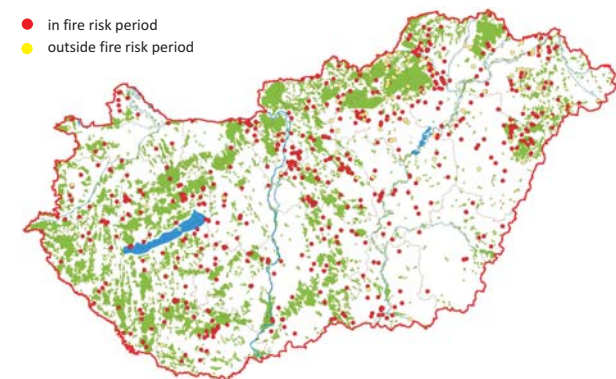


Source: NFCSO Forest Health Condition Database, data of 1st Jan. 2014

Forest health condition is still good. In the year 2013 there was a slight deterioration in respect of defoliation. The average defoliation was 18.7%, which is higher than in 2012 (17.9%). The Poplars and "Other soft broadleaved" species were in best conditions. In these cases the proportion of asymptomatic trees exceeded 70%. The worst health condition was shown by the Oaks, Black locust and Beech. Turkey Oak is interesting, while this category has low share of asymptomatic and hardly damaged trees either, so the average level of defoliation is 16.2%.

## Forest fires

● in fire risk period  
● outside fire risk period



761 forest fires were reported in 2013 with a total burnt area of 1 955 ha. The number of fires and the total burnt area were smaller compared to previous two years. This is due climate extremities or agricultural and forest management methods. The most affected regions were northern Hungary close to agricultural areas and the Great Plain in mid of country, in which more than 40% of forest fires occurred. Map shows places of forest fires in Hungary.

Source: NFCSO Forestry Directorate, Forest Fire Information System 2013

National Food Chain Safety Office

Forestry Directorate

