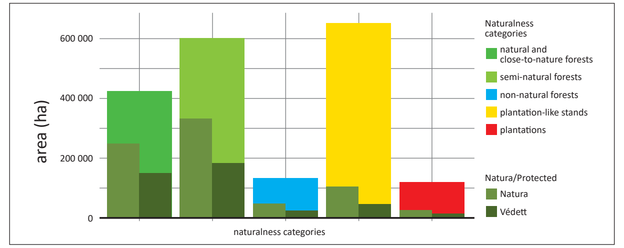
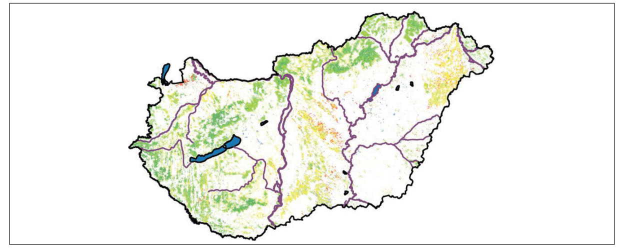
Naturalness, nature conservation, close-to-nature forestry

Distribution of total, Natura 2000 and protected areas by naturalness categories



Forest naturalness is estimated from tree species composition. Most of the Hungarian forests are categorized as natural, close-to-nature and semi-natural forest.

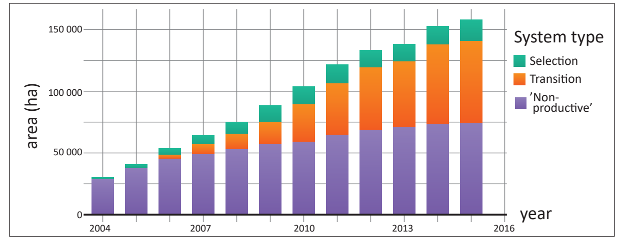


Forest areas of high nature conservation value

Protected areas (ha)			Natura 2000 sites (ha)		
Strictly protected	Protected	*Total*	Protected	Not protected	*Total*
73 391	385 021	*458 412*	416 180	417 771	*833 951*

22% of the total forest area is protected and 40 % of that belongs to the Natura 2000 network.

Close-to-nature forestry – evolution of continuous cover forestry systems



Systems ensuring continuous forest cover have been more and more applied in the last years. The common feature of these systems is that there is no final cutting and consequently contiguous large areas without tree stand do not occur. In Hungary, three kinds of such systems are defined: the selection system (harvests are carried out frequently but only in small patches), the transition system (the main objective of which is to switch from rotation system to selection system) and the 'non-productive' system (with the main aim to let natural processes take their course).

Forestation data (2015)

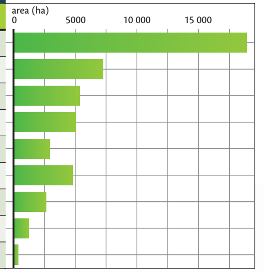
	State forests	Non-state forests	*Total*
Newly forested areas		(ha)	
Regeneration	7 355	9 634	*16 989*
Afforestation	135	183	*318*
Replacement planting		(ha)	
Regeneration	2 230	1 012	*3 242*
Afforestation	43	91	*134*
Forestations successfully finished		(ha)	
Regeneration after clearcutting	7 895	8 425	*16 320*
Regeneration after shelterwood cutting	1 991	257	*2 248*
Afforestation	270	5 529	*5 799*
Duration of forestation phase		(year)	
Regeneration after clearcutting	7,1	7,0	*7,0*
Regeneration after shelterwood cutting	16,0	14,3	*15,8*
Afforestation	7,2	7,8	*7,7*

Tree stand type area distribution of newly forested areas

	Regeneration	Afforestation
Noble oak	1 801	77
Turkey oak and other hardwood species	875	43
Beech	59	0
Black locust	8 685	106
Hybrid poplars and willows	2 281	66
Native poplars and other softwood species	2 759	24
Conifers	529	2
Total	*16 989*	*318*

Evolution of newly afforested areas

Growing year	State forests	Non-state forests	*Total*
		(ha)	
2006-2007	512	18 436	*18 948*
2007-2008	391	6 941	*7 332*
2008-2009	791	4 377	*5 168*
2009-2010	1084	4 012	*5 096*
2010-2011	143	2 660	*2 803*
2011-2012	517	4 021	*4 537*
2012-2013	136	2 395	*2 530*
2013-2014	201	1 086	*1 287*
2014-2015	135	183	*318*

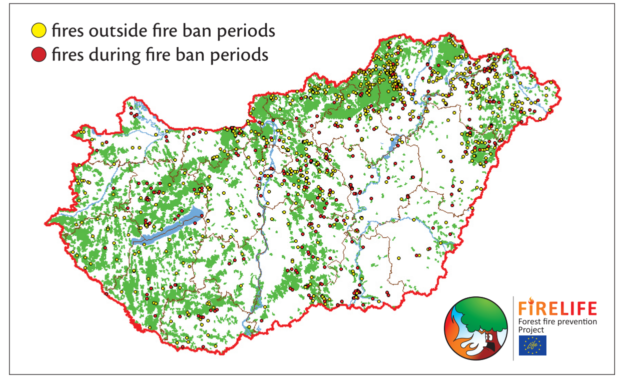


Since growing year 2006-2007, size of newly afforested area has been decreasing reaching the minimum value in 2015.

Forest fires and other damages

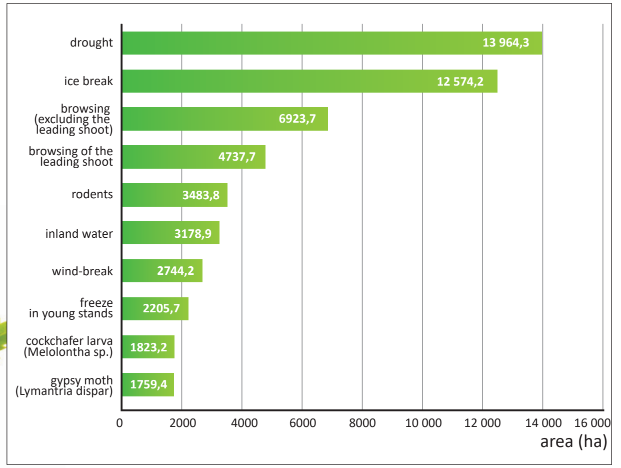
Fires appearing during fire ban periods (Forest Fire Information System 2015)

In Hungary, 99 % of the fires are intentionally or negligently human-induced. ***Moreover, 40-50 % of the fires appeared during the fire ban period.***



This fact turns attention to the importance of public communication campaigns as a tool of prevention. This was the motivation behind a Fire Life project between 2014 and 2018 which was initiated by the Forestry Directorate and supported by the European Union. There were already 14 educational events for children. Through playful competitions, dangers of forest fires were introduced to them, and they could learn basic rules on how to set and extinguish a fire. In frequented tourist destinations during fire danger periods, forest fire guards were established partly in order to propagandize forest fires. Training courses on prevention and extinguishing were organized for experts in six localities. Guides, games and posters can be downloaded from: ***www.erdotuz.hu***

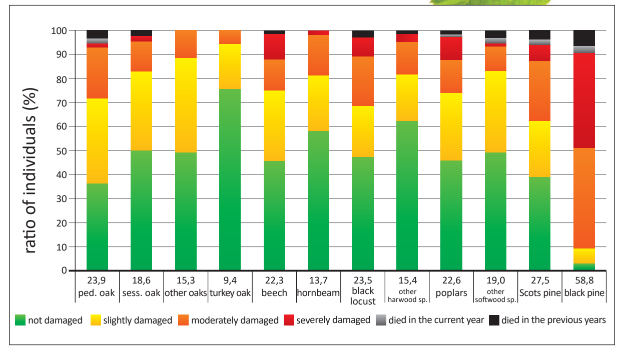
The largest forest damage areas (Forest Damage Database 2015)



Among damage types, drought occurred on the largest area in 2015. However, even this area amounted only to 0.7 % of total forest area.

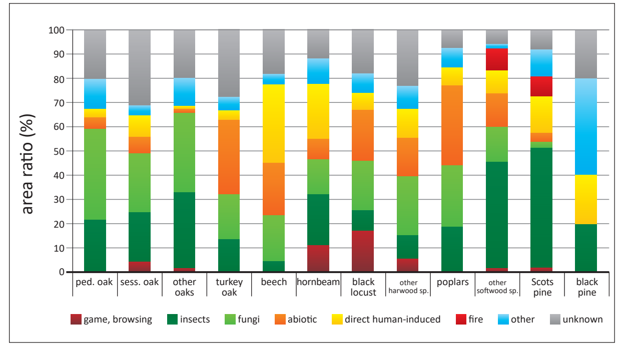
Forest health condition (Forest Protection Network 2015)

Defoliation categories and average defoliation by tree species groups



Health condition of the Hungarian forests did not change considerably between 2014 and 2015. On country-level, the average defoliation rate was 20.5%. Turkey oak and the group of 'other hardwood species' were the healthiest having more than 60 % of the sampled trees in the 'not damaged' category. Black pine was the most severely damaged.

Distribution of damage types by species groups



The most common damage types were 'insect' and 'fungi' for all tree species groups. Beside these types, abiotic damages, especially drought also occurred in groups such as poplars, turkey oak, beech and black locust.

Systematic forest inventory

Field works of the first five-year-long period of systematic forest inventory was finished in 2014.

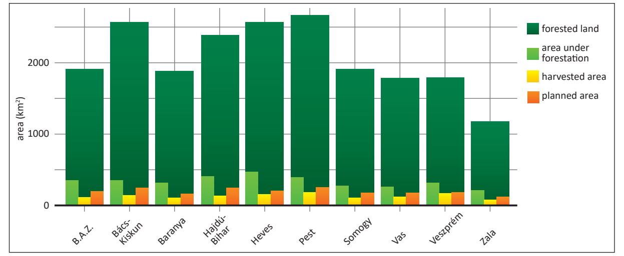
The main objectives of the inventory:

- monitoring the ecological status of forests;
- estimation of forest economical resources;
- providing information for sustainable forest management and long-term prognosis of forest stands;
- supply forest data for various domestic and international purposes.

Forestry Directorate published the results on a sophisticated webpage from which various data can be downloaded:
http://erdoleltar.nebih.gov.hu

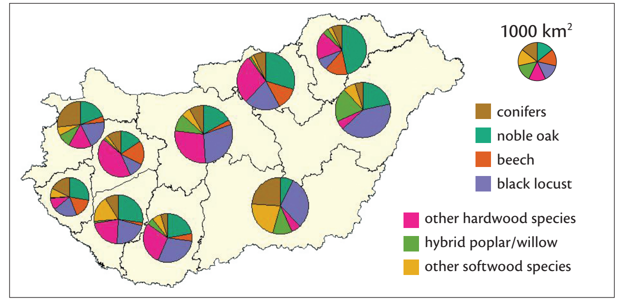
Organisational structure, characteristics of forest lands of County Government Offices

Characteristics of forest lands of County Government Offices



The largest forest area can be found on the jurisdiction area of Government Office for Pest County. Forest management plans are made for approximately 10% of forest area every year. Area of harvests is usually smaller whereas forestation area is occasionally a lot larger than it.

Distribution of tree stand types by County Government Offices



Distribution of tree stand types reflects the ecological conditions of the given county leading to considerable differences among County Government Offices. Beech and noble oak stands are abundant in area of Government Offices for Nógrád and Borsod-Abaúj-Zemplén Counties where the North Hungarian Mountains lies. Conifer plantations cover large areas of the Great Hungarian Plain (Government Office for Bács-Kiskun County) and Western Transdanubia (Government Offices for Vas and Zala Counties).

Organisational structure – Forest administration

Ministry of Agriculture	**Department of Forestry and Hunting**	***Section of State Forest Management***	
		Section of Forest Administration	
	Department of National Park and Landscape Protection		
	National Food Chain Safety Office	***Forestry Directorate***	
		Directorate of Plant Production and Horticulture	*Department of Forestry and Energy Reproduction Materials*
Prime Minister's Office	**County Government Offices**	***Department of Agriculture and Forestry (10)***	

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Edited by: Péter Debreceni, György Dézsma, Éva Michelcsik, Dóra Nagy, Dr. Tamás Tobisch; fotó: István Czirok; Contact person: TobischT@nebih.gov.hu.
Source of data (if not indicated): National Forestry Database (1 January 2016)

Forest resources and forest management in Hungary 2015

nébih
National Food Chain Safety Office
Forestry Directorate

Summary figures on forests

Registered forest land area	thousand ha	2 060.8
Area of forest subcompartments	thousand ha	1 940.7
Area of other subcompartments (lanes, openings etc.)	thousand ha	120.1
Forest ratio calculated from the registered area	percentage	22.2
Forest ratio calculated from the area of forest subcompartments	percentage	20.9
Standing volume	million gr. m³	378.5
Annual increment	million gr. m³	13.0
Total felling volume	million gr. m³	7.4
Volume of final cutting	million gr. m³	5.0
Afforestation area	thousand ha	0.3
Regeneration area	thousand ha	17.0

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. Forest cover decreased from 26% to 12%.
1935 The Act Nr. IV of 1935 on forest considered the new geographical conditions of the country and covered nature conservation.
1936 Hungary hosted the 2nd World Forestry Congress and the 9th Congress of IUFRO
1945 Private forest holdings above 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 management based on socialist terms.
1996 As a result of the political system change in 1989, about 40% of the forests were privatized. The legislative control for multiple-use and sustainable forestry was regulated by the Act Nr. LIV of 1996 on forests and protection of forests.
2009 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 should not decrease due to management activities. On the other hand, it prescribes continuous cover forestry methods on a predetermined area of state-owned forests. Further, it enables NGOs' contribution in forest management planning.

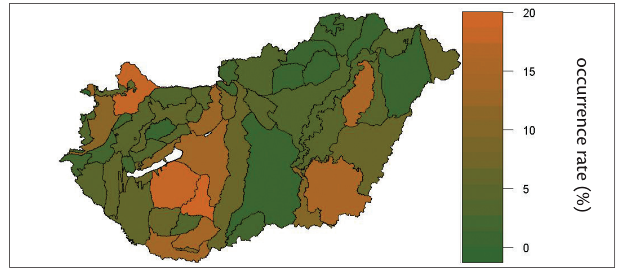
Main objectives of the current forest management

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

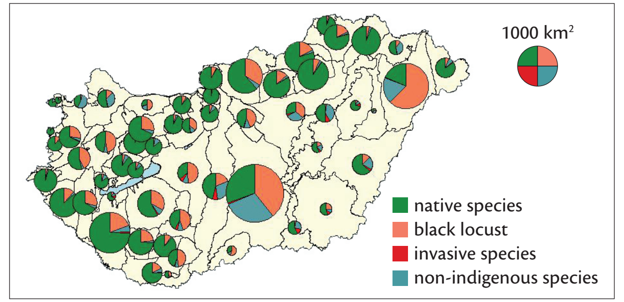
Tree species of 2016: field elm (*Ulmus minor*)

The oldest registered field elm tree is 147-years-old. Database data shows that field elm trees can achieve the size of 27 m height and 60 cm diameter in breast height.

Field elm occurrence rate in forest subcompartments of forestry regions



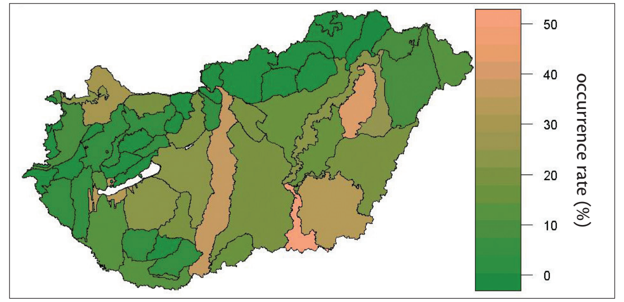
Indigenous and non-indigenous tree species in the Hungarian forests Area of indigenous and non-indigenous tree species in forestry regions



The invasive tree species are those non-indigenous species which can spread rapidly in the forests and endanger their biological diversity. Beside black locust (which is categorized as invasive, too), invasive species occupy only a small portion of the entire area of the country.

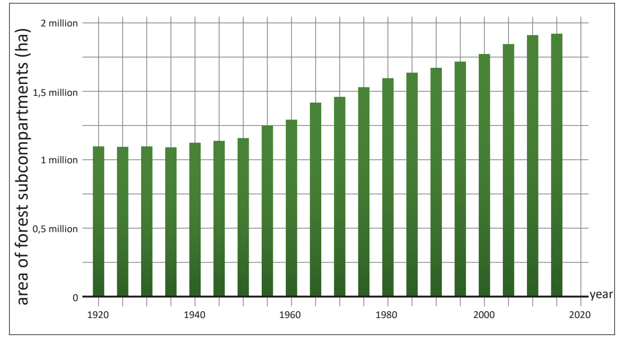
Prevalence of invasive tree species by forestry regions

Although the cover of invasive species (excluding black locust) hardly exceeds 1 % of the total managed forest land, proportion of forest subcompartments in which these species are present can be relatively high in some forestry regions mainly in river flood basins.

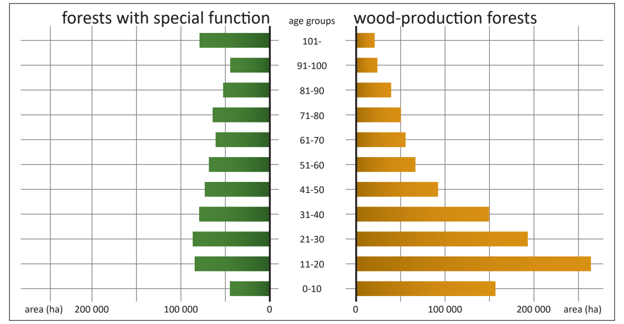


Statistics related to forest area

Evolution of forest area

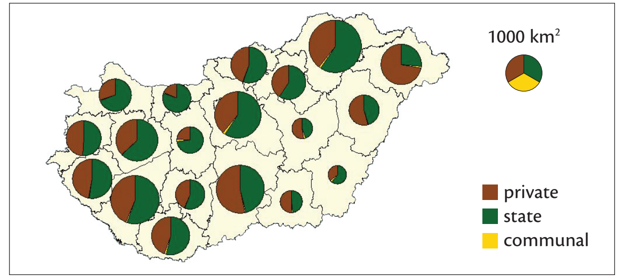


Forest area distribution by function and age group



Cutting age is directly connected with forest function. In wood production forests, the main objective to be taken into consideration is the quantity and quality of wood. Thus, stands of fast-growing species (such as black locust or hybrid poplars) are cut relatively early. In forests with non-production functions, forest management is driven not only by wood production but also by other issues. Consequently, the proportion of old forests is higher as well as there are no such high differences between the areas of age-groups as in the case of wood production forests.

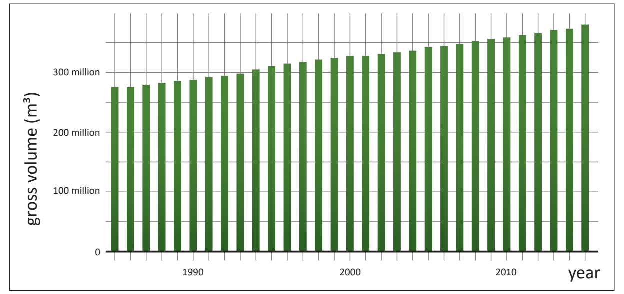
Area and ownership distribution in the counties



The largest forest area covering approximately 10 % of the total forest area of the country can be found in county Borsod-Abaúj-Zemplén whereas forest ratio is the highest (40 %) in county Nógrád. On country-level, more than half of the total forest area (56 %) is covered by state forests.

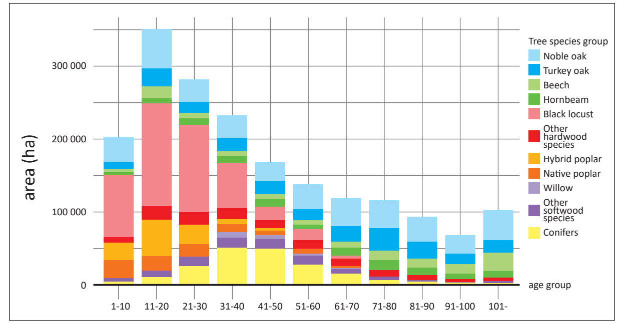
Growing stock and species composition

Evolution of growing stock



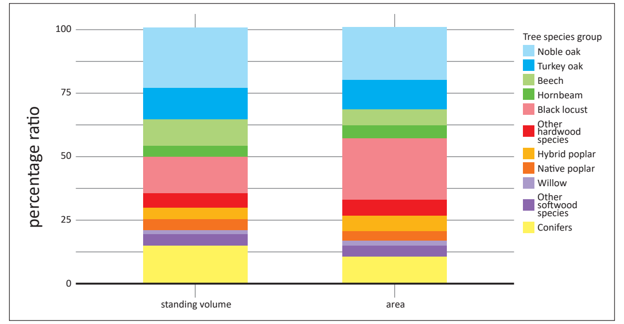
As a consequence of the planned forest management, growing stock of the Hungarian forests has been steadily increasing in the last three decades.

Area of species groups by age classes



Age distributions are highly influenced by the cutting ages. Thus, proportion of fast-growing species with short rotation period (black locust, hybrid and native poplars) is higher in the younger age classes whereas area of the slow-growing species with long rotation period (noble oak, turkey oak, beech) is relatively large in older age groups. More than half of our forests are 40-years-old or younger.

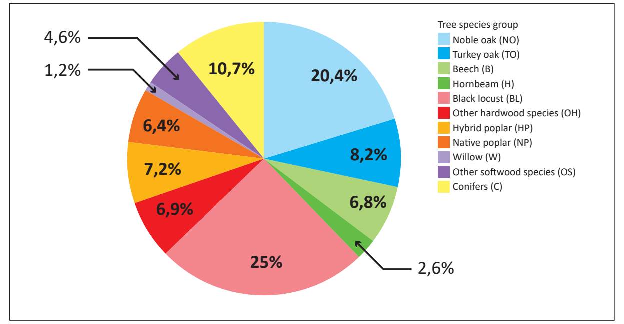
Area and growing stock distribution of tree species groups



In Hungary, noble oak has the highest standing volume. However, the highest area proportion belongs to black locust.

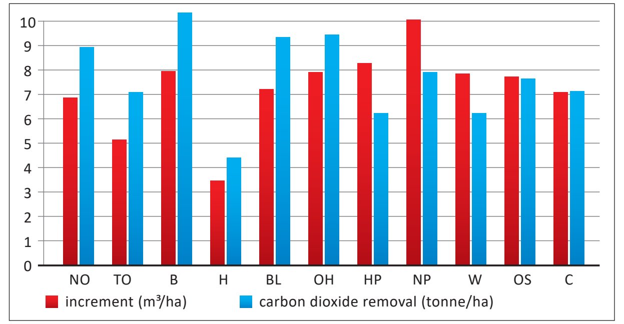
Annual increment and carbon dioxide removal

Increment distribution among tree species groups



Total annual increment was 13 million m³ in 2015. Noble oaks and black locust produced almost the half of the total increment.

Increment and carbon dioxide removal by species groups

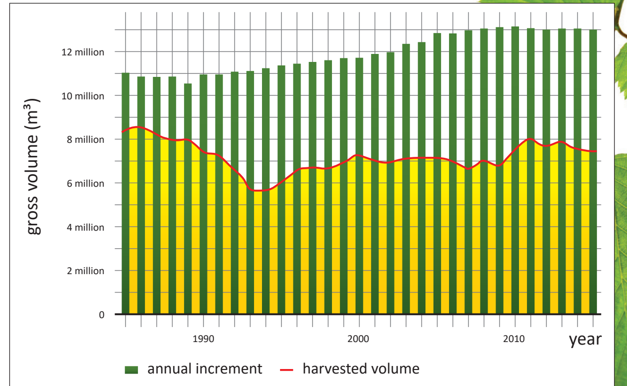


Poplars produced the largest increment per hectare. However, due to their low wood densities, poplars adsorbed less carbon dioxide than beech or noble oaks wood density of which is much higher.

CO_2 quantity removed by the Hungarian forests approximately equals the total emission of 3 million cars during one year, assuming that an average car runs yearly 20 000 km with a 7 l/100 km petrol consumption. This means that the CO_2 quantity removed by the total annual increment of the Hungarian forests is roughly equal to that emitted from the Hungarian passenger car stock (source of input data: https://co2.myclimate.org/en/car_calculators; http://www.ksh.hu/docs/hun/xftp/idoszaki/jelszall/jelszall11.xls).

Harvested volume (2015)

Annual cut volume and increment



Annual increment has been higher than harvested volume in the past decades leading to a steadily increasing standing volume.

Total felling volume by harvest types

	State forests	Non-state forests	*Total*
	gross thousand m³		
Cleaning	140	91	***231***
Pre-commercial thinning	393	316	***709***
Commercial thinning	643	139	***782***
Final cutting	2 869	2 146	***5 015***
Selection system	30	2	***32***
Permanent forest cover	1	12	***13***
Sanitary cutting	424	89	***513***
Other harvest types	47	13	***60***
Total	***4 547***	***2 808***	***7 355***

Total felling volume by species groups

	State forests	Non-state forests	*Total*
	gross thousand m³		
Noble oak	740	200	***941***
Turkey oak	666	149	***815***
Beech	559	107	***666***
Hornbeam	191	71	***262***
Black locust	542	946	***1 488***
Other hardwood species	215	61	***276***
Hybrid poplar	424	648	***1 072***
Native poplar	122	135	***257***
Willow	47	28	***75***
Other softwood species	155	109	***264***
Conifers	886	354	***1 240***
Total	***4 547***	***2 808***	***7 355***