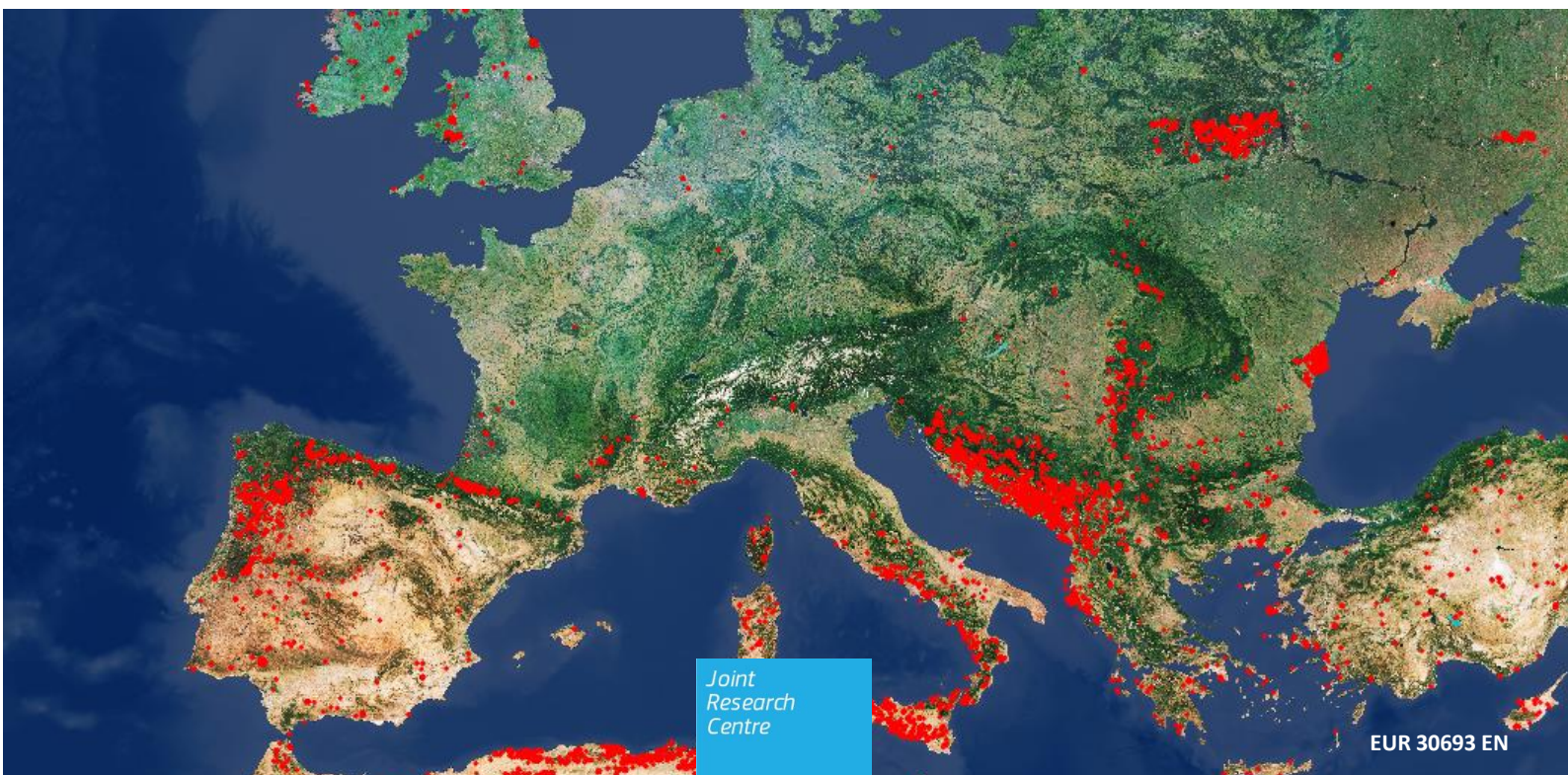




## JRC TECHNICAL REPORT

# Advance EFFIS Report on Forest Fires in Europe, Middle East and North Africa 2020

2021



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Cover image: EFFIS – Distribution of burnt areas mapped in 2020

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## 1 The European Forest Fire Information System (EFFIS)

The European Forest Fire Information System (EFFIS) has been established jointly by the European Commission services (DG ENV and JRC) and the relevant fire services in the EU Member States and European countries (Forest Services and Civil Protection services). Research activities for the development of the system initiated at JRC in 1998 and the first EFFIS operations were in the year 2000.

In 2003, EFFIS was embedded in the new Regulation (EC) No 2152/2003 (Forest Focus) of the European Council and Parliament on monitoring of forests and environmental interactions until it expired in 2006. Since then EFFIS operated as a voluntary system of information on wildfires until 2015, when it became part of the EU Copernicus program, under the Emergency Management Services.

Acting as the focal point of information on forest fires, EFFIS supports the national services in charge wildfire management. Currently, the EFFIS network is made of 43 countries in Europe, Middle East and North Africa. EFFIS provides specific support to the Emergency Response Centre (ERCC) (formerly Monitoring and Information Centre (MIC)) of Civil Protection as regards near-real time information on wildfires during the fire campaigns and assists other DGs through the provision of both pre-fire and post-fire information on wildfire regimes and impacts. It provides information that supports the needs of the European Parliament with regards to wildfire management, impact in natural protected areas and harmonized information on forest fires in the EU.

EFFIS also centralises the national fire data that the countries collect through their national forest fire programmes in the so-called EFFIS Fire Database. The EFFIS web services<sup>1</sup> allow users to access near-real time and historical information on wildfires in Europe, Middle East and North Africa.

EFFIS provides continuous monitoring of the fire situation in Europe and the Mediterranean area, and regularly sends updates to EC services during the main fire season. The information about the on-going fire season is continuously updated on the EFFIS web site (up to 6 times, daily), which can be interactively queried<sup>2</sup>. EFFIS provides daily meteorological fire danger maps and forecasts of fire danger up to 9 days in advance, updated maps of the latest active fires, wildfire perimeters and post-fire evaluation of damage.

The EFFIS module for the assessment of meteorological forest fire danger is the EFFIS Danger Forecast. This module forecasts forest fire danger in Europe, part of North Africa and the Middle East, on the basis of the Canadian Fire Weather Index (FWI), allowing a harmonized evaluation to be made of the forest fire danger situation throughout Europe and neighbouring countries.

The damage caused by forest fires in Europe and neighbouring countries is estimated using the EFFIS Rapid Damage Assessment module. Since 2000, cartography of the burned areas is produced every year through the processing of satellite imagery. In the year 2003, due to the availability of daily satellite imagery from the MODIS sensor on board the TERRA and AQUA satellites, the RDA provided frequent updates of the total burnt area in Europe. In 2007, the RDA was updated twice a day and currently, since 2016, it is updated 3 times a day. Further to the mapping of burnt areas, the analysis of which types of land cover classes are affected by fires is performed. This module uses MODIS satellite imagery with a ground spatial resolution of about 250 metres, which permits the mapping of fires of around 30 ha or larger. The burned area mapped by EFFIS corresponds, on average, to around 75% to 80% of the total area burnt in Europe each year.

---

<sup>1</sup> <http://effis.jrc.ec.europa.eu>

<sup>2</sup> see <http://effis.jrc.ec.europa.eu/current-situation>

## 1.1 EFFIS Danger Forecast: 2020 results

The EFFIS Danger Forecast was developed to support the Commission's Directorate-General for the Environment and the forest fire-fighting services in the EU Member States. In 2002, at the request of the Member States, operation of the EFFIS Danger Forecast was extended to six months starting on 1 May and ending on 31 October, and in 2006 to nine months, from 1 February to 31 October. From 2008 the EFFIS Danger Forecast system has run continuously throughout the year without interruption.

The geographic extent has been enlarged over the years from the initial extent that covered only the Mediterranean region. Now the system covers the whole of Europe and MENA (Middle East & North Africa) countries.

The meteorological data used to run the model has also changed during the years. At the beginning the system started using forecasted data provided by MeteoFrance with a spatial resolution of around 50 km. Then over time other providers were included, such as DWD (Deutscher Wetterdienst) and ECMWF (European Centre for Medium-Range Weather Forecast) and the resolution has improved. Now the system runs with three different data sets from three providers: ECMWF (the primary), MeteoFrance and DWD; with a spatial resolution in a range from around 10 km to 25 km.

In this chapter the fire danger trends assessed by EFFIS in the different countries during the 2020 fire season are presented, comparing them with long term trends.

Through the Danger Forecast module of EFFIS the situation has been continuously monitored and the risk level analysed and mapped.

The following figures show fire danger throughout 2020 as determined by the average FWI values assessed in the individual countries.

In a change from previous reports, this year we present fire weather index data for the current year, showing how it compares against the long-term minimum and maximum, the 10-90<sup>th</sup> percentiles, and the long term average (measured from 1980-2020). This makes it possible to see whether and when extreme conditions occur in the current year.

The countries analysed are those participating in the EFFIS network for which data are available, and are presented in alphabetic order within the two groups (European countries and MENA countries) in the graphs that follow.

### How to read the charts

The red area encloses the most extreme values seen in the 40 year period from 1980-2020.

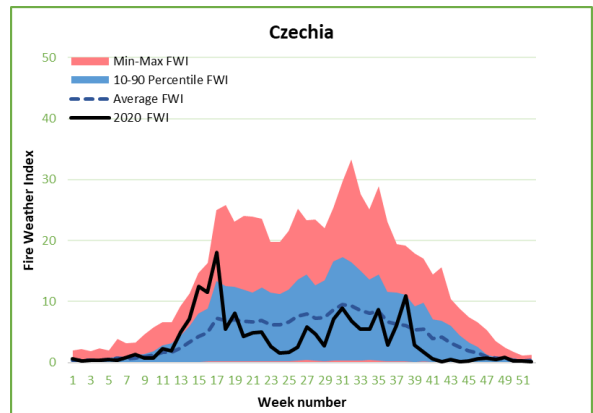
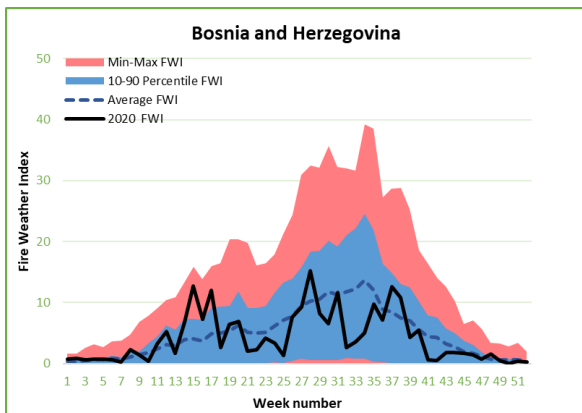
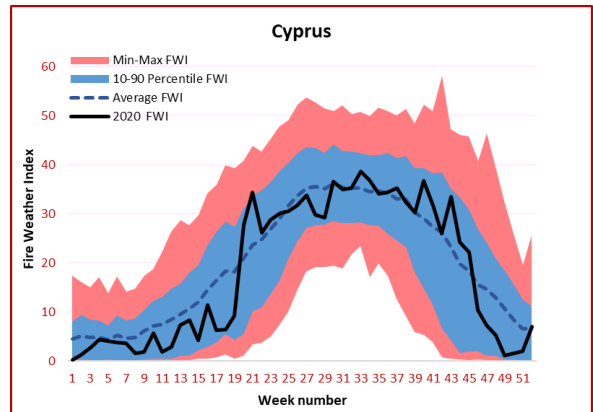
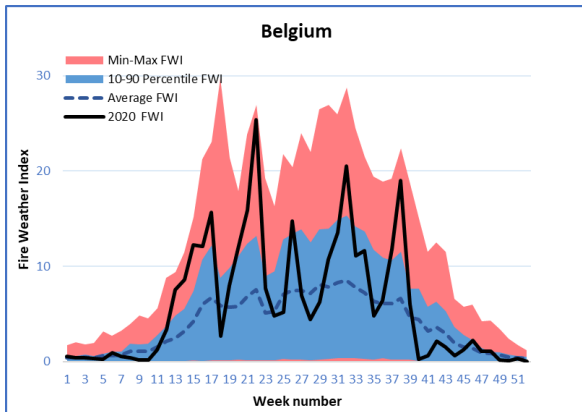
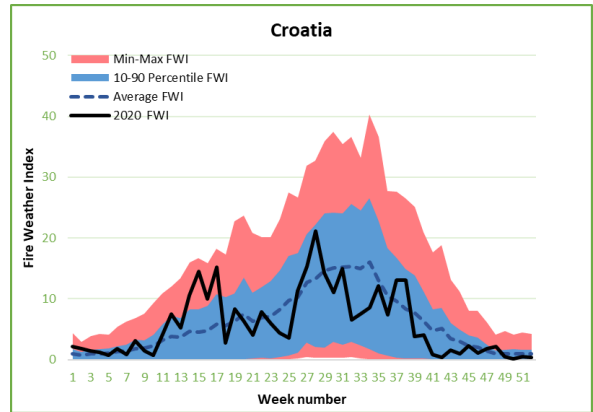
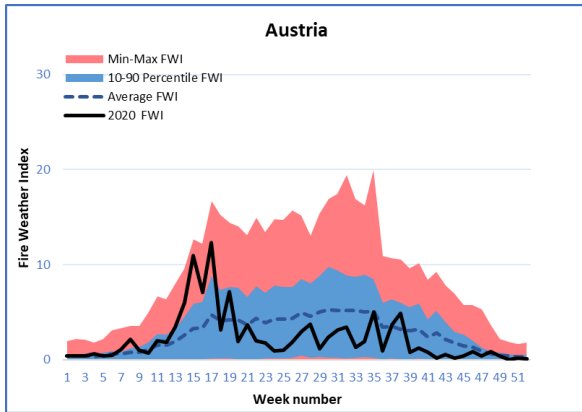
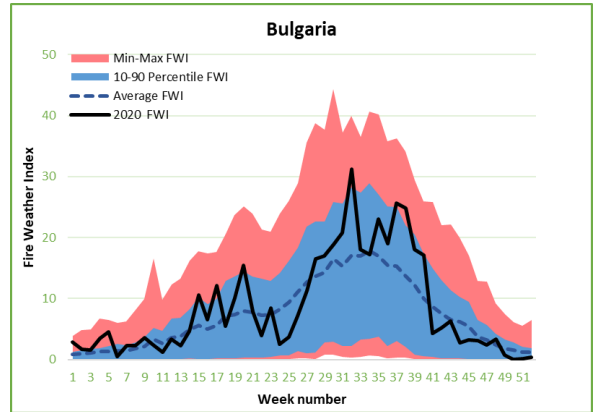
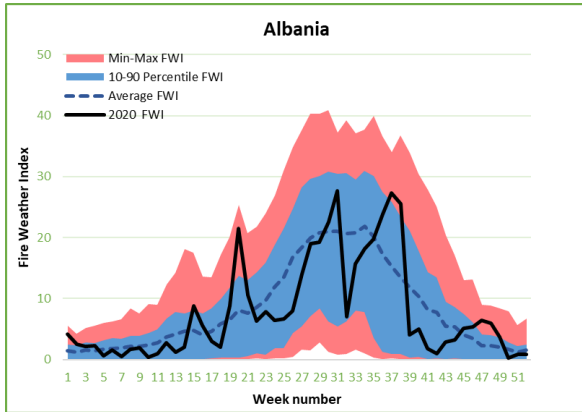
The blue area encloses the 10-90<sup>th</sup> percentiles: i.e. 80% of observations fall within this band.

The dotted line represents the 40-year average.

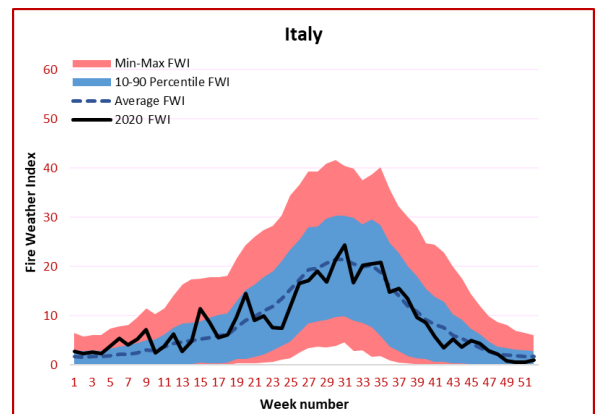
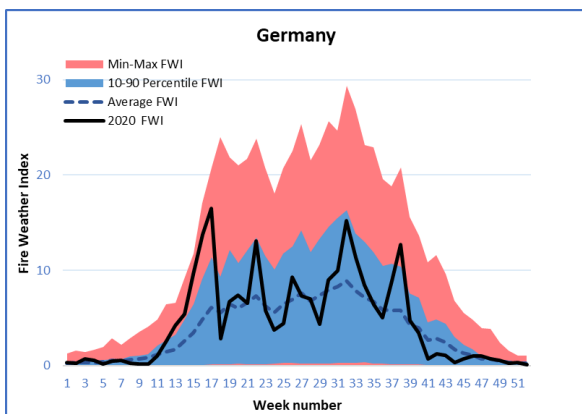
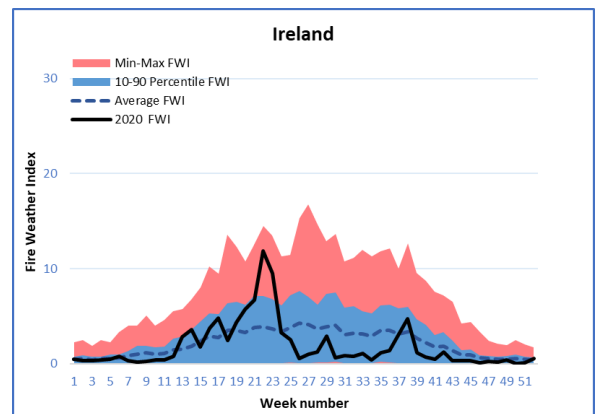
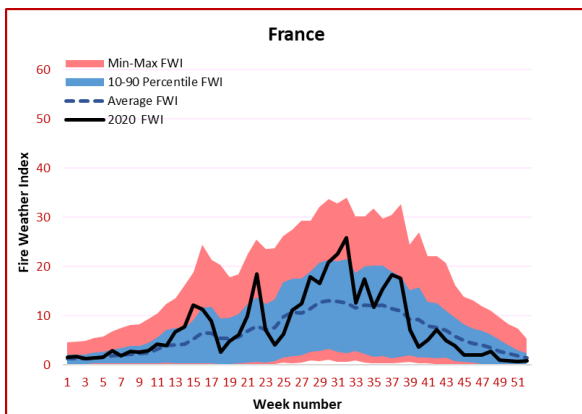
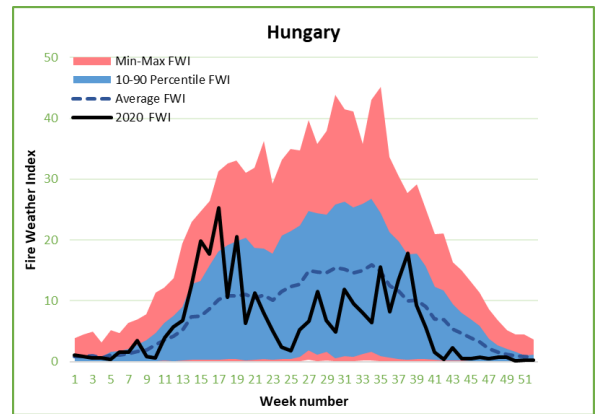
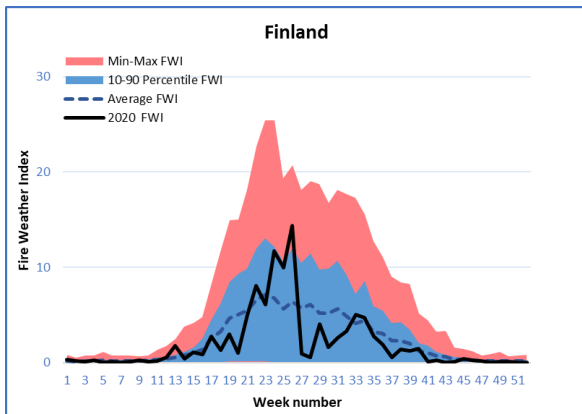
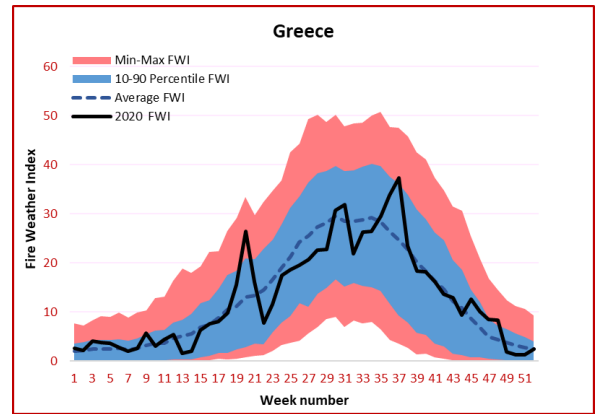
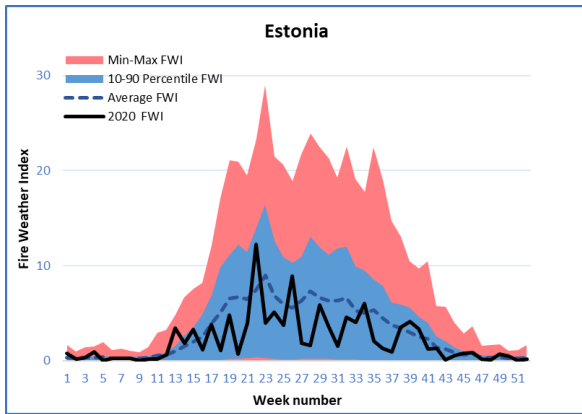
The solid black line shows the current year (2020).

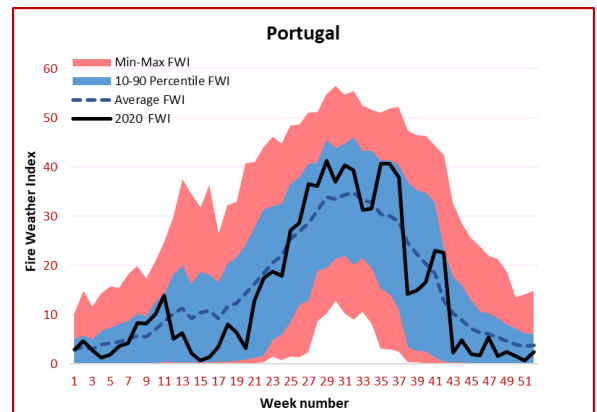
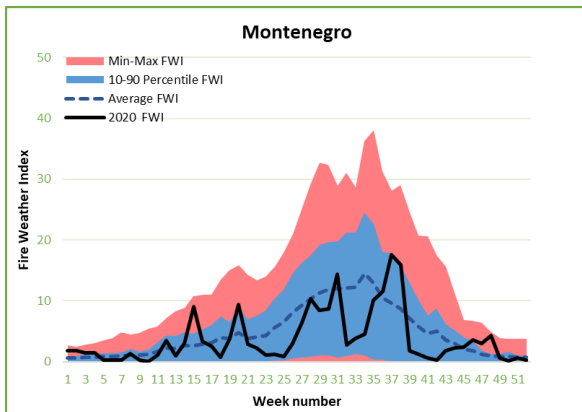
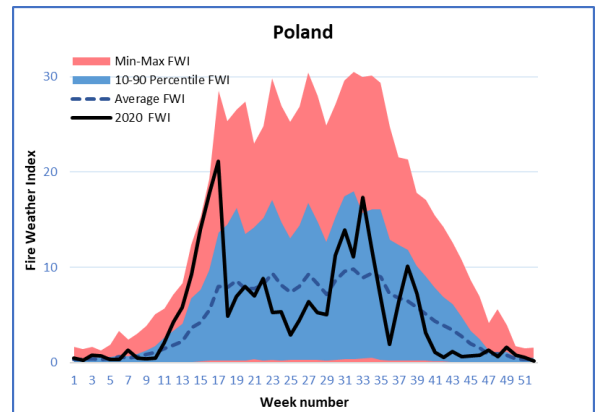
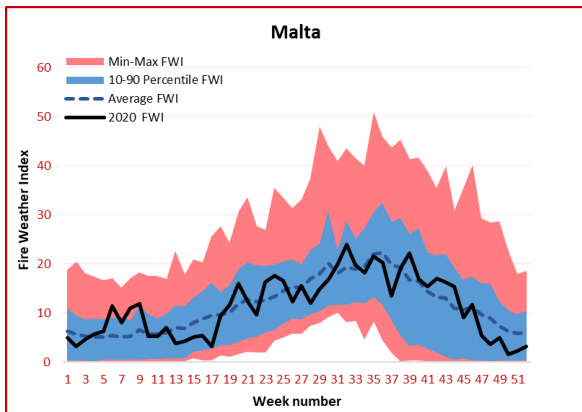
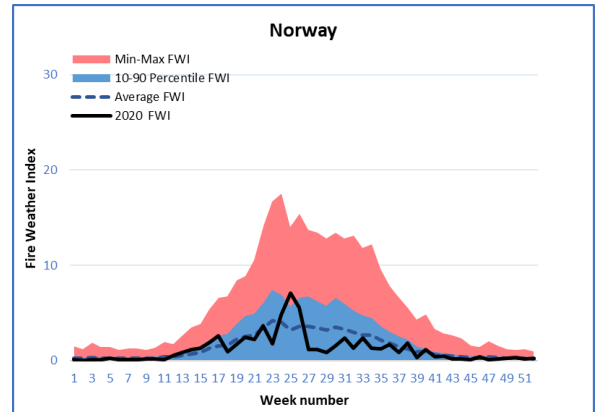
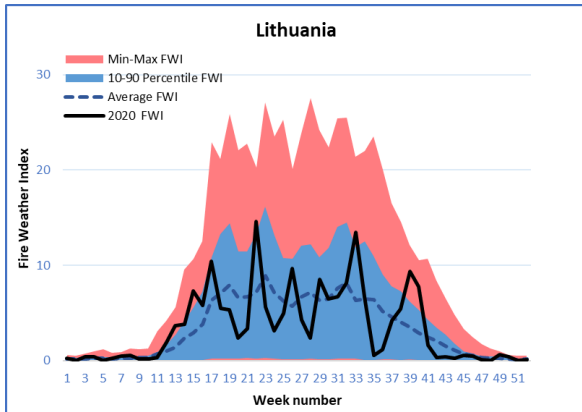
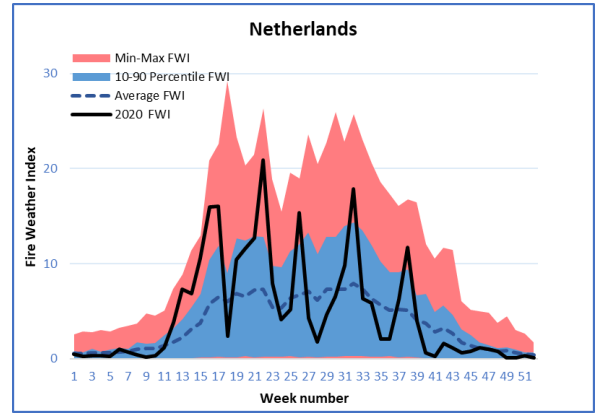
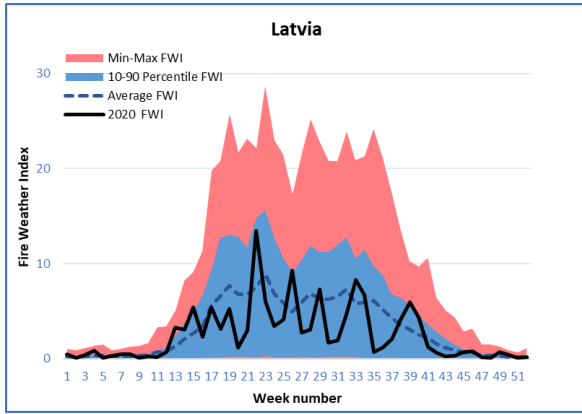
**NOTE:** Four colour-coded scales have been used to present the FWI: 0-30 for the most northern countries where fire danger rarely reaches high levels; 0-50 for central countries, 0-60 for the Mediterranean and Turkey, and 0-130 for the MENA countries.

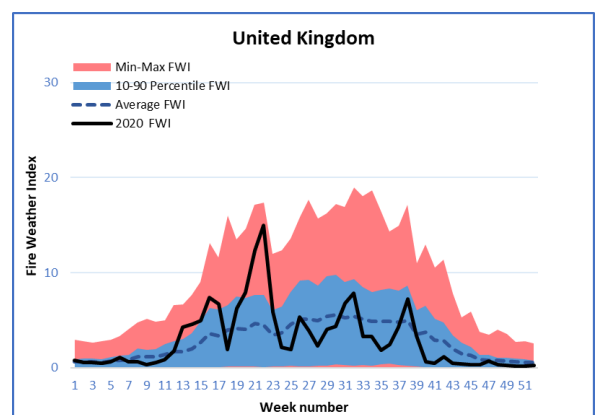
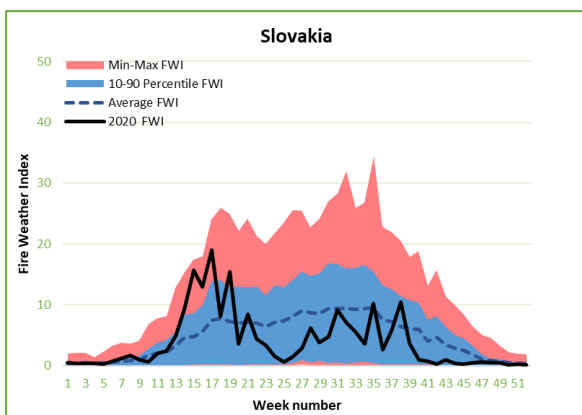
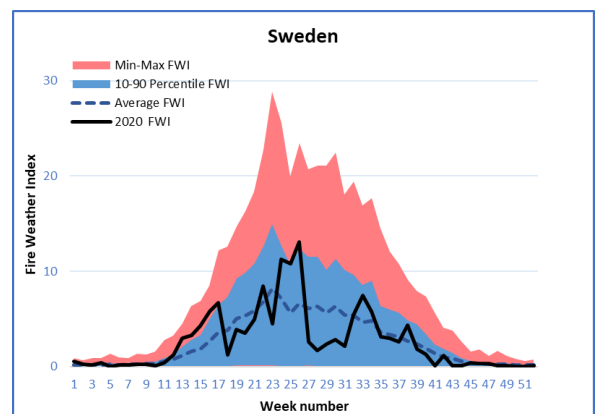
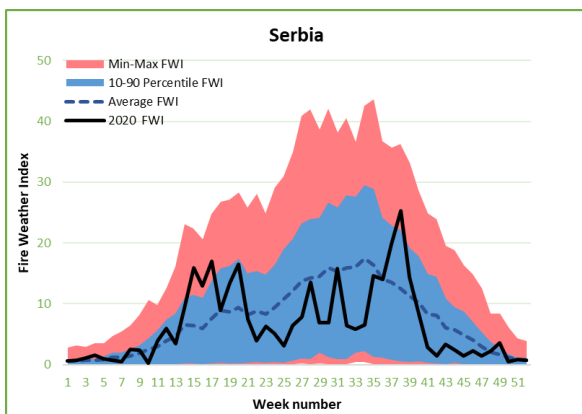
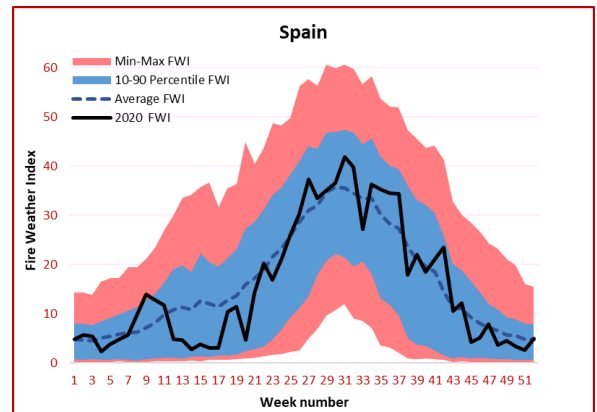
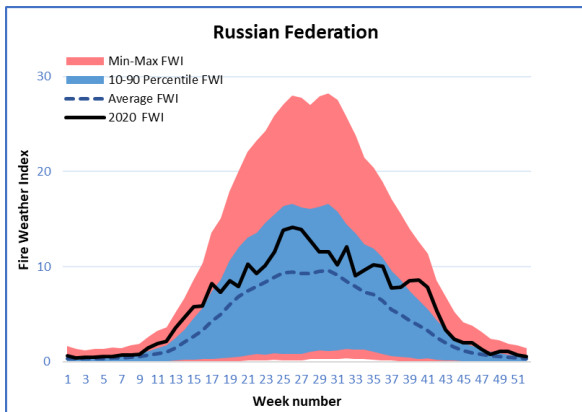
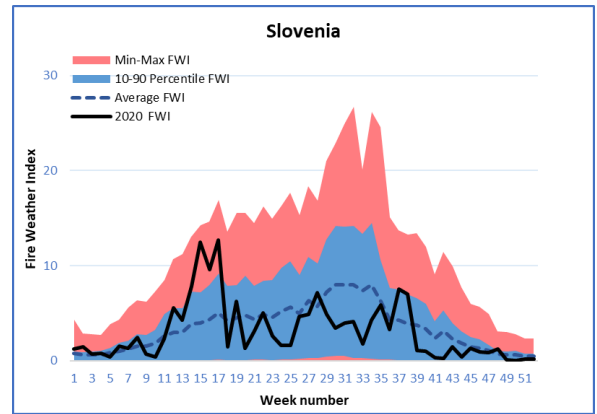
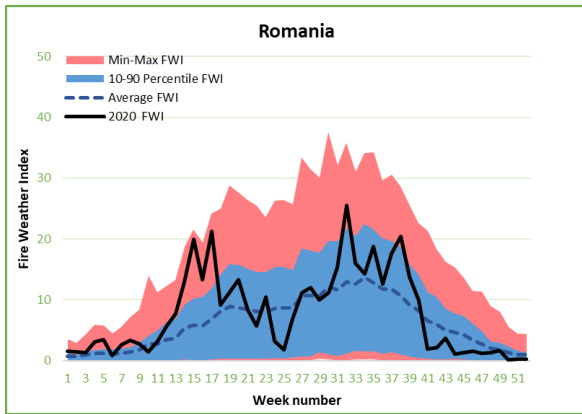
## European countries

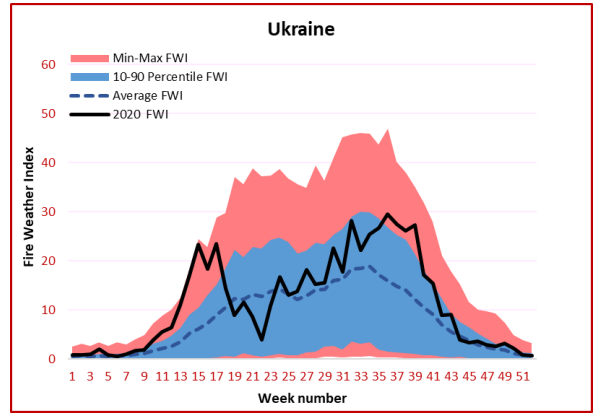
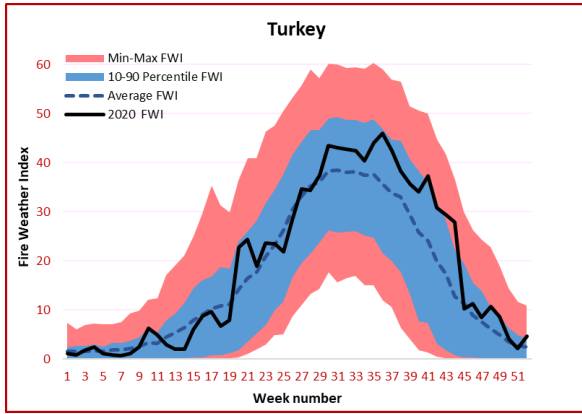




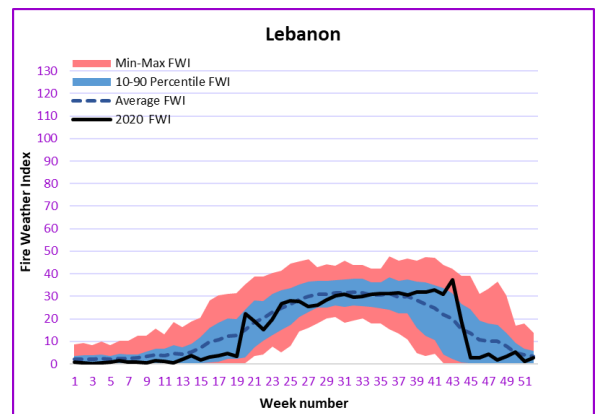
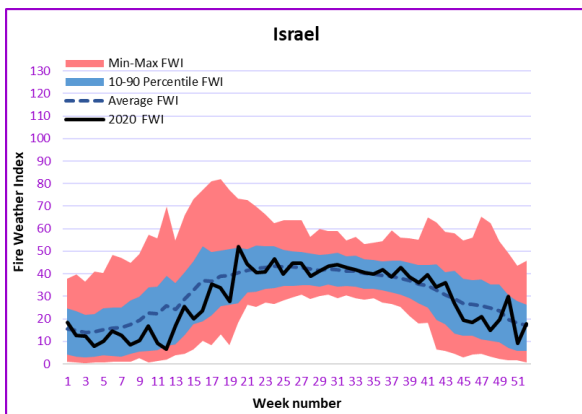
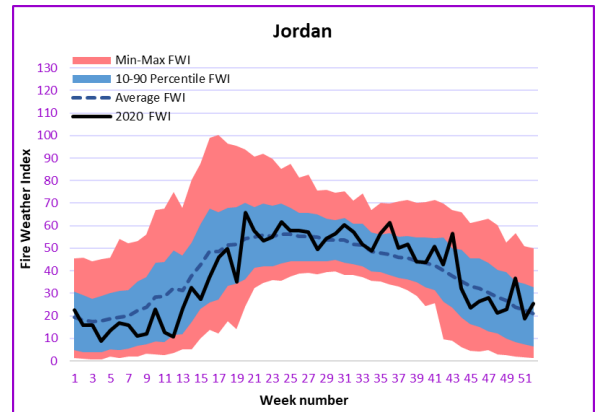
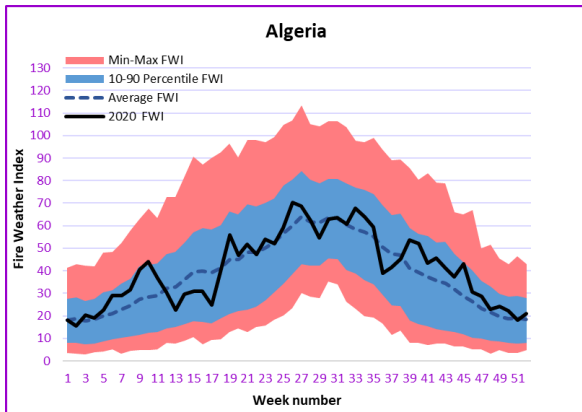


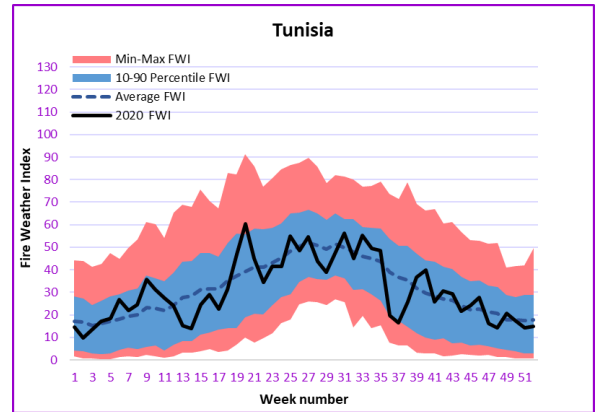
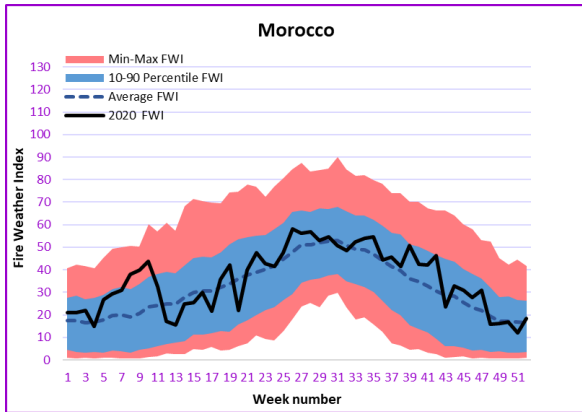
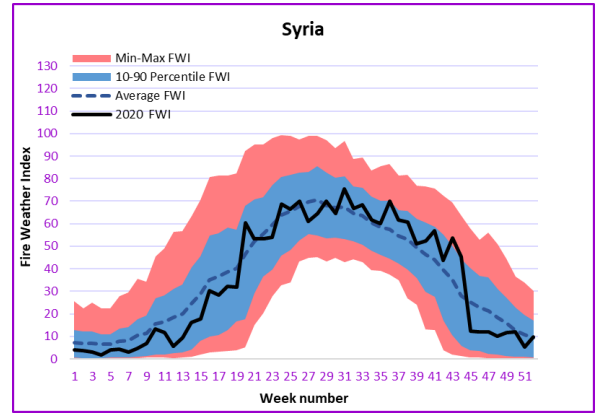
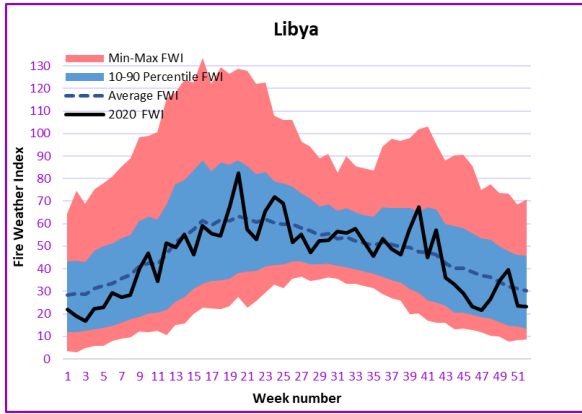






**MENA countries**





## 1.2 EFFIS Rapid Damage Assessment: 2020 results

The Rapid Damage Assessment module of EFFIS was set up to provide reliable and harmonized estimates of the areas affected by forest fires during the fire season. The methodology and the spatial resolution of the satellite sensor data used for this purpose allows all fires of about 30 ha or larger to be mapped. In order to obtain the statistics of the burnt area by land cover type the data from the European CORINE Land Cover 2016 (CLC) database were used. Therefore, the mapped burned areas were overlaid with the CLC data, making it possible to derive damage assessment results comparable for all the EU countries.

EFFIS Rapid Damage Assessment is based on the analysis of MODIS satellite imagery. The MODIS instrument is on board both the TERRA (morning pass) and AQUA (afternoon pass) satellites. MODIS data has 2 bands with spatial resolution of 250 metres (red and near-infrared bands) and 5 bands with spatial resolution of 500 metres (blue, green, and three short-wave infrared bands). Mapping of burnt areas is based mainly on the 250 metre bands, although the MODIS bands at 500 metres resolution are also used, as they provide complementary information that is used for improved burnt area discrimination. This type of satellite imagery allows detailed mapping of fires of around 30 ha or larger. Although only a fraction of the total number of fires is mapped (fires smaller than 30 ha are not mapped), the analysis of historical fire data has determined that the area burned by wildfires of this size represents in most cases the large majority of the total area burned. On average, the area burned by fires of at least 30 ha accounts for about 85% of the total area burnt every year in the Southern EU.

Since 2008, EFFIS has included Northern African countries in the mapping of burned area, following the agreement with FAO Silva Mediterranea, the FAO statutory body that covers the Mediterranean region.

The results for each of the countries affected by forest fires of over 30 ha are given in the following paragraphs in alphabetical order, followed by a section on the MENA countries.

The total area burned in 2020, as shown by the analysis of satellite imagery, is shown in Table 1. These figures may also include agricultural and urban areas that were burned during the forest fires. Figure 1 below shows the scars caused by forest fires during the 2020 season.

In 2020 fires of greater than 30 ha were observed in 39 countries and a total burnt area of 1 075 145 ha was mapped, around 35% more than in 2019. However, much of this increase comes from the inclusion of Ukraine in the figures for the first time.

Table 1. Areas burned by fires of at least 30 ha in 2020 estimated from satellite imagery.

Country	Area (Ha)	Number of Fires
Albania	19909	129
Algeria	114704	534
Austria	168	1
Bosnia and Herzegovina	100107	340
Bulgaria	8844	37
Croatia	27477	79
Cyprus	3421	19
France	14547	133
Germany	314	6
Greece	14915	88
Hungary	265	4
Ireland	3103	29
Israel	2824	13
Italy	53807	498
Jordan	163	1
Kosovo under UNSCR 1244	7016	58
Lebanon	2931	25
Libya	2615	8
Lithuania	43	1
Malta	34	1
Montenegro	39962	254
Morocco	7382	26
North Macedonia	2232	23
Norway	170	2
Palestinian Territory	106	2
Poland	5383	3
Portugal	62557	175
Romania	81668	328
Serbia	9041	80
Slovakia	85	1
Slovenia	168	2
Spain	61099	250
Sweden	769	6
Syria	46330	37
The Netherlands	822	2
Tunisia	11106	53
Turkey	99857	472
Ukraine	255408	209
United Kingdom	13793	75
<b>TOTAL</b>	<b>1075145</b>	<b>4004</b>

Summary	Total Area (Ha)
<b>EU27</b>	<b>339489</b>
<b>Other European countries</b>	<b>547495</b>
<b>Middle East and North Africa</b>	<b>118161</b>
<b>Natura2000 and other protected sites</b>	<b>136331</b>

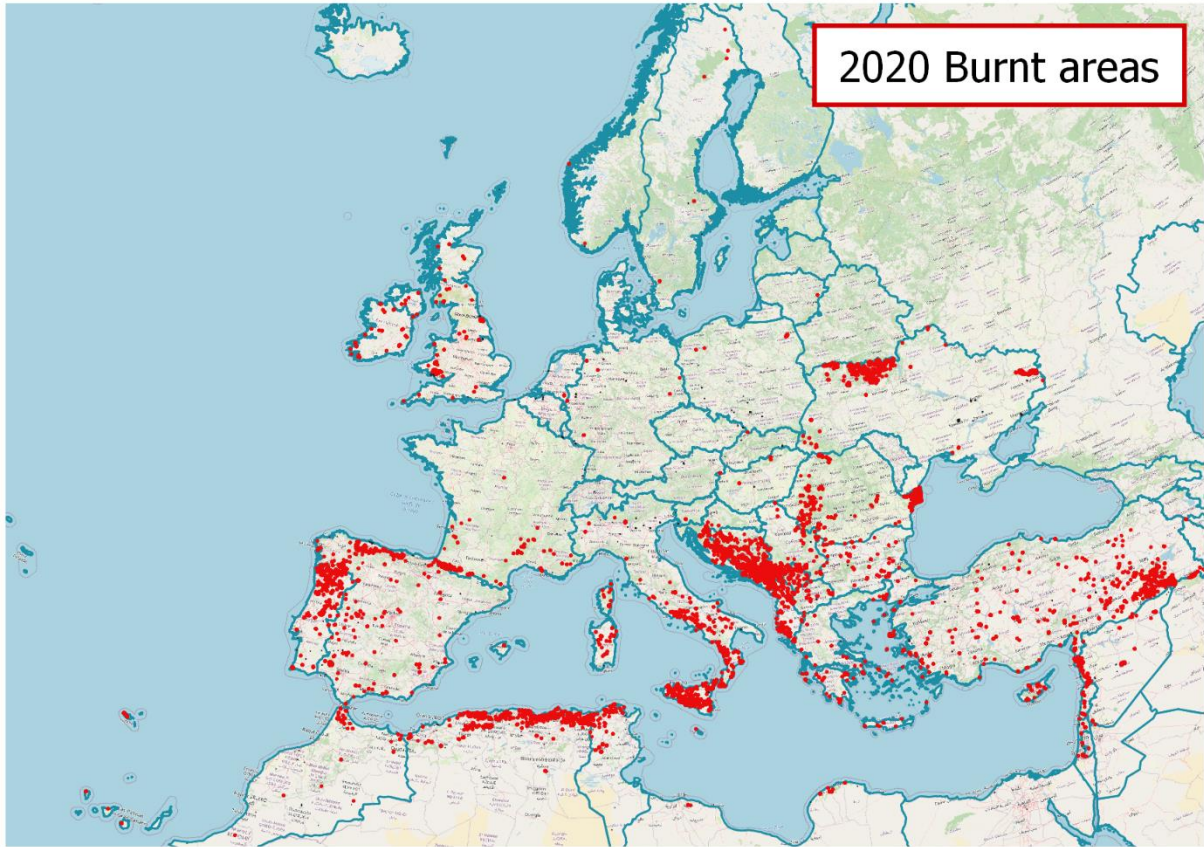


Figure 1. Burnt scars produced by forest fires during the 2020 fire season.

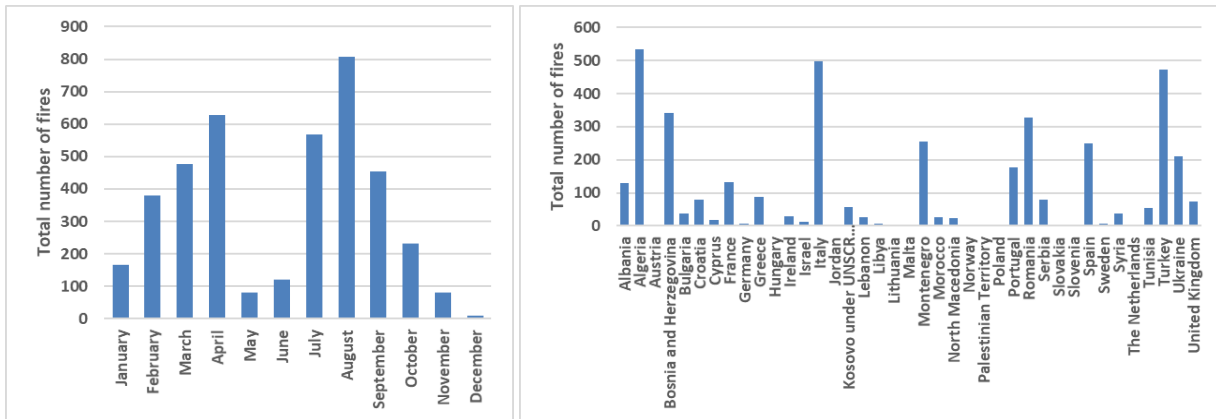


Figure 2. Total number of fires >30 ha by month and country in 2020.

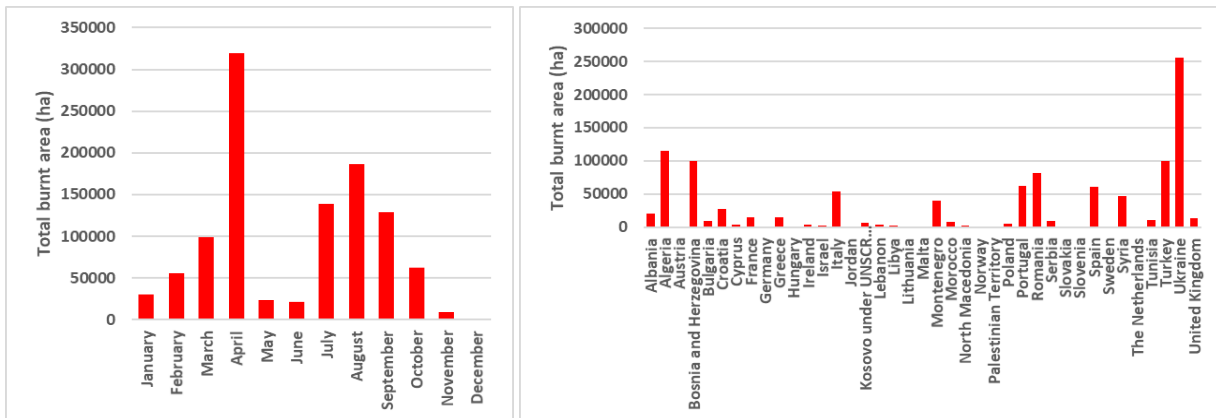


Figure 3. Total burnt area of fires >30 ha by month and country in 2020.

## Damage to Natura2000 and other protected sites

Of particular interest is the analysis of the damage caused by fires to the areas protected within the Natura2000 network, as they include habitats of especial interest which are home for endangered plant and animal species.

The category of Natura2000 areas only exists in the countries of the European Union. Information on other protected areas outside the EU is presented for those countries for which the information is available. The area burnt within the Natura2000 and other protected sites is presented below.

Country	Area (Ha)	% of Natura2000 Area	Number of Fires
Austria	168.0	0.013641	1
Bulgaria	4309.7	0.114679	26
Cyprus	529.2	0.325545	5
France	3810.3	0.055528	87
Germany	197.8	0.003609	4
Greece	5473.5	0.001529	48
Hungary	141.0	0.007079	1
Ireland	1655.2	0.181838	18
Italy	16551.1	0.28686	162
Netherlands	797.1	0.139147	2
Poland	5290.0	0.087067	1
Portugal	12267.8	0.642017	68
Romania	64554.2	1.51603	226
Slovenia	168.0	0.023541	2
Spain	15063.4	0.109808	118
Sweden	499.0	0.008766	2
<b>EU27 total</b>	<b>131475.3</b>		<b>771</b>
Albania	19.0	1.95533	1
Algeria	1855.7	1.114837	18
Lebanon	53.1	0.256273	1
Morocco	36.0	0.005021	1
United Kingdom	2891.4	0.164136	30
<b>Non-EU total</b>	<b>4855.2</b>		<b>51</b>
<b>TOTAL</b>	<b>136330.5</b>		<b>822</b>

The total burnt in protected areas in 2020 was 136 331 ha, slightly less than in 2019, but above the average of the past 9 years.

As in 2019, Romania was the most affected country and accounted for almost half of the total burnt area within Natura2000 sites, mostly occurring in the Delta Dunarii Nature Reserve. Italy and Spain account for 12% and 11% respectively of the total burnt area in Natura2000 sites, while Portugal's share was 9%.

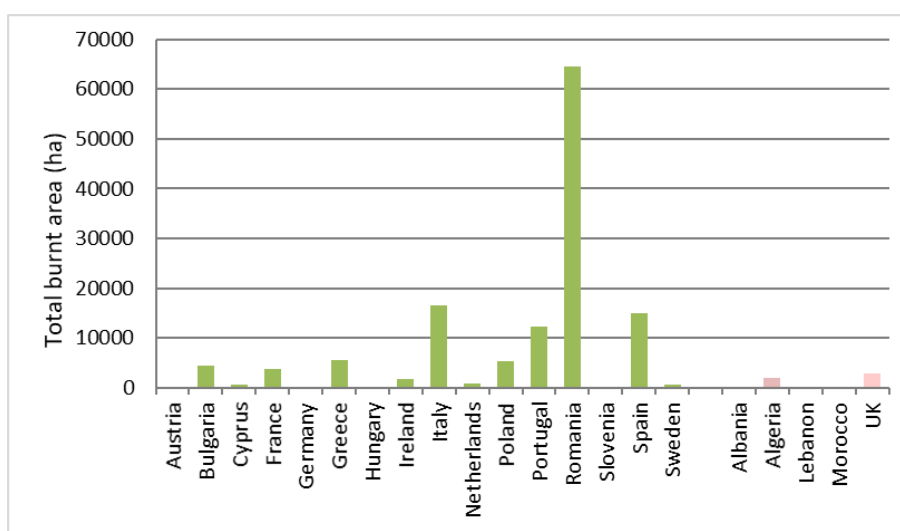
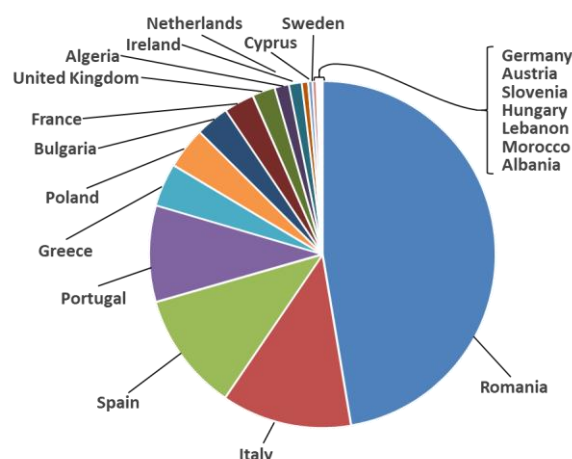


Figure 4. Burnt area in Natura2000 sites and other protected areas in 2020.



### Affected land cover types

In 2020, 50% of the total burnt area occurred in Forest and Other Wooded Land as identified by the CORINE Land Cover Type classification system (Figure 5, Figure 6).

This is slightly above the historic average proportion, which is around 45%, and is largely due to the inclusion of Ukraine in the figures this year (Figure 7).

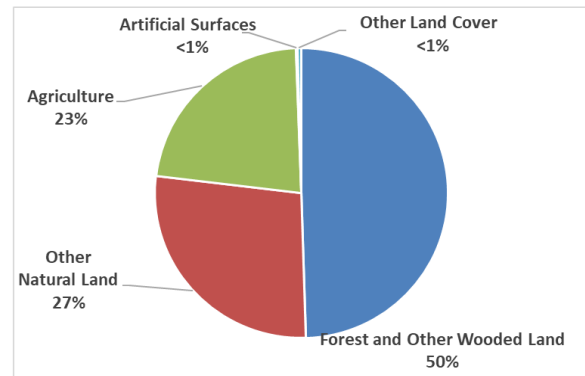


Figure 5. Proportions of land cover types affected in 2020 (all countries).

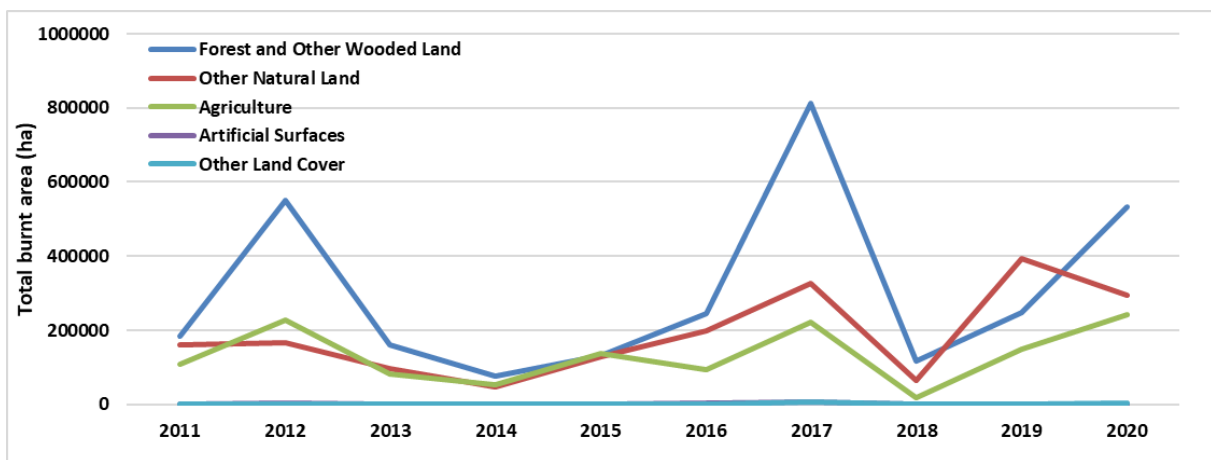


Figure 6. Total burnt area by land cover type 2011-2020 (all countries).

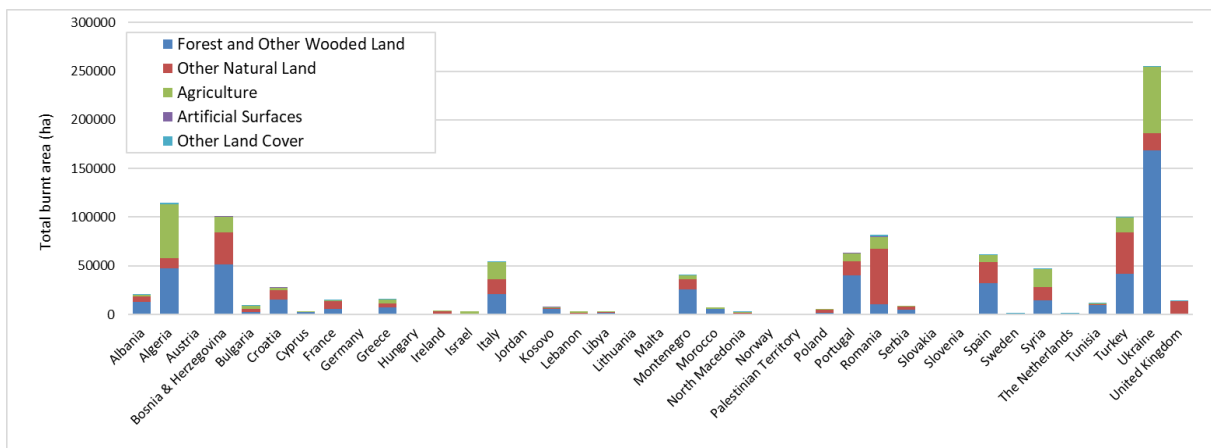


Figure 7. Burnt area in each country in 2020 by CORINE land class.

## European countries

In 2020, 20 of the EU27 countries were affected by fires of over 30 ha: (Austria, Bulgaria, Croatia, Cyprus, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Malta, the Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden), burning 339 489 ha in total. This is slightly above the amount recorded in 2019, particularly taking into account that the UK was not included in the EU figures this year.

Of this total, 130 857 ha occurred on Natura2000 sites, which amounts to 38% of the total. Half of all the Natura2000 land that burned in 2020 was in Romania, around the Danube Delta.

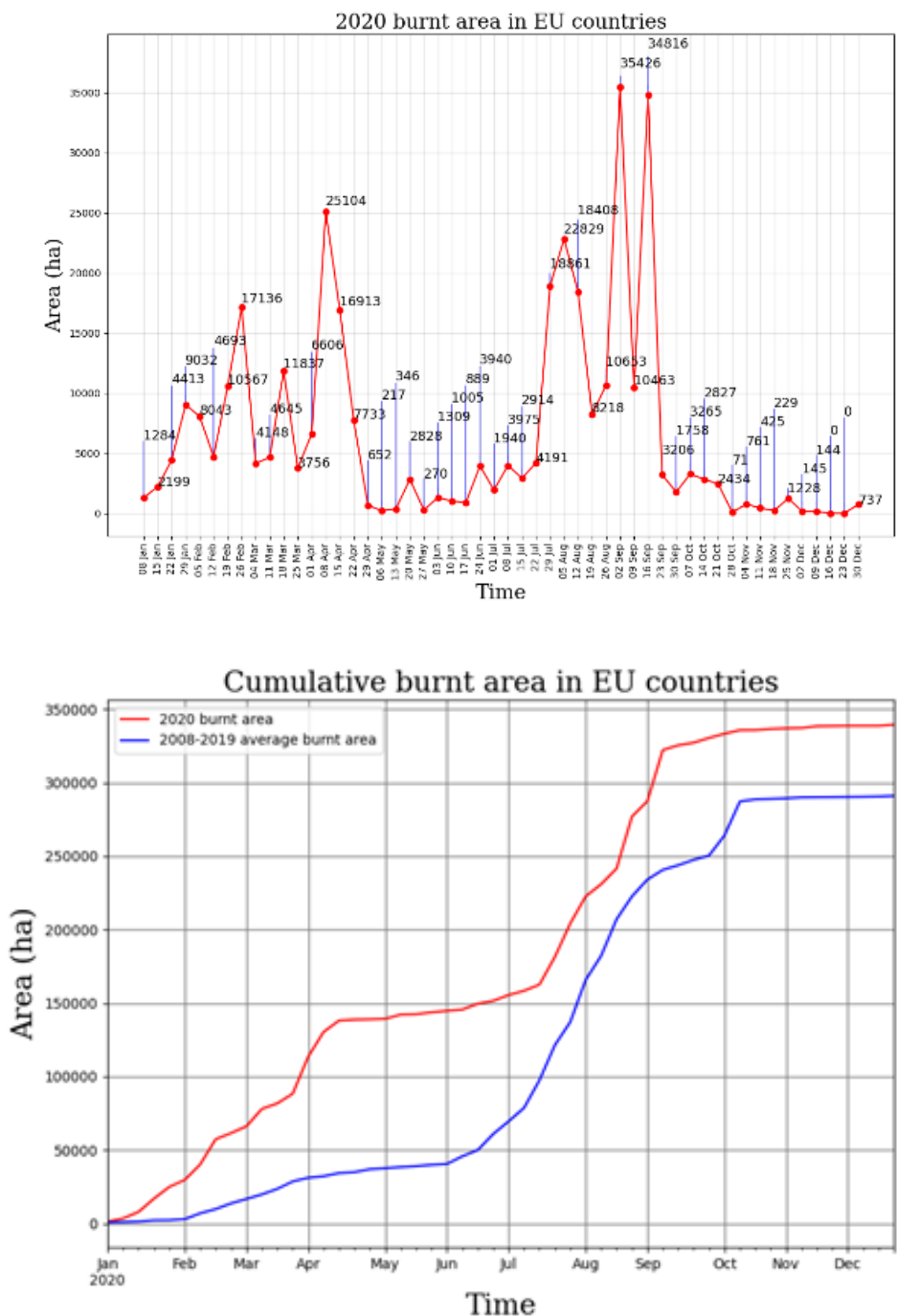


Figure 8. Burnt area weekly evolution and cumulative burnt area in 2020 (European Union countries).

## Mapped burnt area by country

The following section details the burnt areas mapped in each country in 2020. European countries (EU and non-EU) are listed alphabetically, followed by the MENA countries.

Burnt areas are split into different land cover types using the CLC 2016 database unless otherwise specified.

### 1.2.1 Albania

Apart from 2017, this was the worst fire season for Albania since 2012. There were 129 fires over 30 ha burning a total of 19 909 ha, with the worst of the damage occurring in July and September, although large fires were recorded from January to November. There was also one fire of 19 ha mapped on a protected site, amounting to 1.955% of the protected land cover in Albania. The most affected province was Kukës, where Albania's three largest fires were mapped, including one of over 2 000 ha in July. Forest and Other Wooded Land was the most affected land cover type, as shown in Table 2. Burnt area scars from the fires in 2020 can be seen in Figure 9.

Table 2. Distribution of burnt area (ha) in Albania by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	12719.20	63.89
Other Natural Land	5761.03	28.94
Agriculture	1360.88	6.84
Artificial Surfaces	28.95	0.15
Other Land Cover	38.94	0.2
<b>TOTAL</b>	<b>19909</b>	<b>100</b>

### 1.2.2 Austria

In April a fire of 168 ha affected a Natura2000 site. Most of the burnt area occurred in Other Natural Land.

Table 3. Distribution of burnt area (ha) in Austria by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Other Natural Land	156.28	93.02
Agriculture	7.81	4.65
Other Land Cover	3.91	2.33
<b>TOTAL</b>	<b>168</b>	<b>100</b>

### 1.2.3 Bosnia and Herzegovina

The total mapped burnt area in Bosnia was the highest for over a decade, and the third highest total recorded across the area covered by EFFIS. Large fires were mapped from January to September, but 80% of the damage occurred in March and April. In total there were 340 fires of over 30 ha, burning 100 107 ha. The largest fire of the season in Bosnia occurred in April in Bosansko Grahovo province, covering over 8 000 ha, and there were a further 44 fires over 500 ha mapped, of which 18 exceeded 1 000 ha. Figure 9 shows the locations of the large fires in 2020.

Table 4. Distribution of burnt area (ha) in Bosnia-Herzegovina by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	51700.45	51.65
Other Natural Land	32708.29	32.67
Agriculture	15668.29	15.65
Artificial Surfaces	29.97	0.03
<b>TOTAL</b>	<b>100107</b>	<b>100</b>

### 1.2.4 Bulgaria

After a severe year in 2019, the 2020 fire season in Bulgaria was close to average. 37 fires of over 30 ha burned 8 844 ha, less than two-thirds of 2019's total. Half of the damage occurred in August, in a large part because of a fire of over 2 000 ha that occurred in Haskovo province in this month. Two other fires burned more than 1 000 ha each.

Of the annual total, 4 310 ha occurred on Natura2000 sites, which was almost half of the total burnt area and 0.115% of Bulgaria's total Natura2000 land.

Table 5. Distribution of burnt area (ha) in Bulgaria by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	2416.73	27.33
Other Natural Land	3267.63	36.95
Agriculture	3092.65	34.97
Artificial Surfaces	54.99	0.62
Other Land Cover	12.00	0.14
<b>TOTAL</b>	<b>8844</b>	<b>100</b>

in protected areas. The scars from these mapped fires can be seen in Figure 9.

### 1.2.5 Croatia

The 2020 mapped burnt area total of 27 477 ha in Croatia was over twice the amount recorded in 2019, although still below the 67 342 ha mapped in 2017. 79 fires over 30 ha were mapped between January and September, but 80% of the damage occurred in April. 8 of the fires were over 500 ha, and the largest, in Šibensko-kninska županija province in April, was almost 6 000 ha in size. None of the fires were mapped

Table 6. Distribution of burnt area (ha) in Croatia by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	14970.90	54.49
Other Natural Land	9625.01	35.03
Agriculture	2867.09	10.43
Artificial Surfaces	14.01	0.05
<b>TOTAL</b>	<b>27477</b>	<b>100</b>

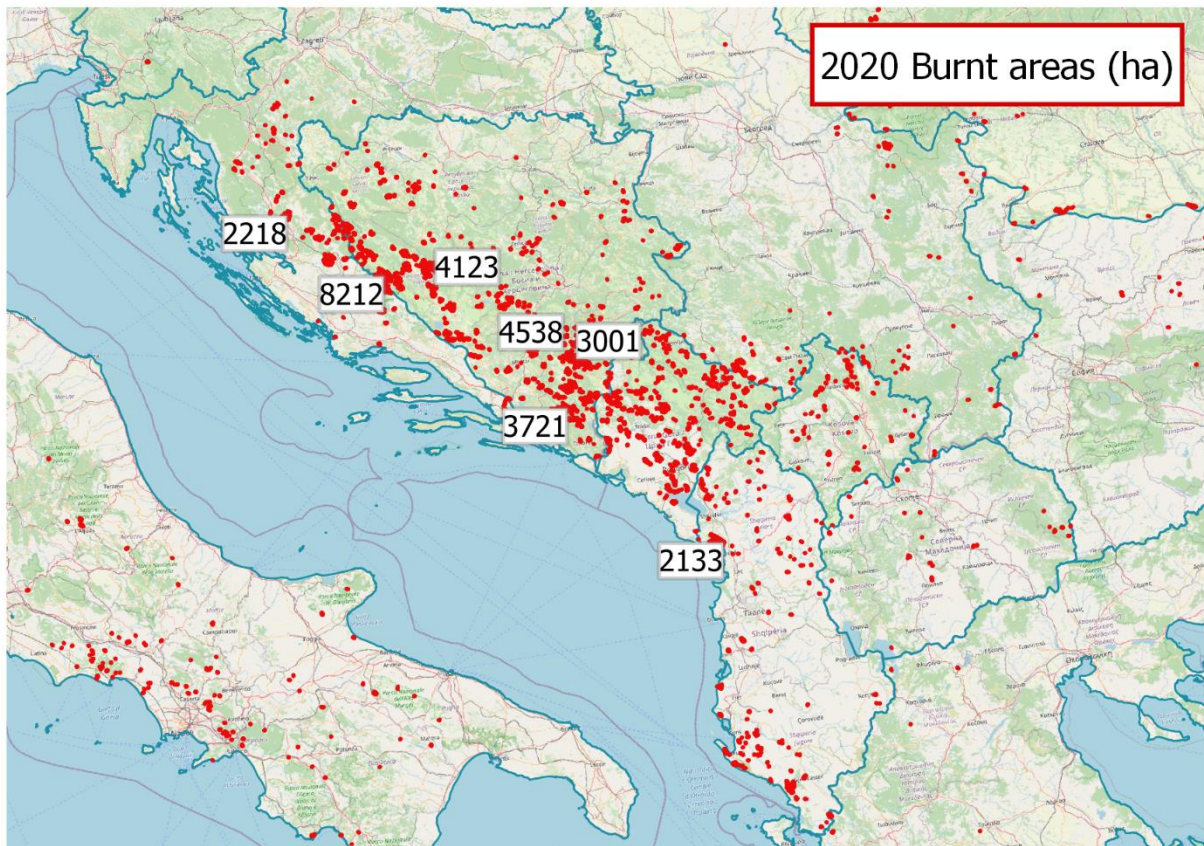


Figure 9. Burnt area scars in the Balkans in 2020. Largest fires are indicated in ha.

### 1.2.6 Cyprus

In Cyprus it was the worst fire season since 2016. There were 19 fires over 30 ha burning a total of 3 421 ha, half of which occurred in May, in particular because of a fire of over 1 000 ha which occurred near Morphou in the northern part of the island.

Of this total, 529 ha occurred on Natura2000 sites, around 15% of the total and 0.33% of the Natura2000 area of the country.

Table 7. Distribution of burnt area (ha) in Cyprus by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	2180.36	63.73
Other Natural Land	245.93	7.19
Agriculture	994.71	29.08

<b>TOTAL</b>	<b>3421</b>	<b>100</b>
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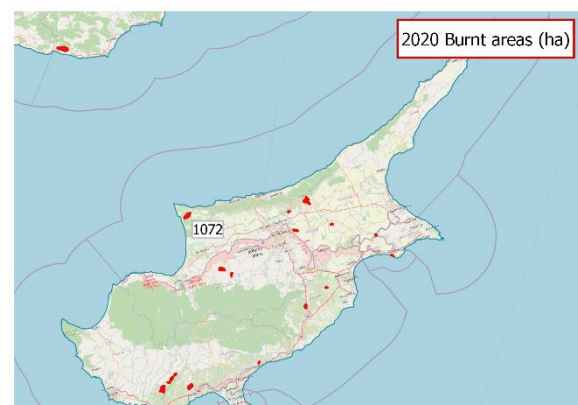


Figure 10. Burnt area scars in Cyprus in 2020. Largest fire indicated in ha.

### 1.2.7 France

The total burnt area in France was only a third of that mapped in 2019, but still above the long term average. Large fires occurred throughout the year, but two-thirds of the damage occurred early in the season in February, including 1 500 ha from two fires in Corsica.

Of the annual total, 3 810 ha were on Natura2000 sites (a big drop from the 26 641 ha recorded in 2019), which corresponds to 26% of the total area burned and 0.056% of the total Natura2000 areas in the country.

Table 8. Distribution of burnt area (ha) in France by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	5641.24	38.78
Other Natural Land	8383.47	57.63
Agriculture	502.31	3.45
Artificial Surfaces	16.98	0.12
Other Land Cover	3.00	0.02
<b>TOTAL</b>	<b>14547</b>	<b>100</b>

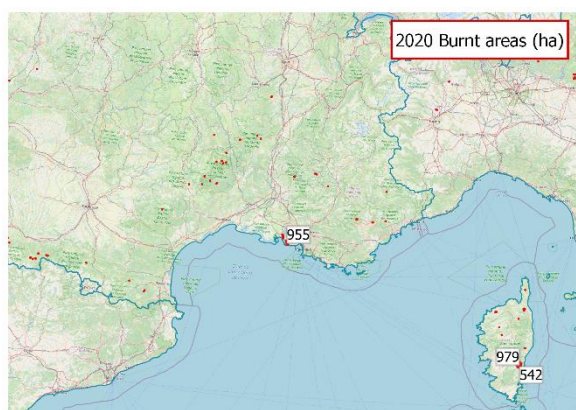


Figure 11. Burnt area scars in southern France and Corsica in 2020. Largest fires are indicated in ha.

### 1.2.8 Germany

After two severe years in 2018 and 2019, the 2020 fire season on Germany was mild. Six fires over 30 ha were mapped, 4 of them between January and May, but the last two occurred later in the season in September.

Of the annual total, 198 ha occurred in Natura2000 sites, amounting to 63% of the total and 0.004% of the Natura2000 area in the country.

Table 9. Distribution of burnt area (ha) in Germany by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	65.00	20.7
Other Natural Land	249.00	79.3
<b>TOTAL</b>	<b>314</b>	<b>100</b>

### 1.2.9 Greece



Figure 12. Burnt area scars in Greece in 2020. Largest fires are indicated in ha.

The fire season in Greece was slightly worse than the previous two years, although still below the long-term average. Three-quarters of the damage occurred between July and September, but there were fires from February to December. The largest fire of the year occurred in Corinthia in July, and over 3 500 ha were affected. Of the total, 5 474 ha occurred on Natura2000 sites, amounting to 37% of the total and 0.002% of the total Natura2000 area of Greece. Table 10 presents the distribution of the mapped burnt area by land cover type. Figure 12 shows the burnt area scars in Greece.

Table 10. Distribution of burnt area (ha) in Greece by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	7342.62	49.23
Other Natural Land	3707.27	24.86
Agriculture	3815.16	25.58
Artificial Surfaces	41.96	0.28
Other Land Cover	7.99	0.05
<b>TOTAL</b>	<b>14915</b>	<b>100</b>

### 1.2.10 Hungary

The season was light in Hungary, with only 4 fires over 30 ha mapped. The largest fire, 141 ha on a Natura2000 site in September, accounted for over half of the total 265 ha mapped during the year and 0.007% of the Natura2000 area in the country.

Table 11. Distribution of burnt area (ha) in Hungary by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	25.58	9.65
Other Natural Land	192.36	72.59
Agriculture	46.04	17.37
Artificial Surfaces	1.02	0.39
<b>TOTAL</b>	<b>265</b>	<b>100</b>

### 1.2.11 Ireland

The fire season in Ireland was similar to that of the last two years, with 3 103 ha affected by 29 fires of over 30 ha. 53% of the burnt area (1 655 ha) was recorded in Natura2000 sites, practically the same amount as in 2019, which corresponds to 0.182% of the total Natura2000 land in the country. The most affected land type was Other Natural Land, as shown in Table 12.

Table 12. Distribution of burnt area (ha) in Ireland by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	402.00	12.96
Other Natural Land	2672.00	86.11
Agriculture	29.00	0.93
<b>TOTAL</b>	<b>3103</b>	<b>100</b>

### 1.2.12 Italy

Italy was the second placed country for number of fires mapped (after Algeria), and the most affected European country. However, it was only the fourth most affected EU country in terms of burnt area, as many of the fires were relatively small.

This resulted in a total burnt area around 30% higher than in 2019 and just above the long-term average. However, there were 7 fires of over 500 ha, the largest of which burned over 3 000 ha in Trapani province at the end of August.

Table 13. Distribution of burnt area (ha) in Italy by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	20617.65	38.32
Other Natural Land	15840.05	29.44
Agriculture	17087.43	31.76
Artificial Surfaces	246.88	0.46
Other Land Cover	14.99	0.03
<b>TOTAL</b>	<b>53807</b>	<b>100</b>

Fires occurred throughout the year, but two-thirds of the damage occurred in the summer months, when the largest fires of the year were mapped in Sicily and Sardinia.

Of the year's total, 16 551 ha occurred on Natura2000 sites, corresponding to 31% of the total and 0.287% of the Natura2000 land in Italy. Table 13 presents the distribution of the mapped burnt area by land cover type.

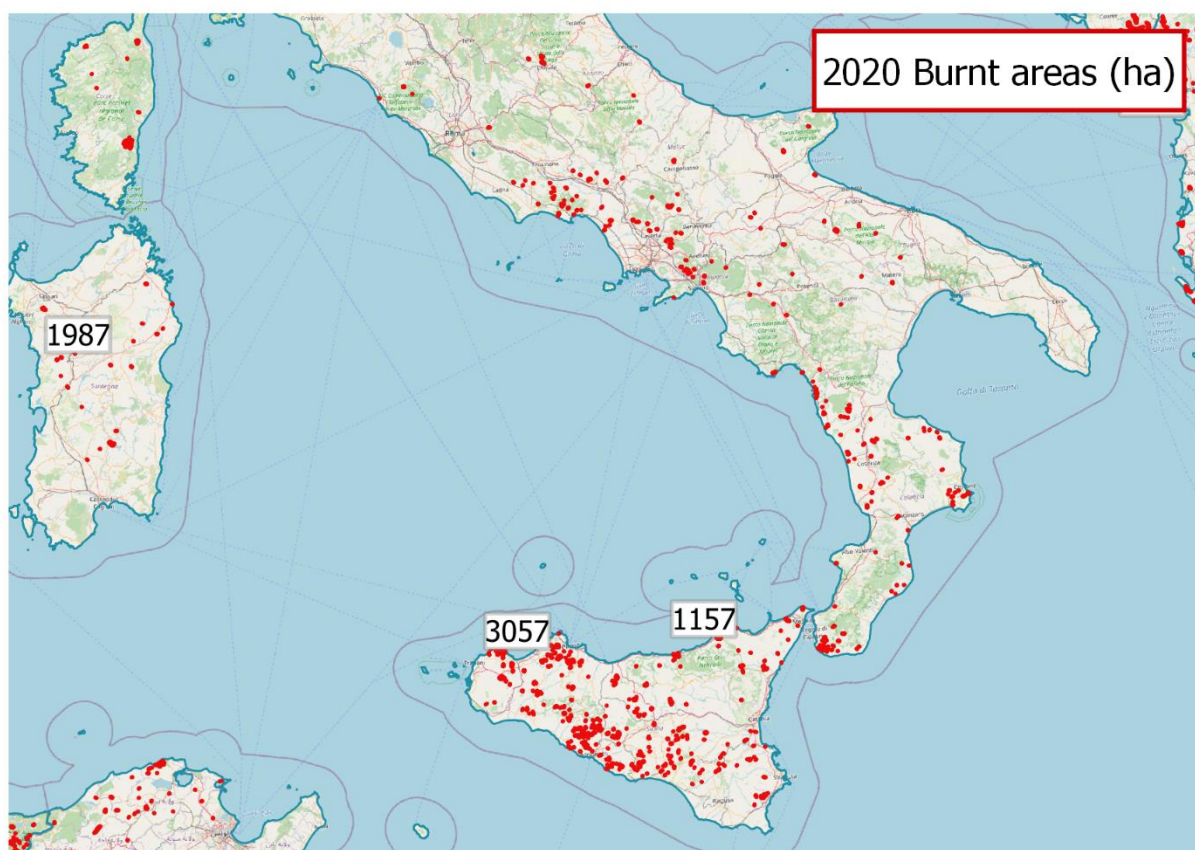


Figure 13. Mapped burnt area scars in southern Italy and Sicily in 2020. Largest fires are indicated in ha.

### 1.2.13 Kosovo under UNSCR 1244

Kosovo had a worse fire season than normal, although it was not as extreme as in 2019. 58 fires over 30 ha burned a total of 7 016 ha, mostly in March and April, although fires were mapped throughout the year. One fire exceeded 500 ha. Figure 9 above shows the mapped burnt area scars.

Table 14. Distribution of burnt area (ha) in Kosovo by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	5555.42	79.18
Other Natural Land	1102.69	15.72
Agriculture	352.90	5.03
Artificial Surfaces	5.00	0.07
<b>TOTAL</b>	<b>7016</b>	<b>100</b>

### 1.2.14 Lithuania

A fire of 43 ha was mapped in Lithuania in August, affecting Forest and Other Wooded Land. No Natura2000 land was affected.

### 1.2.15 Malta

Malta rarely has fires large enough for EFFIS to map. However, a fire of 34 ha was mapped in June.

Table 15. Distribution of burnt area (ha) in Malta by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	10.00	29.41
Agriculture	11.00	32.35
Artificial Surfaces	13.00	38.24
<b>TOTAL</b>	<b>34</b>	<b>100</b>

### 1.2.16 Montenegro

The fire season in Montenegro was the worst since 2017 and significantly above the long term average. Fires were mapped from January to November, with most of the damage occurring in March and April. There were 16 fires of more than 500 ha, and the largest was mapped at over 1 000 ha in April. Figure 9 above shows the mapped burnt area scars.

Table 16. Distribution of burnt area (ha) in Montenegro by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	25812.08	64.59
Other Natural Land	10506.74	26.29
Agriculture	3641.18	9.11
Other Land Cover	2.00	0.01
<b>TOTAL</b>	<b>39962</b>	<b>100</b>

### 1.2.17 The Netherlands

In the Netherlands two fires burned a total of 822 ha, two-thirds of which occurred in Other Natural Land. 97% of the mapped burnt area occurred on

Natura2000 sites, amounting to 0.139% of the Natura2000 area in the country.

Table 17. Distribution of burnt area (ha) in the Netherlands by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	242.82	29.54
Other Natural Land	532.41	64.77
Agriculture	11.94	1.45
Other Land Cover	34.83	4.24
<b>TOTAL</b>	<b>822</b>	<b>100</b>

### 1.2.18 North Macedonia

After an extreme year in 2019, the 2020 fire season was quiet in North Macedonia. A total of 2 232 ha was mapped from 23 fires, mostly in between April and July, although one fire of almost 250 ha was mapped in November. The burnt area scars are displayed in Figure 9 above.

Table 18. Distribution of burnt area (ha) in North Macedonia by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	1039.07	46.55
Other Natural Land	750.33	33.62
Agricultural Areas	418.62	18.76
Other Land Cover	23.98	1.07
<b>TOTAL</b>	<b>2232</b>	<b>100</b>

### 1.2.19 Norway

Two fires over 30 ha were mapped in Norway; one in April and a second one in May, burning a total of 170 ha. Over 80% of the damage occurred on Other Natural Land, as shown in Table 19.

Table 19. Distribution of burnt area (ha) in Norway by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	29.00	17.06
Other Natural Land	140.00	82.35
Other Land Cover	1.00	0.59
<b>TOTAL</b>	<b>170</b>	<b>100</b>

### 1.2.20 Poland

Only two fires over 30 ha were mapped in Poland. However, one that occurred in April was among the largest mapped in Europe in the year and the largest in a protected area, covering 5 290 ha in a Natura2000 site in Suwalski province in the north of the country. This amounts to 0.087% of the Natura2000 area of the country.

Table 20. Distribution of burnt area (ha) in Poland by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	1423.74	26.45
Other Natural Land	3138.42	58.3
Agriculture	820.85	15.25
<b>TOTAL</b>	<b>5383</b>	<b>100</b>

### 1.2.21 Portugal

The 2020 fire season in Portugal resulted in around twice as much burnt area recorded compared with the past two years. However, the total of 62 557 ha from 175 fires over 30 ha was still well below the long term average. Fires were mapped in every month of the year, but almost 90% of the damage occurred in the summer months July-September. Portugal's largest fire of the year (and the second largest mapped in a European country in 2020) occurred in Beira Baixa in September and burned over 15 000 ha. There were 20 other fires over 500 ha.

The mapped burnt areas in Portugal in 2020 can be seen in Figure 14.

Of the mapped total, 12 268 ha occurred on Natura2000 sites, corresponding to 19.6% of the total area burnt, and 0.642 % of the total Natura2000 areas in Portugal.

The distribution of the mapped burnt area by land cover type is shown in Table 21.

Table 21. Distribution of burnt area (ha) in Portugal by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	40002.52	63.95
Other Natural Land	14448.38	23.1
Agriculture	7919.11	12.66
Artificial Surfaces	186.98	0.3
<b>TOTAL</b>	<b>62557</b>	<b>100</b>

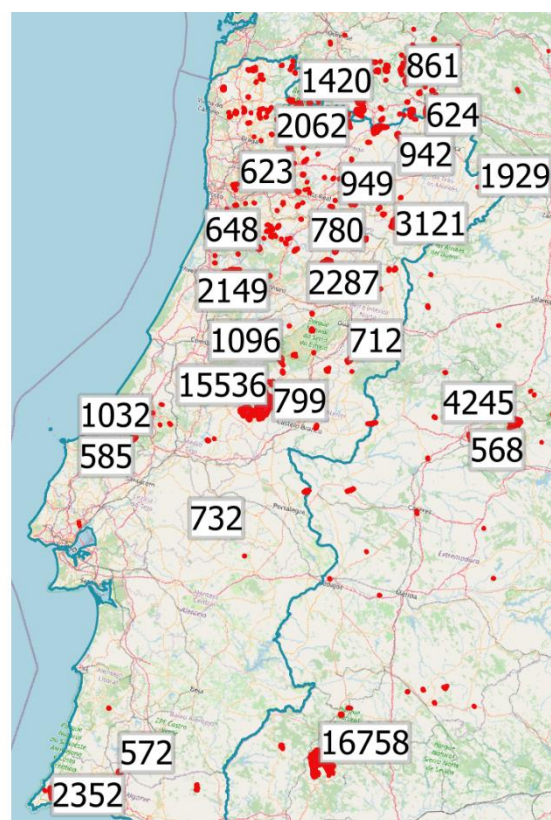


Figure 14. Burnt area scars in Portugal in 2020. Largest fires are indicated in ha.

### 1.2.22 Romania

After a bad 2019 fire season, 2020 was even worse in Romania. Similar to last year, much of the damage was early in the season, with over 90% occurring between January and April. Tulcea was again the worst affected region, with 28 of the 35 fires over 500 ha occurring there. The total burnt area mapped from fires over 30 ha was 81 668 ha from 328 fires, making Romania the worst affected EU country for the second year. Over 90% of the damage occurred between January and April in Natura2000 sites in Tulcea province on the east of the country, including one of over 3000 ha. In total there were 35 fires mapped over 500 ha, of which 28 occurred in Tulcea.

In total, 64 554 ha (79%) of the mapped burnt area was on Natura2000 sites, a similar proportion to 2019. This represents 1.52% of the total Natura2000 area of Romania, and was again the highest loss of protected land in Europe in 2020. Table 22 presents the distribution of the mapped burnt area by land cover type.

Table 22. Distribution of burnt area (ha) in Romania by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	10285.58	12.59
Other Natural Land	57172.81	70.01
Agriculture	12325.68	15.09
Artificial Surfaces	89.09	0.11
Other Land Cover	1794.85	2.2



<b>TOTAL</b>	<b>81668</b>	<b>100</b>
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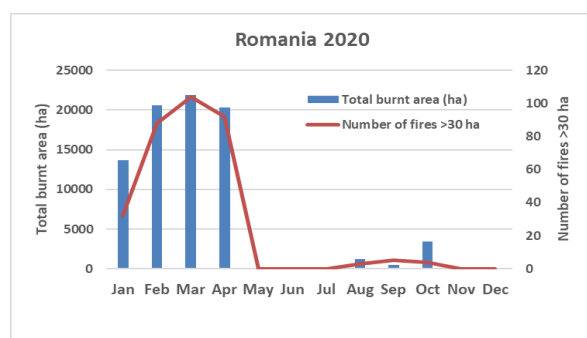


Figure 15. Monthly mapped burnt area and number of fires in Romania 2020.

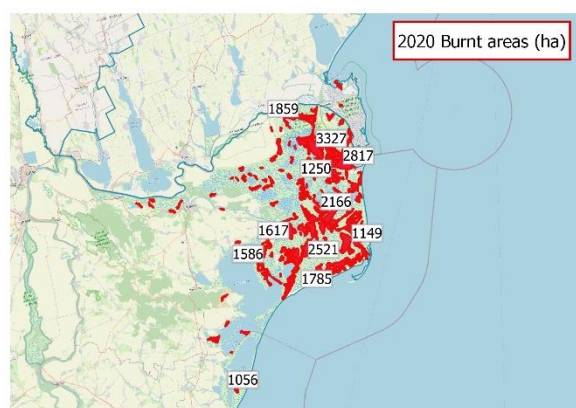


Figure 16. Burnt area scars in the Danube region in Romania. Largest fires are shown in ha.

### 1.2.23 Serbia

The fire season in Serbia was worse than average, although only around half the burnt area was recorded compared with the extreme season of 2019. 80 fires over 30 ha resulted in a total burnt area of 9 041 ha, with almost 85% of it occurring in March and April. Two of the fires exceeded 750 ha: one in Kučevo municipality in April and the other in Sjenica in March.

Table 23. Distribution of burnt area (ha) in Serbia by land cover type in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	4903.03	54.23
Other Natural Land	2941.62	32.54
Agriculture	1196.35	13.23
<b>TOTAL</b>	<b>9041</b>	<b>100</b>

### 1.2.24 Slovakia

In April a fire of 85 ha was mapped, 98% of it on Forest and Other Wooded Land. No Natura2000 land was affected.

### 1.2.25 Slovenia

Two fires mapped in Slovenia in January resulted in a total burnt area of 168 ha. Both were in Natura2000 areas, amounting to 0.023% of the Natura2000 area of the country.

Table 24. Distribution of burnt area (ha) in Slovenia by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	21.25	12.65
Other Natural Land	146.75	87.35
<b>TOTAL</b>	<b>168</b>	<b>100</b>

### 1.2.26 Spain

The 2020 fire season in Spain resulted in a total burnt area a little lower than that recorded in 2019, and very close to the long term average. It was the third most affected EU country in terms of burnt area, after Romania and Portugal, and it was also the third most affected regarding loss of protected areas. Fires were mapped in every month of the year, but almost 50% of the damage occurred in August.

The largest fire of the year (also the largest mapped in a European country) was in Almonaster la Real in Huelva province, which covered over 16 500 ha. There were 7 other fires over 1 000 ha and a 12 over 500 ha.

Of the total burnt area mapped in 2020, 15 063 ha occurred on Natura2000 sites, corresponding to 25% of the total area burned, and 0.110% of the Natura2000 areas in Spain. Table 25 presents the distribution of the mapped burnt area by land cover type. The most noticeable fires in Spain during 2020 are shown in Figure 17.

Table 25. Distribution of burnt area (ha) in Spain by land cover type in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	32352.18	52.95
Other Natural Land	21148.08	34.61
Agriculture	7100.70	11.62
Artificial Surfaces	228.02	0.37
Other Land Cover	270.03	0.44
<b>TOTAL</b>	<b>61099</b>	<b>100</b>

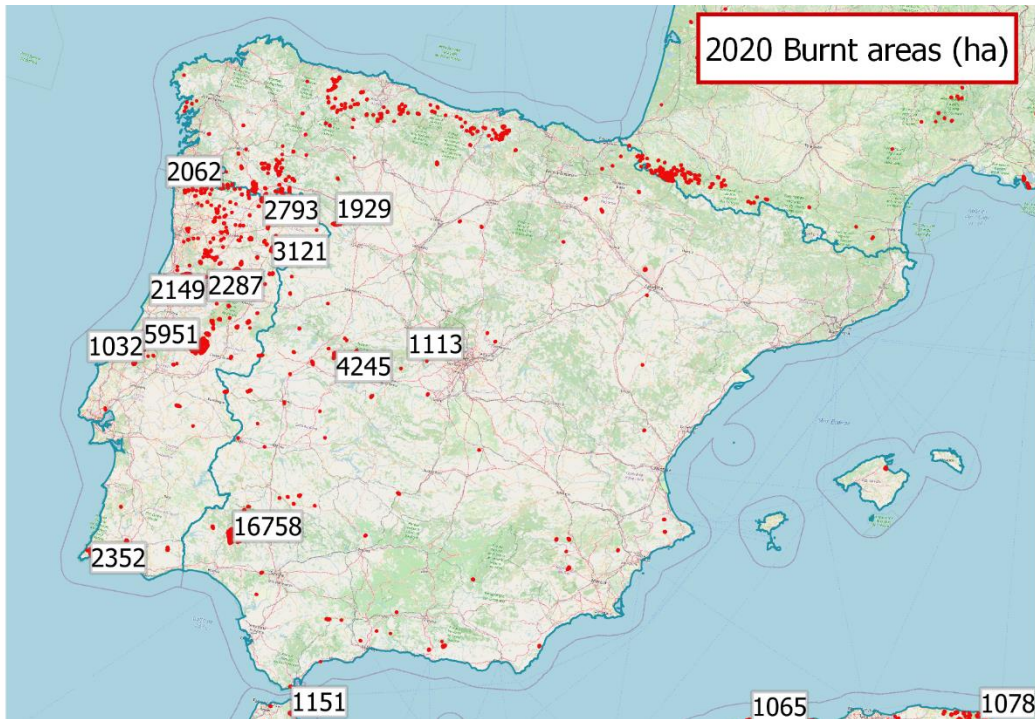


Figure 17. Fire scars in Spain in 2020. Largest fires are indicated in ha.

### 1.2.27 Sweden

The 2020 fire season in Sweden was similar to that of 2019, with 6 fires over 30 ha burning a total of 769 ha in March, June and August. Two-thirds of the burnt area occurred in Forest and Other Wooded Land (Table 26). There were two fires on Natura2000 sites which burned a total of 499 ha, amounting to 65% of the total and 0.009% of the Natura2000 area of the country.

Table 26. Distribution of burnt area (ha) in Sweden by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	486.53	63.27
Other Natural Land	266.39	34.64
Other Land Cover	16.08	2.09
<b>TOTAL</b>	<b>769</b>	<b>100</b>

### 1.2.28 Turkey

The fire season in Turkey was another bad one, and it was the fourth most affected country mapped by EFFIS in the 2020 fire season. The total burnt area was 99 857 ha from 472 fires over 30 ha, the highest amount recorded since 2016. Three-quarters of the burnt area was mapped between July and September, but at least one large fire occurred in every month of the year. The most affected land type was evenly divided between Forest and Other Wooded Land and Other Natural Land. Table 27 presents the distribution of the mapped burned area by land cover type. The visible scars from forest fires in the south-east of the country are shown in Figure 18.

Table 27. Distribution of burnt area (ha) in Turkey by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	41440.41	41.5
Other Natural Land	42829.11	42.89
Agriculture	15402.66	15.42
Artificial Surfaces	32.97	0.03
Other Land Cover	151.86	0.15
<b>TOTAL</b>	<b>99857</b>	<b>100</b>

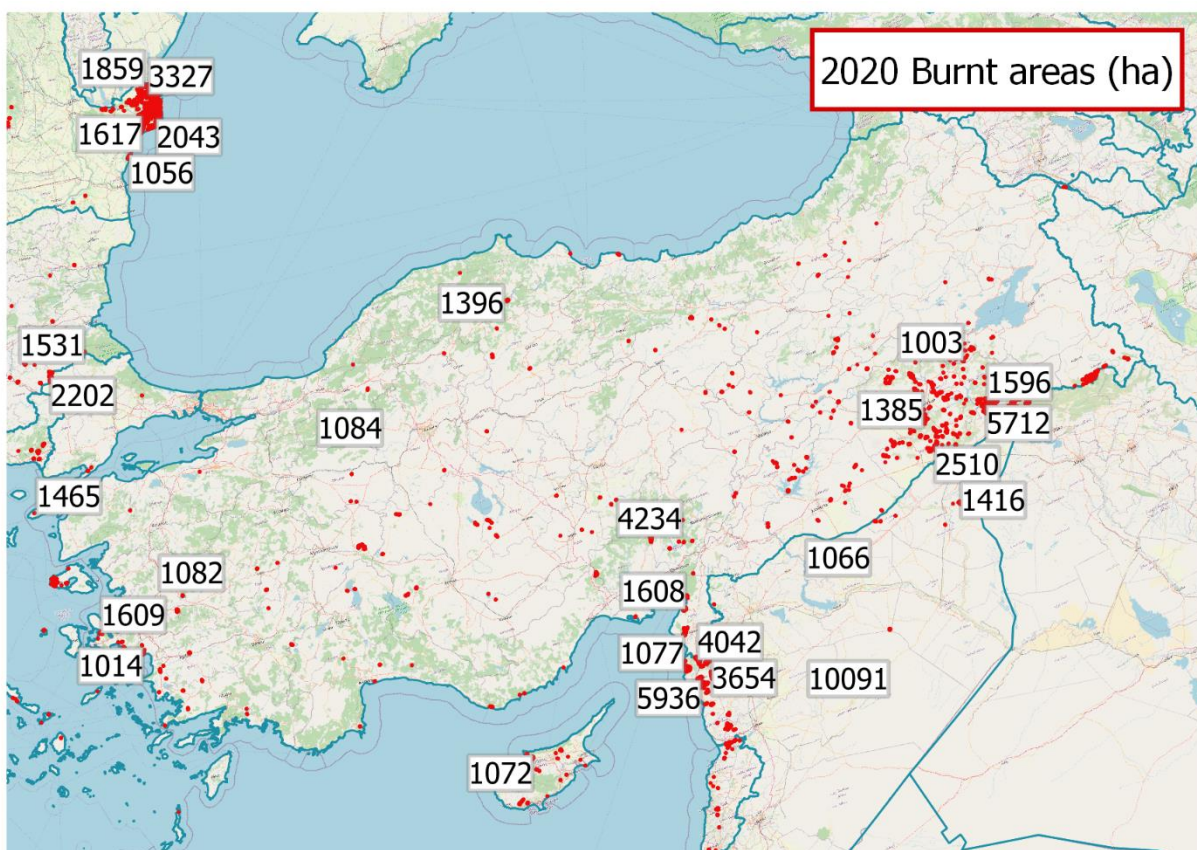


Figure 18. Fire scars in Turkey in 2020. Largest fires are indicated in ha.

Land cover	Area burned	% of total
Forest/Other Wooded Land	168761.91	66.08
Other Natural Land	17747.15	6.95
Agriculture	67582.15	26.46
Artificial Surfaces	519.92	0.2
Other Land Cover	796.87	0.31
<b>TOTAL</b>	<b>255408</b>	<b>100</b>

### 1.2.29 Ukraine

Fires were mapped in Ukraine for the first time in 2020. A total of 209 fires over 30 were mapped, resulting in a burnt area of 255 408 ha, making it the most affected country across the whole area covered by EFFIS. Fires were mapped from March to October, but over two-thirds of the total mapped burnt area occurred early in the year in April, including the largest fires mapped anywhere in 2020.

10 of the 15 largest fires of the year were mapped in Ukraine, the largest of which covered over 45 000 ha, and there were three other fires over 10 000 ha.

66% of the burnt area was classified as Forest and Other Wooded Land, and a further 27% was agricultural land (Table 28, Figure 19).

Table 28. Distribution of burnt area (ha) in Ukraine by land cover types in 2020.

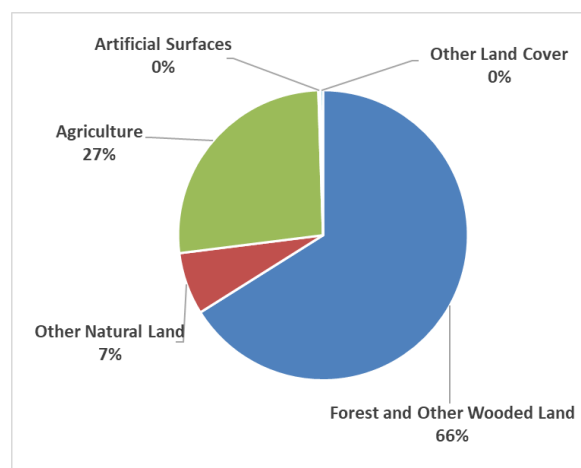


Figure 19. Burnt area according to land cover type in Ukraine in 2020.

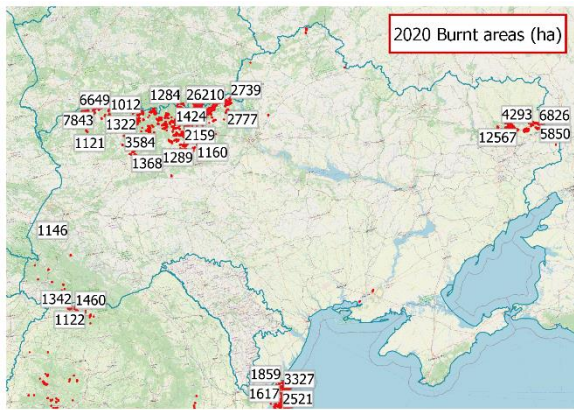


Figure 20. Burnt area scars in Ukraine in 2020. Largest fires are indicated in ha.

### 1.2.30 United Kingdom

The 2020 fire season in the UK was somewhat better than the past two years, with less than half the burnt area that was recorded in 2019. As usual in the UK, most of the damage occurred early in the season, with 80% of the total burnt area mapped in March and April. In 2020 the worst affected region was Wales, and 5 of the 7 fires which were over 500 ha were mapped in South West Wales, with one in the Central Valleys. However, the largest fire in the UK in 2020 was in Scotland, in Dumfries and Galloway region, with over 1 500 ha burnt. Of the total, 2 891 ha occurred on Natura2000 land, amounting to 21% of the total burnt area and 0.164% of the Natura2000 land in the UK. As is usual for the UK, Other Natural Land was by far the most affected land type (Table 29).

Table 29. Distribution of burnt area (ha) in the UK by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	1109.04	8.04
Other Natural Land	12536.09	90.89
Agriculture	69.94	0.51
Artificial Surfaces	36.97	0.27
Other Land Cover	40.96	0.3
<b>TOTAL</b>	<b>13793</b>	<b>100</b>

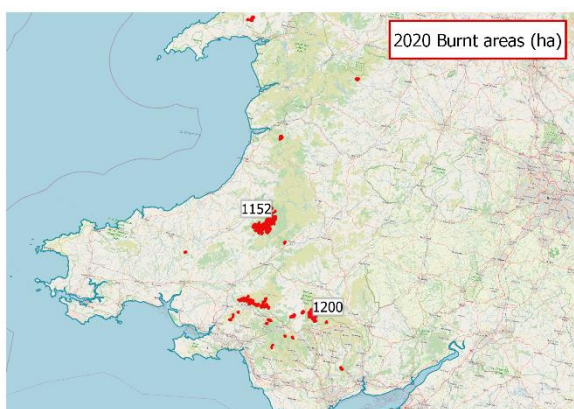


Figure 21. Detail of burnt area scars in Wales in 2020. Largest fires are indicated in ha.

### 1.3 Middle East and North Africa

The burnt area mapped in North Africa and the Middle East was lower than 2019, mainly because the total for Syria was much lower than the extreme mapped last year. Otherwise, conditions were worse than average, with the second highest burnt area since 2012. In 2020, Algeria was the most affected of the MENA countries.

#### 1.3.1 Algeria

The total mapped burnt area in Algeria was the highest since 2012. There were 534 fires over 30 ha mapped, leading to a total burnt area of 114 704 ha, half of which was on agricultural land. Fires were mapped between June and November, but almost 90% of the damage occurred in July and August. The largest fire of the year in Algeria covered 5 482 ha, and there were 48 others over 500 ha.

1 856 ha of protected areas were burnt, amounting to 1.115% of the protected land of Algeria. The Globcover land cover map from ESA was used to split the burnt area into different land type categories, harmonised with CLC terminology, and the distribution of burnt area by these land cover types is given in Table 30.

The burnt scars left by these fires can be seen in Figure 23 below.

Table 30. Distribution of burnt area (ha) in Algeria by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	47508.56	41.42
Other Natural Land	10459.62	9.12
Agriculture	55078.67	48.02
Artificial Surfaces	187.90	0.16
Other Land Cover	1469.24	1.28
<b>TOTAL</b>	<b>114704</b>	<b>100</b>

#### 1.3.2 Israel

Thirteen fires were mapped in Israel, burning a total of 2 824 ha between May and October, around 50% more than in 2019. Three of the fires exceeded 500 ha in size, and almost two thirds of the land type affected was agricultural areas.

Table 31. Distribution of burnt area (ha) in Israel by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	862.56	30.54
Other Natural Land	255.28	9.04
Agriculture	1706.17	60.42
<b>TOTAL</b>	<b>2824</b>	<b>100</b>

#### 1.3.3 Jordan

In October, a fire of 163 ha was mapped in Jordan, affecting mostly Agricultural Land.

Table 32. Distribution of burnt area (ha) in Jordan by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Other Natural Land	15.90	9.76
Agriculture	147.10	90.24
<b>TOTAL</b>	<b>163</b>	<b>100</b>

#### 1.3.4 Lebanon

The fire season in Lebanon was worse than that of 2019, partly as a result of a fire of 750 ha that affected Noura El-Faouka et Tahta province in October. Other fires of over 30 ha were mapped from May, but 80% of the damage was at the end of the season in October. Half of the mapped burnt area was in Agricultural Land. One fire of 53 ha was mapped on protected land, which equates to 0.256% of the protected land cover in Lebanon. Table 33 presents the distribution of the mapped burnt area by land cover type using the Globcover land cover map, harmonised with CLC.

Table 33. Distribution of burnt area (ha) in Lebanon by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	785.34	26.79
Other Natural Land	602.03	20.54
Agriculture	1543.63	52.67
<b>TOTAL</b>	<b>2931</b>	<b>100</b>

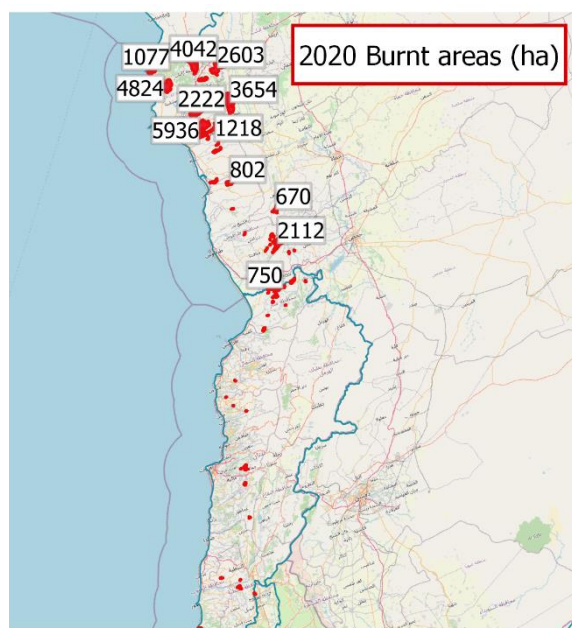


Figure 22, Burnt area scars in Syria and Lebanon in 2020. Largest fires are indicated in ha.

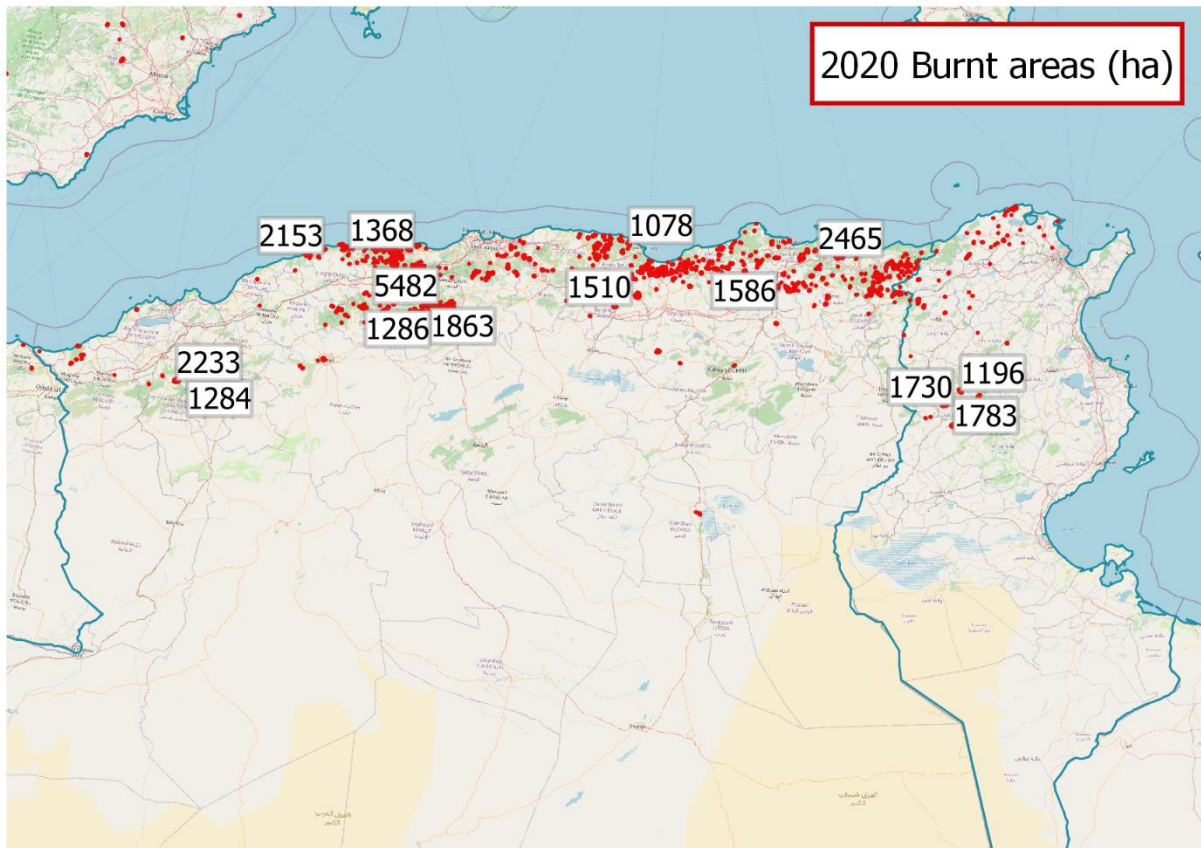


Figure 23. Mapped burnt area scars in northern Algeria and Tunisia in 2020. Largest fires are indicated in ha.

### 1.3.5 Libya

It was the most extreme fire season in Libya since 2013. Over 90% of the total burnt area was mapped in May and June, including three fires over 500 ha. In total, there were 8 fires over 30 ha, burning 2615 ha. Table 34 presents the distribution of the mapped burnt area by land cover type using the Globcover land cover map, harmonised with CLC.

Table 34. Distribution of burnt area (ha) in Libya by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	1415.38	54.13
Other Natural Land	623.28	23.83
Agriculture	576.34	22.04
<b>TOTAL</b>	<b>2615</b>	<b>100</b>

### 1.3.6 Morocco

In Morocco, the total mapped burnt area was the highest since 2012, and around 50% higher than was recorded in 2019. 26 fires over 30 ha burned a total of 7 382 ha between March and October, although over 90% of the damage occurred in August and September. The largest fire of the year was in Larached province at the end of August and covered over 2 000 ha, and there were four other fires of over 500 ha.

Of the annual total, only 36 ha occurred in Protected Areas, a big drop from the previous year (1 244 ha). This amounts to 0.5% of the total burnt in the year and 0.005% of the total protected areas of the country. The distribution of burnt area by land cover types, using Morocco's own land cover map but with terminology harmonised with CLC, is given in Table 35.

Table 35. Distribution of burnt area (ha) in Morocco by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	5555.51	75.26
Other Natural Land	96.03	1.3
Agriculture	1730.47	23.44
<b>TOTAL</b>	<b>7382</b>	<b>100</b>

### 1.3.7 Palestinian Territory

There were two fires over 30 ha mapped in the Palestinian Territory, one in May and the second in June, burning a total of 106 ha.

Table 36. Distribution of burnt area (ha) in Palestinian Territory by land cover types in 2020,

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Other Natural Land	92.13	86.92
Agriculture	13.87	13.08
<b>TOTAL</b>	<b>106</b>	<b>100</b>

### 1.3.8 Syria

After a severe season last year, 2020 was much quieter in Syria. The season started in May, when Syria's largest fire of the year burned over 10 000 ha. However, most of the damage occurred in October, when two-thirds of the year's total was mapped. There were 11 other fires over 1 000 ha, and a further 4 that exceeded 500 ha.

The Globcover land cover map, harmonised with CLC, was used to split the burnt area into different land type categories (Table 37).

Table 37. Distribution of burnt area (ha) in Syria by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	14472.43	31.24
Other Natural Land	13834.06	29.86
Agriculture	18019.50	38.89
Other Land Cover	4.00	0.01
<b>TOTAL</b>	<b>46330</b>	<b>100</b>

### 1.3.9 Tunisia

Tunisia had a worse than average fire season, with more than three times the burnt area that was mapped in 2019, although the total fell short of the extreme year of 2017. There were 53 fires over 30 ha mapped between May and September, with over 80% occurring in July and August. Three fires were over 1 000 ha in size. Of the total 11106 ha mapped, the majority occurred in Forest and Other Wooded Land.

Figure 23 on page 28 shows the burnt scars left by these fires. The distribution of burnt area by land cover types using Tunisia's own land cover map but with terminology harmonised with CLC, is given in Table 38.

Table 38. Distribution of burnt area (ha) in Tunisia by land cover types in 2020.

<i>Land cover</i>	<i>Area burned</i>	<i>% of total</i>
Forest/Other Wooded Land	9956.17	89.65
Other Natural Land	219.73	1.98
Agriculture	886.95	7.99
Artificial Surfaces	4.01	0.04
Other Land Cover	39.13	0.35
<b>TOTAL</b>	<b>11106</b>	<b>100</b>

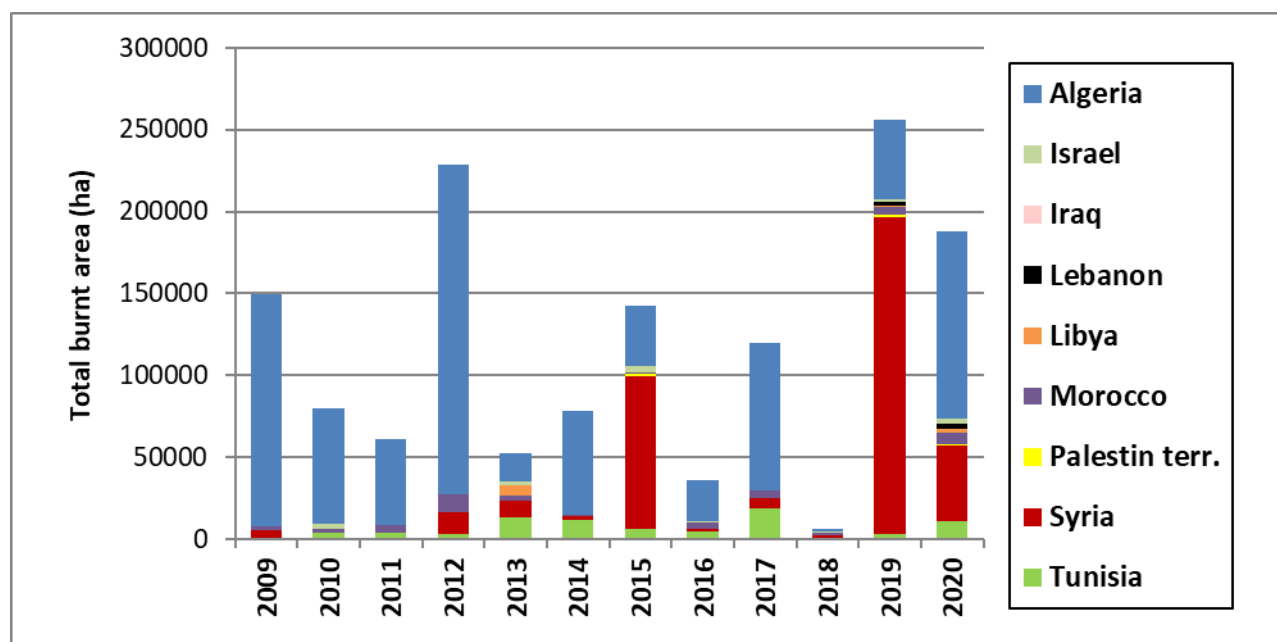


Table 39. Overview of fires in the MENA region in the last 12 years.

## 1.4 Conclusions

The forest fire season in 2020 was characterized by a large number of wildfires during the first half of the year, in Winter over the Danube delta and in the Pyrenees, and in Spring mainly over the Balkan region. During Summer and Autumn, the most affected areas were the Mediterranean countries, which recorded the largest fire events of 2020 in the EU, specifically in Spain and Portugal. The largest fire events of the year occurred in Ukraine. These events were of particular interest and concern, as they took place near the Chernobyl nuclear reactor.

Although fire danger conditions during the peak of the fire season, i.e. summer months, were not favourable, the EU Mediterranean countries were able to contain the wildfires that occurred, although the total burnt area in 2020 in the EU was above the average for the period 2008-2019. Given the high number of fires in winter and spring, the cumulative area of fires at the end of the year was above the average for the period 2008-2019.



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