

Forest fires in Hungary

2020

(Reported by: National Food Chain Safety Office)

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Fire danger in 2020 fire season

FWI derived data and values were reported throughout the whole fire season by forest authority (FA). FA has been using JRC's data service to monitor the daily fire danger situation. Compared to previous decades, worldwide 2020 was one of the hottest years in terms of temperature, according to the ERA5 global re-analysis database.

In Hungary, the average annual temperature was 1.2 degrees higher than the average of the last 30 years. The amount of precipitation was similar to the previous year. However, the distribution of precipitation in space and time was extreme. Precipitation in April was only 25% of the multi-year average only. There was no rainfall in most of the country this month. Due to very dry period the fire danger has been increased causing a lot of fire events. The high endangered period shifted to 25th Mai last year. From start of 10th April a total fire ban was ordered and it took for 46 days. Because of the uneven distribution of precipitation in the second part of summer there were a short period, when the FWI values reached the high and extreme level in first days of August. A short total fire ban was ordered that time in pine wood region in the Great Plain.

Fire occurrences and affected surfaces

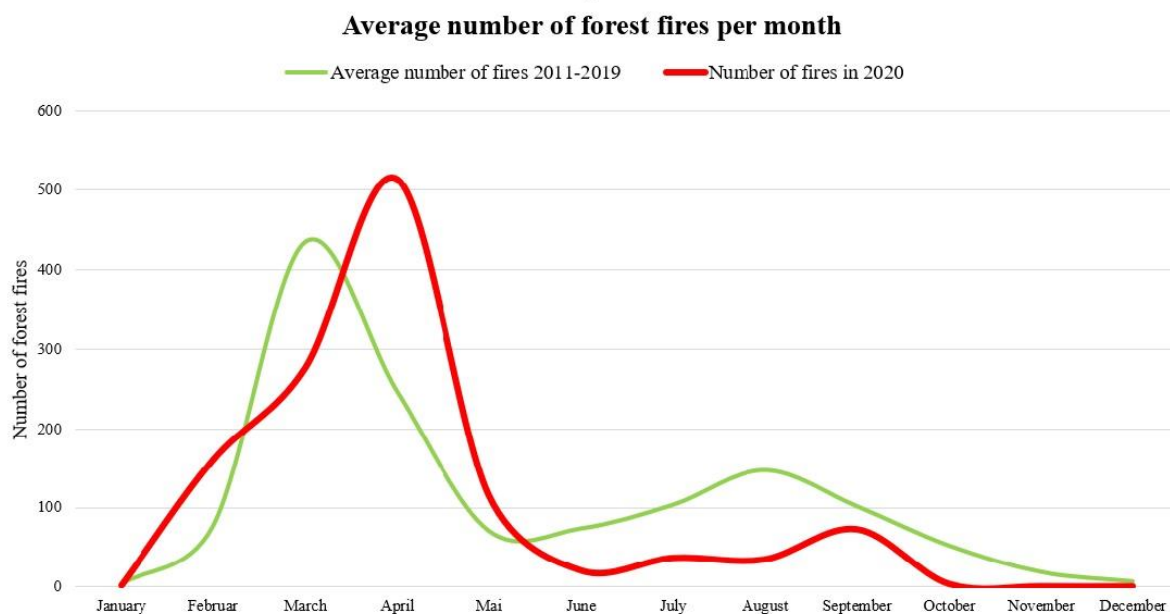
Forest fires data are collected in a close cooperation with disaster management authority. Data collected on the spot by fire fighters. They uploaded to the database weekly but if it necessary they can collect it day by day. Forest fires data are produced and analysed with a GIS method and checked on the spot by forest authority. Gathered fire data are processed and evaluated by size, date, cause, duration of fires. They are compared with traditions in forest management processes and behaviour of visitors and hikers in forest land area. The table 1. shows the total values between 2011 and 2020.

Table 1.				
Year	Number of wildfires	Forest fires		Wildfires in other land
		Number of fires	Total burned area (ha)	Number of fires
2011	8 436	2 021	8 056	6 415
2012	15 794	2 657	14 115	13 137
2013	4 424	761	1 955	3 663
2014	5 535	1 042	4 454	4 493
2015	5 057	1 069	4 730	3 988
2016	2 531	452	974	2 079
2017	6 782	1 454	4 934	5 328
2018	2 981	530	906	2 451

2019	7 296	2 088	6 541	5 208
2020	4 339	1 239	2 895	3 100

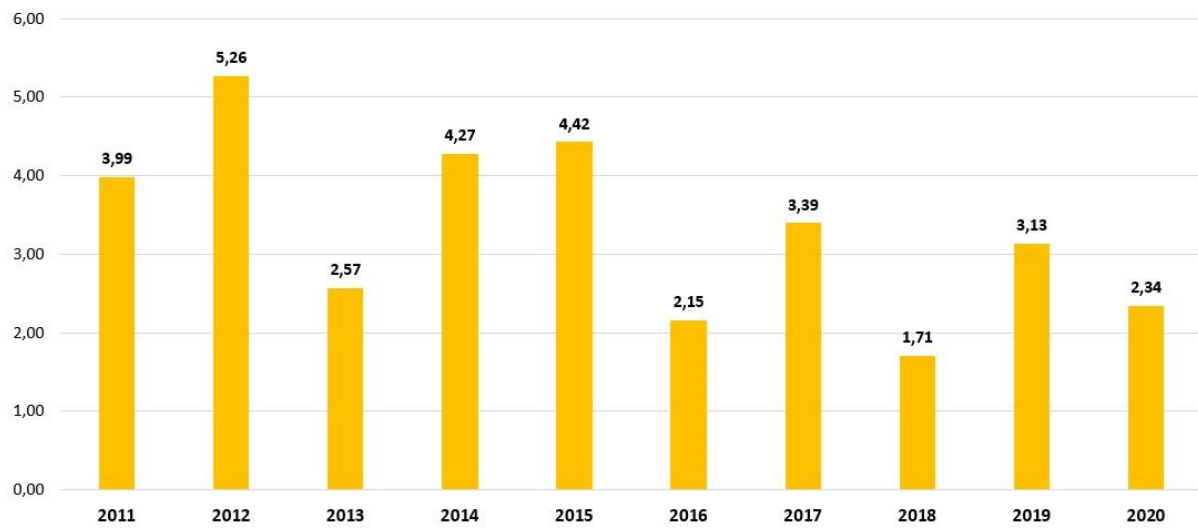
Figure 2. represents the tendencies experienced in last decade (2011-2020) that there are two most endangered forest fire periods during every year. Traditional using of grassland includes burning methods in early spring, which can accidentally spread to nearby forest. These fires usually burn in March and April. Spring vegetation fires usually burn with low or medium intensity in broadleaf forests, juvenile growths, shrubs and grasslands. Fire totally or partially consumes forests and causes serious harms. Based on yearly data set (2011-2020), we found that 85% of forest fires have been occurred due to long dry period in April and Mai. The number of forest fires in April and Mai was 2 times higher than in the same month of the base period (2011-2019). This summer the number of fires has fallen by half compared to the average of the last decade due to rainy August.

Figure 1.



A total of 1.239 forest fires were registered in 2020. This value is not extrem, it means considered medium in this decade. The average burned area was 2,34 ha.

Figure 2.
Average fire size of forest fires
2011-2020



The yearly trends in terms of number of fires and burnt areas between 2011 and 2020 are shown in Figure 2-4.

Figure 3.
Number of forest fires
2011-2020

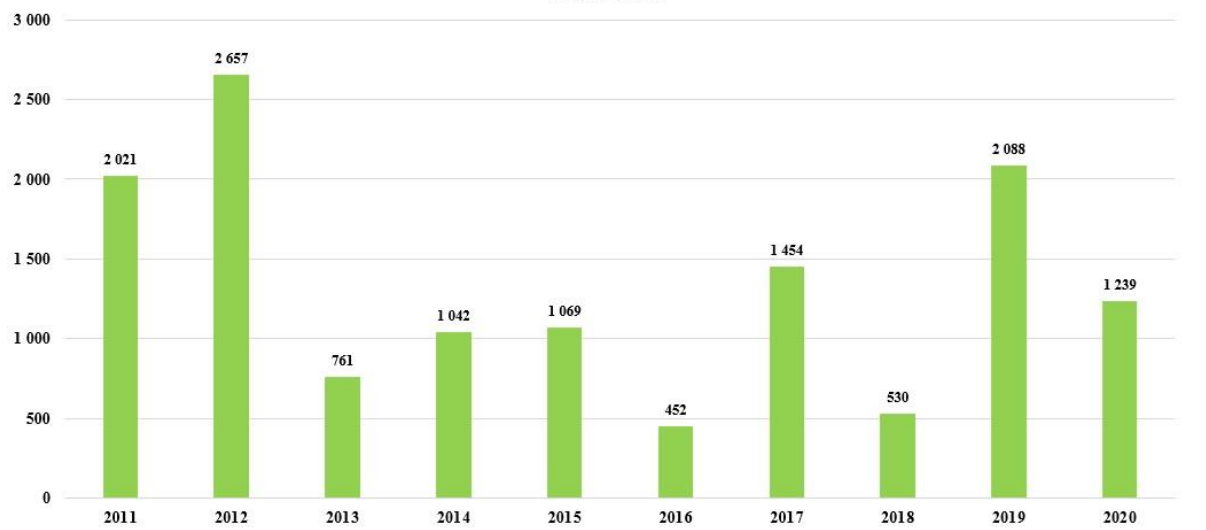
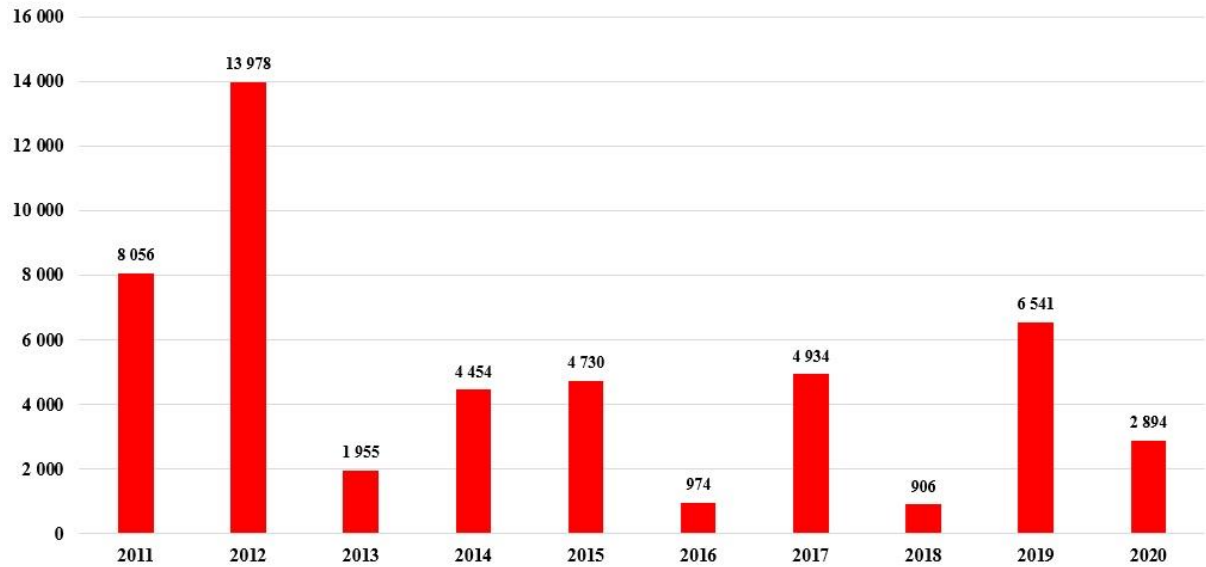


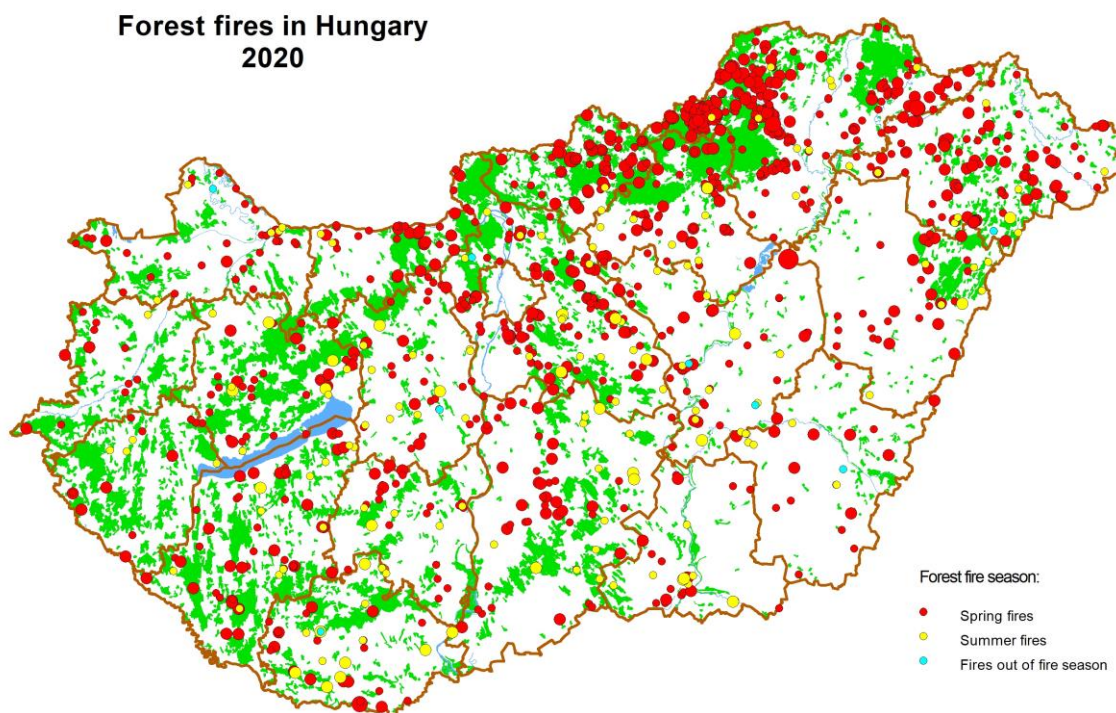
Figure 4.
Total burnt area in forest fires
2011-2020



Total of 1065 forest fires occurred in spring which is 85% of all forest fires in 2020. Most part of spring fires (45%) burn in northern areas (Borsod-Abaúj-Zemplén County, Heves County, Nógrád County and Pest County) which indicates these areas as high forest fire danger zones. In these areas not only traditional grassland management methods, but other social-economic factors add to forest fire danger. Unlike spring fires, summer fires usually burn in the Great Hungarian Plain. Map 1. shows places of forest fires in Hungary in endangered periods of the year.

Total of 166 forest fires occurred in summer period but there were no large fire last summer.

Map 1.



98% of forest fires were surface fires in 2020 fire season, when surface litter and other dead vegetal parts and smaller shrubs burnt down. The average rate of fires smaller than 1 hectare is almost 74 %. There was no large fire in 2020. There was only 4 fire events where more than 50 hectares were burnt. (table 2.)

Table 2.		
Classification of burnt area	Number of forest fires	Burnt area (hectare)
less than 1 ha	927	258
1 – 50 ha	308	2.330
50 – 100 ha	3	206
100 – 500 ha	1	101
more than 500 ha	0	0
Total:	1.239	2.895

99 % of forest fires are human induced (negligence or arson). Most fires are induced by (adults and infants) negligence and only a small proportion of fires are caused by arsonists. Typical forest fire causes are the incorrectly extinguished fires of hikers, and the illicit agricultural fires, throwing cigarette butt and sometimes slash burning.

Analyzing the statistics we can see that total of 1.523 hectares of forest land were burned or affected by forest fire during 2020. In addition, more than 742 hectares of grass vegetation and 629 hectares of other wooded land were destroyed in forest fires. (Table 3.)

Table 3.	
Burnt fuel types in forest fires	Total burnt area (ha)
Forested land	1.523
Other wooded land	742
Other land	629
Total:	2.895

Fire fighting means

85 % of forest fires were usually extinguished in less than an hour after arrival on place of fire. Fire service arrived to fire in 30 minutes in average.

As part of a development 20 wildland fire vehicles were put into service by Fire Service in forest fire endangered counties. The vehicles are equipped with hand tools and slip on units.

Injuries and losses of human lives

Five fire fighters were injured during fire fighting in 2020. There were no deaths last year.

Operations of mutual assistance

Fire service equipment was not heavily damaged. Neither Fire Service nor Forest Authority served mutual assistance last year.

Fire prevention activities and fire information campaign

National Fire Prevention Committee established by the government has been monitoring all fire prevention activities. Members of committee are appointed by leaders of Fire Service and National Food Chain Safety Office as a forest authority. Forest fire prevention activities are implemented by forest authority.

Although the Firelife project entered the follow-up period after finishing, the effective communication developed in the project was continued during the spring and summer fire seasons with the budget support of National Food Chain Safety Office. Thousands of posters and flyers were distributed in 2020.

The communication project drew attention to the forest forest fire problem and restarted many fire prevention processes that had been abandoned. On the basis of the information received during the implementation of the project, we have improved the fire prohibition system, which now operates

more flexibly and faster, using forest fire indices calculated by the EU JRC. Daily updated fire-prevention maps have been placed on the projects website, where related leaflets can be accessed immediately.

Climate conditions and how they impacted the fire season

Meteorological analyzes show that both spring and summer mean temperatures has been risen by more than 1.5 degrees from the base period (1980-2010). The increase in the number of heat days in summer also indicates a warming trend.

The amount of annual precipitation decreases slightly in Hungary. The decline is similar to the trend in Southern Europe. Comparing the four seasons, the largest decrease in precipitation occurred in the spring, compared with last 100 years. Summer precipitation has not decreased dramatically, but there are significant differences in its distribution. The number of rainy days has decreased. Precipitation is falling increasingly in short intense showers and thunderstorms.

As a result of the changes presented above, it can be shown that the fire season starts in mid-February and lasts until the end of October in dry years. The number of fire danger days increased during drought springs. In summer, very high and extreme FWI values occur in the Great Plain region 1-2 weeks long.

National adaptation strategy

The forestry authority has proposed a review of forest fire prevention plans at the national and county levels. The criterias and content of review has been compiled by forest authority following the suggestions and best practices published in issue of European Commission Expert Group on Forest Fires in 2021. The proposal has been submitted to the National Fire Prevention Committee. The status of the project is planned. Fire Service is developing a disaster management decision support system based on a GIS system. which includes forest fire prevention modules. The status of the project is under development.

Research activities aimed at improving fire management

Forest authority has a volunteer study to gather the aspects that may be suitable for determining periods of fire risk and evaluating the effectiveness of forest fire prevention activities in Hungary. We are focusing on daily fire risk values and length of periods when a fire may occur.