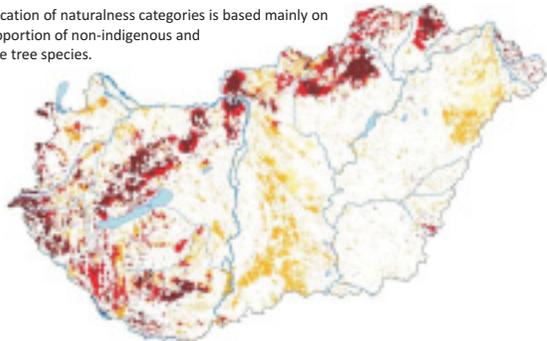


Naturalness and nature conservation

| Naturalness categories of forests | area (ha) |
|--------------------------------------|----------------|
| Natural and close to natural forests | 462112 |
| Semi-natural forests | 561819 |
| Transferred forests | 126481 |
| Semi-plantations | 655780 |
| Plantations | 127412 |
| Total | 1933604 |

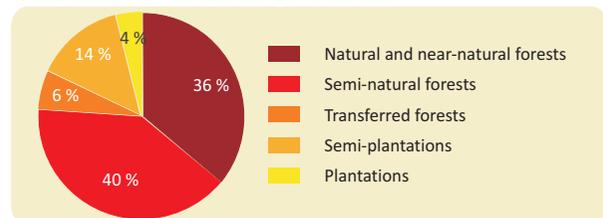
Classification of naturalness categories is based mainly on the proportion of non-indigenous and invasive tree species.



Protected and Natura 2000 forests - area in hectares

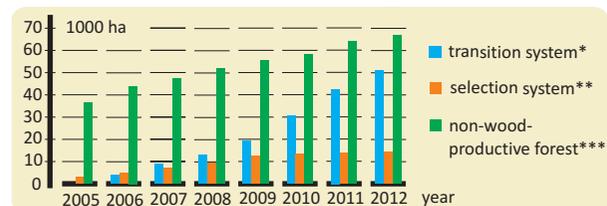
| | Forest sub-compartment | Other type of subcomp. | Total |
|---------------------------------------|------------------------|------------------------|---------------|
| Protected area | | | |
| Strictly protected | 66148 | 5977 | 72125 |
| Protected | 356303 | 25396 | 381699 |
| Total | 422451 | 31373 | 453824 |
| Natura 2000 sites | | | |
| Protected and strictly protected | 383831 | 28479 | 412310 |
| Non-protected | 386642 | 33899 | 420541 |
| Total | 770473 | 62378 | 832851 |
| Birds sites and habitats sites | | | |
| Special Protection Area | 466500 | 31932 | 498432 |
| Special Area of Conservation | 627261 | 55084 | 682345 |

Naturalness of the Natura 2000 forests



Source: National Forestry Database, data of 1st Jan. 2013

Close-to-nature forest management



* The goal is to reach the selection system.

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

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

Source: National Forestry Database, data of 1st Jan. 2013

Forestation (regeneration and afforestation)

Growing year 2011-2012, area in hectares

| | State forests | Non-state forests | Total |
|---|---------------|-------------------|-------|
| Successful initial stand establishment | | | |
| Regeneration after clear-cutting | 6793 | 7972 | 14765 |
| Initial planting | | | |
| In afforestation | 516 | 4021 | 4537 |
| Replacement planting | | | |
| In regeneration | 3050 | 786 | 3836 |
| In afforestation | 77 | 395 | 472 |
| Completed plantings | | | |
| In regeneration, after clear-cutting | 6298 | 4 892 | 11190 |
| In regeneration, after shelterwood c. | 1925 | 260 | 2185 |
| In afforestation | 342 | 4823 | 5165 |
| Terms of completion | (year) | | |
| In regeneration, after clear-cutting | 7.2 | 6.7 | 7.0 |
| In regeneration, after shelterwood c. | 15.2 | 13.6 | 15.0 |
| In afforestation | 5.0 | 6.3 | 6.2 |

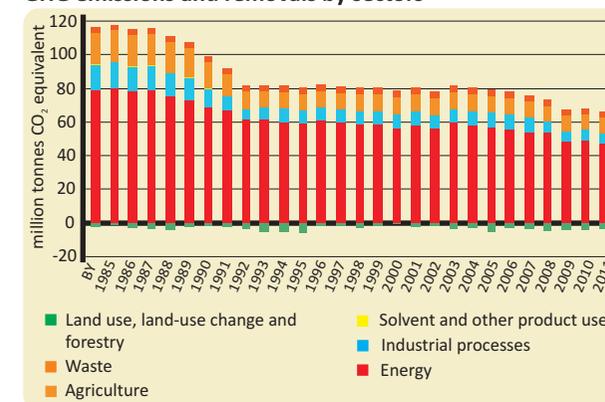
Target stand types of forestations

| | Successful initial stand establishment (ha) | Initial planting in afforestation (ha) |
|------------------------------------|---|--|
| Oak | 1864 | 2343 |
| Turkey oak, other hard broadleaved | 603 | 147 |
| Beech | 58 | 2 |
| Black locust | 7609 | 1011 |
| Hybrid poplar and white willow | 2016 | 172 |
| Native poplar, other soft broadl. | 2236 | 855 |
| Coniferous | 379 | 7 |
| Total | 14765 | 4537 |

Source: NFCSO "Report on Forestations and Fellings in 2012"

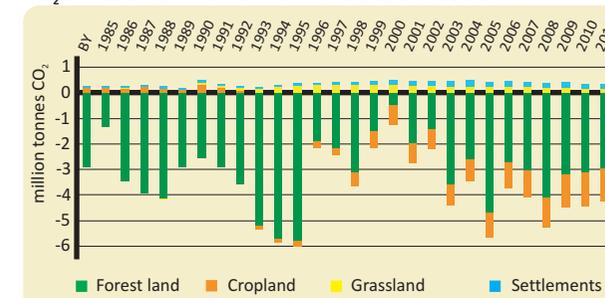
The Kyoto Protocol and the forests

GHG emissions and removals by sectors



By ratifying the Kyoto Protocol (KP, 1997), Hungary committed to reducing its GHG emissions by 6% compared to the base year (BY - the average of 1985-87). The country's emission reductions are mainly due to the decrease of the emissions in the energy, industry and agriculture sectors. Actual removals are produced only by the land use, land-use change and forestry (LULUCF) sector. (The positive values mean emission and negative values mean removal.)

CO₂ emission and removals in the LULUCF sector



Forest management is the only major CO₂ sink in the GHG-balance sheet of the country

GHG emissions and removals in the forestry sector in 2011

Forest management activities (afforestation, reforestation and deforestation since 1990) under Article 3.3 of the KP represented a net sink of 1.25 million tonnes CO₂, while the activity under Article 3.4, i.e. forest management (FM), was also a net sink of 1.70 million tonnes CO₂. The most efficient carbon sequestration can be reached by afforestation.

Source: NIR Hungary 2013, National Inventory Report for 1985-2011 Hungary, Hungarian Meteorological Service

Annual gross felling volume in 2012

| | State forests | Non-state forests | Total |
|-------------------------|---------------------------|-------------------|-------------|
| By felling types | 1000 gross m ³ | | |
| Cleaning | 168 | 126 | 294 |
| Pre-commercial thinning | 423 | 377 | 800 |
| Commercial thinning | 603 | 159 | 762 |
| Final cutting | 3022 | 2530 | 5552 |
| Selection cutting | 47 | 2 | 49 |
| Stock maintenance | 2 | 8 | 10 |
| Sanitary cutting | 124 | 49 | 173 |
| Other fellings | 62 | 30 | 92 |
| Total | 4451 | 3281 | 7732 |

| By tree species groups | 1000 gross m ³ | | |
|-------------------------------|---------------------------|-------------|-------------|
| Oak | 831 | 224 | 1055 |
| Turkey oak | 704 | 175 | 879 |
| Beech | 582 | 116 | 698 |
| Hornbeam | 220 | 86 | 306 |
| Black locust | 555 | 1238 | 1793 |
| Other hard broadleaved | 179 | 74 | 253 |
| Hybrid poplar | 380 | 733 | 1113 |
| Native poplar | 127 | 98 | 225 |
| Other soft broadleaved | 193 | 152 | 345 |
| Coniferous | 680 | 385 | 1065 |
| Total | 4451 | 3281 | 7732 |

Source: NFCSO "Report on Forestations and Fellings in 2012"

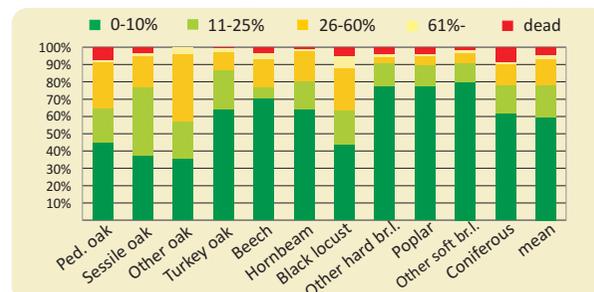
Timber products in 2012

| | total (net m ³) | ratio in assortment composition (%) |
|-----------------------------------|-----------------------------|-------------------------------------|
| Logs for panel products | 201098 | 3.0 |
| Sawlogs | 994671 | 15.1 |
| Other raw material for sawmilling | 447550 | 6.8 |
| Pitwood | 12381 | 0.2 |
| Pulpwood | 579383 | 8.8 |
| Bolt for panels | 485895 | 7.3 |
| Other industrial wood | 258451 | 3.9 |
| Technological chips | 7768 | 0.1 |
| Total industrial wood | 2987197 | 45.2 |
| Fuelwood | 3624288 | 54.8 |
| Total removals | 6611485 | 100.0 |

National distribution calculated on the basis of statistical sampling. Source: NFCSO

Forest health condition in 2012

Defoliation measured by the ICP Forests Monitoring System



Forest health condition is still good. In the year 2012 there was a slight deterioration in respect of defoliation. Average level of defoliation was 17.9%, which is higher than in 2011 (15.8%). The categories of "Other soft broadleaved", Poplar and Beech were in the best conditions. In these cases the proportion of asymptomatic trees exceeded 70%. The worst health condition was shown by the Oak and Black locust, where the proportion of asymptomatic trees remain below 45%.

Source: NFCSO Health Condition Database, data of 1st Jan. 2013

Organisational structure

Forest administration:



Other organizations concerned with forestry:



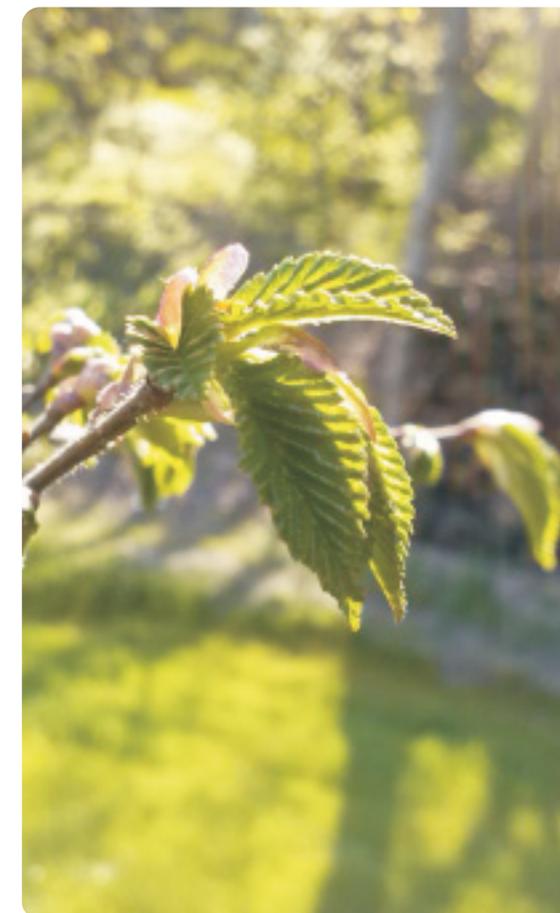
Forest research:

Forest Research Institute (FRI), Sárvár
University of West Hungary (UWH), Sopron

Professional training:

Higher education: University of West Hungary, Sopron
Secondary schools: Barcs, Mátrafüred, Sopron, Szeged
Trade schools: Ásotthalom, Miskolc, Piliscsaba, Somogyiszta-Szőcsénypuszta

Executive publisher: Márton Oravec president, National Food Chain Safety Office
Compiled by: Károly Wisnovszky, director, NFCSO Forestry Directorate
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Forest resources and forest management in Hungary

Budapest, 2013

National Food Chain Safety Office
Forestry Directorate



Comprehensive facts

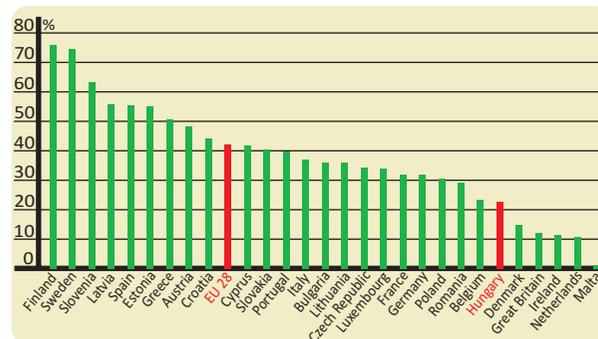


Source: Hungarian Central Statistical Office (HCSO) 2012; National Forestry Database, data of 1st Jan. 2013; NFCO "Report on Forestations and Fellings in 2012"

The history of modern forestry in Hungary

| | |
|-----------------|--|
| 1791 | The Parliament enacted the first feudal act. |
| 1879 | Enactment of the first modern forest act. |
| 1920 | As a result of a peace-treaty closing the World War, Hungary lost 84% of its forests, and forest cover decreased from 26% to 12%. |
| 1935 | The Act Nr. IV of 1935 was a forest act adjusted to the new geographical conditions of the country, and also covered nature conversation. |
| 1936 | Hungary hosted the second 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 joint tenures were cut back, about 30% of the forests were assigned to agricultural cooperatives. |
| 1961 | Enactment of the Act Nr. VII of 1961 on forests and wildlife management based on the socialist ownership structure. |
| 1996 | As a result of the change of political system, about 40% of forests were privatised. The legislative control for multiple-use and sustainable forestry is provided in ACT Nr. LIV of 1996 on forests and protection of forests. |
| 2009 | One main aim of the Act Nr. XXXVII of 2009 is to get forests closer to their natural conditions. On one hand, the act defines the 'quantitative naturalness' and prescribes that it must not decrease due to management activities. On the other hand, the act makes it obligatory to apply continuous cover forestry methods on a pre-determined area of state-owned forests. Furthermore, it ensures that the NGOs can take part in forest planning to a certain extent. |
| Main objectives | To ensure long-term environmental, economic and social services of forests by sustainable multiple-purpose forest management. |
| | To harmonize the interest of the society in sustainable forest management with the interests of owners and managements. |
| | To increase the forest area by afforestation up to 26-27% share on land. |
| | To maintain natural or close-to-natural forest stands composed by indigenous tree species and extend their area in accordance with prevailing site conditions. |

Forest cover in the EU countries



Source: State of Europe's Forests 2011

Forest land according to the National Forestry Database

| data of 1st Jan. 2013 | 1000 ha | ratio (%) |
|---|---------|-----------|
| Forest land (covered by tree stands or earmarked for plantation) | 1933.6 | 20.8 |
| Other wooded lands (nurseries, rides, permanent clearings, roads) | 122.0 | 1.3 |
| Total area of land in forestry use | 2055.6 | 22.1 |

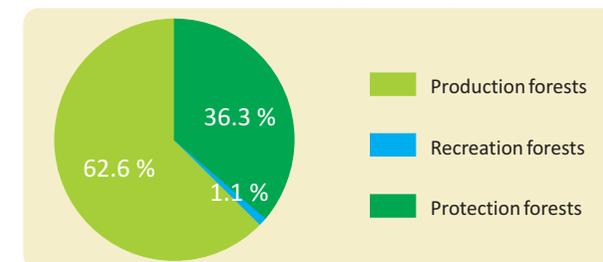
Forest land area and ownership categories

| County | Area (km ²) | Forest l. area (km ²) | Forest ratio (%) | In forestry use (km ²) | State (%) | Communal (%) | Private (%) | Mixed (%) |
|------------------------|-------------------------|-----------------------------------|------------------|------------------------------------|-------------|--------------|-------------|------------|
| Pest incl. Budapest | 6918 | 1704 | 24.6 | 1799 | 60.8 | 2.4 | 35.6 | 1.2 |
| Fejér | 4359 | 543 | 12.5 | 606 | 75.1 | 2.8 | 21.3 | 0.8 |
| Komárom-Esztergom | 2265 | 616 | 27.2 | 660 | 81.5 | 1.1 | 17.2 | 0.2 |
| Veszprém | 4493 | 1348 | 30.0 | 1542 | 65.6 | 0.4 | 33.1 | 0.8 |
| Győr-Moson-Sopron | 4208 | 814 | 19.4 | 900 | 71.1 | 0.5 | 28.4 | 0.1 |
| Vas | 3336 | 941 | 28.2 | 986 | 51.4 | 0.4 | 48.2 | 0.0 |
| Zala | 3784 | 1192 | 31.5 | 1258 | 52.9 | 0.6 | 42.6 | 3.9 |
| Baranya | 4429 | 1114 | 25.1 | 1167 | 54.9 | 1.5 | 42.1 | 1.5 |
| Somogy | 6036 | 1787 | 29.6 | 1908 | 56.5 | 0.8 | 41.4 | 1.2 |
| Tolna | 3704 | 662 | 17.9 | 708 | 57.5 | 0.5 | 41.1 | 0.8 |
| Borsod-Abaúj-Zemplén | 7250 | 2083 | 28.7 | 2167 | 60.1 | 1.3 | 37.6 | 0.8 |
| Heves | 3637 | 883 | 24.3 | 914 | 59.1 | 0.3 | 40.2 | 0.4 |
| Nógrád | 2545 | 991 | 38.9 | 1028 | 55.4 | 0.2 | 44.0 | 0.3 |
| Hajdú-Bihar | 6210 | 689 | 11.1 | 731 | 47.4 | 0.6 | 51.5 | 0.6 |
| Jász-Nagykun-Szolnok | 5582 | 326 | 5.8 | 353 | 45.4 | 2.9 | 51.1 | 0.6 |
| Szabolcs-Szatmár-Bereg | 5937 | 1245 | 21.0 | 1288 | 27.1 | 1.2 | 71.4 | 0.3 |
| Bács-Kiskun | 8444 | 1761 | 20.9 | 1862 | 47.4 | 0.7 | 50.7 | 1.2 |
| Békés | 5630 | 260 | 4.6 | 282 | 62.5 | 3.7 | 32.1 | 1.7 |
| Csongrád | 4263 | 377 | 8.9 | 397 | 49.3 | 1.5 | 49.1 | 0.1 |
| Total | 93030 | 19336 | 20.8 | 20556 | 55.7 | 1.2 | 42.1 | 1.0 |

Source: National Forestry Database, data of 1st Jan. 2013

Mixed means the forest property is divided among state, private and community. Before the transition of the political system the share of private forest was below 1%.

Distribution of forests by primary function



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.

Source: National Forestry Database, date of 1st Jan. 2013

Changes of the forest area (1920-2010)



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 and after the transition of the political system mainly implemented by private forest owners.

Data of 1940 and 1945 are missing. The light green clounms show estimated data. Source: National Forestry Database.

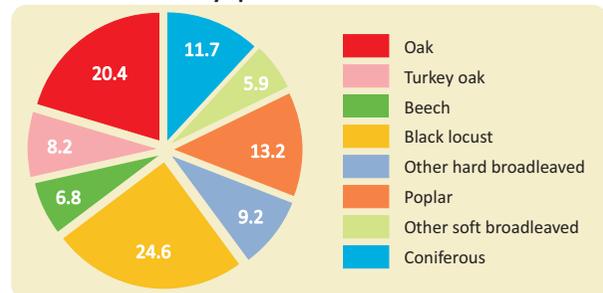
Afforestations in hectares (initial plantings)

| Growing year | State forests | Non-state forests | Total |
|--------------|---------------|-------------------|-------|
| 2004-2005 | 628 | 7029 | 7657 |
| 2005-2006 | 770 | 13219 | 13989 |
| 2006-2007 | 512 | 18436 | 18948 |
| 2007-2008 | 391 | 6941 | 7332 |
| 2008-2009 | 791 | 4377 | 5168 |
| 2009-2010 | 1084 | 4012 | 5096 |
| 2010-2011 | 143 | 2660 | 2803 |
| 2011-2012 | 516 | 4021 | 4537 |

Source: NFCO "Report on Forestations and Fellings in 2012"

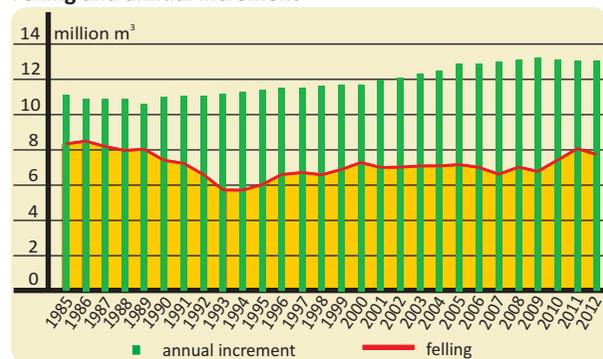
Annual increment, fellings and growing stock

Current increment by species

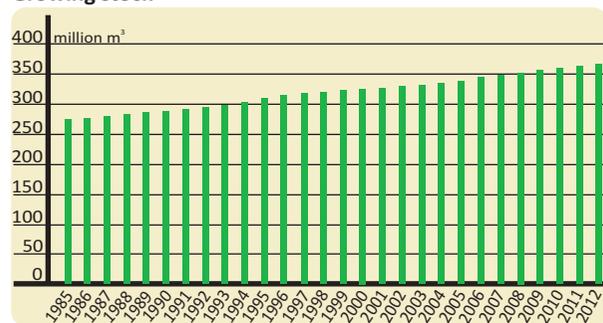


The gross annual increment is **13 million gross m³** per year. It is **0.413 gross m³** per sec, equal to the volume of a cube of 74.5 cm ledge.

Felling and annual increment



Growing stock

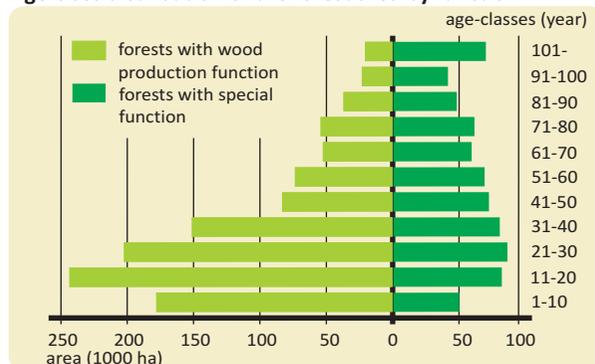


Growing stock has been steadily increasing since in each year the annual increment has been higher than the volume of felling and mortality.

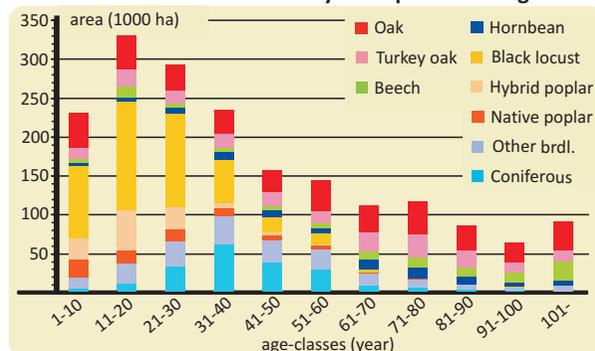
Source: NFC SO "Report on Forestations and Fellings in 2012" and National Forestry Database, data of 1st Jan. 2013

Tree species and age-class distribution

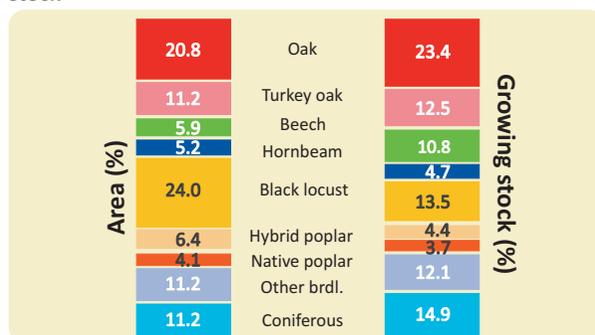
Age-class distribution of the forest area by function



Distribution of the forest area by tree species and age



Tree species distribution of the forest area and the growing stock



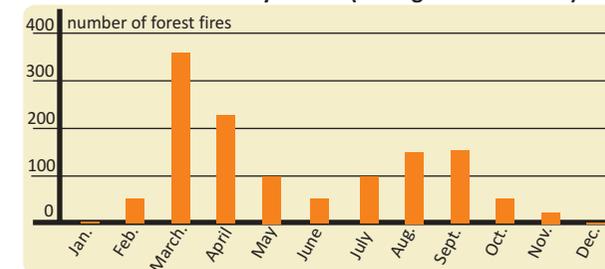
63% of the forest area is covered by indigenous species and 37% by alien or naturalized (Black locust, Red oak, coniferous), or cloned species (Hybrid poplar).

Source: National Forestry Database, data of 1st Jan. 2013

Forest fires

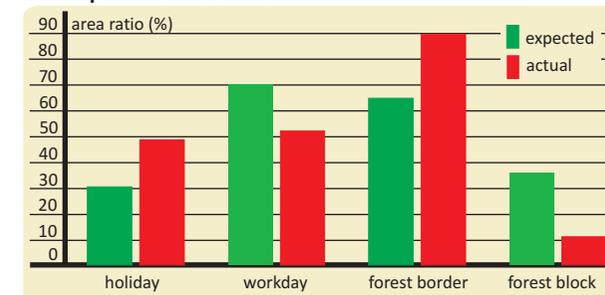
In Hungary, thousands of forest and vegetation fires break out yearly. In the extremely drought year of 2012 nearly 2700 of 21000 vegetation fires affected the forest or other wooded land.

Number of forest fires by month (average of 2008-2012)



Analyzing the average data of the past 5 years of forest and vegetation fires, a revolving tendency stands out, that there are two highly dangerous periods during the year. Surprisingly, the most dangerous period starts immediately after the snow melting and ends with the leafing, when the vegetation grows green. The spring forest and vegetation fires give nearly 60% of the whole number of fires. These fires break out mainly in northern Hungary and in the southern part of Pest County. The second dangerous period is in July and August. In these hot summer months mainly the coniferous trees of the Great Hungarian Plain are exposed to the danger of forest fires.

The expected and actual distribution of forest fires



Due to climate and vegetation circumstances, naturally induced forest fires are of no account in Hungary. 99% of forest fires are human induced (negligence or arson).

It is statistically proven, that forest fires occur more than expected during holidays as on workdays. It can be observed, that the area of fires inside the forest block are smaller, and on the border of the forest are larger than expected. This is due to fires coming from agricultural areas. The fewer number of fires within the forest block suggests that the majority of forest fires are not naturally induced.

Source: NFC SO Forest Fire Information System 2012

