

Contents

Authors – European report.....	1
Authors – Country reports.....	2
Preface “Forest Fires in Europe, Middle East and North Africa 2021”	4
Executive summary.....	6
1 Forest Fires in 2021: Country reports from National Fire Services.....	7
1.1 Introduction to the 2021 fire season.....	7
1.2 European countries.....	8
1.2.1 Austria.....	8
1.2.2 Bulgaria.....	11
1.2.3 Croatia.....	12
1.2.4 Cyprus.....	14
1.2.5 Czech Republic	17
1.2.6 Estonia	19
1.2.7 Finland.....	20
1.2.8 France.....	22
1.2.9 Germany	29
1.2.10 Greece	32
1.2.11 Hungary.....	35
1.2.12 Ireland.....	38
1.2.13 Italy.....	40
1.2.14 Latvia.....	50
1.2.15 Lithuania.....	52
1.2.16 The Netherlands.....	54
1.2.17 Norway.....	58
1.2.18 Poland.....	62
1.2.19 Portugal.....	67
1.2.20 Republic of North Macedonia	73
1.2.21 Romania.....	77
1.2.22 Serbia.....	80
1.2.23 Slovakia.....	83
1.2.24 Slovenia.....	86
1.2.25 Spain	87
1.2.26 Sweden	94
1.2.27 Switzerland.....	100
1.2.28 Turkey.....	101
1.2.29 Ukraine.....	107
1.2.30 United Kingdom.....	111
1.3 Comparison of Southern EU countries with longer time series (1980-2021).....	115
1.4 Middle East and North Africa Countries	118
1.4.1 Algeria.....	118
1.4.2 Israel.....	121
1.4.3 Lebanon.....	123
1.4.4 Morocco.....	126
2 Wildfires in 2021: Country reports from EFFIS.....	132
2.1 EFFIS Rapid Damage Assessment: 2021 results.....	139
2.1.1 Damage to Natura2000 and other protected sites.....	141
2.1.2 Affected land cover types.....	142
2.1.3 European countries (EU27)	143
2.2 Mapped burnt area by country.....	144
2.2.1 Albania	144
2.2.2 Austria.....	145
2.2.3 Belgium.....	145

2.2.4	Bosnia and Herzegovina	145
2.2.5	Bulgaria	145
2.2.6	Croatia	145
2.2.7	Cyprus	146
2.2.8	Denmark	146
2.2.9	Finland	146
2.2.10	France	147
2.2.11	Germany	148
2.2.12	Greece	148
2.2.13	Hungary	149
2.2.14	Ireland	149
2.2.15	Italy	149
2.2.16	Kosovo under UNSCR 1244	150
2.2.17	Latvia	150
2.2.18	Lithuania	150
2.2.19	Montenegro	150
2.2.20	North Macedonia	150
2.2.21	Norway	151
2.2.22	Poland	151
2.2.23	Portugal	151
2.2.24	Romania	152
2.2.25	Serbia	152
2.2.26	Slovakia	152
2.2.27	Slovenia	153
2.2.28	Spain	153
2.2.29	Sweden	154
2.2.30	Switzerland	154
2.2.31	Turkey	154
2.2.32	Ukraine	155
2.2.33	United Kingdom	155
2.3	Middle East and North Africa	156
2.3.1	Algeria	156
2.3.2	Iraq	156
2.3.3	Israel	156
2.3.4	Lebanon	157
2.3.5	Libya	157
2.3.6	Morocco	157
2.3.7	Palestinian Territory	157
2.3.8	Syria	158
2.3.9	Tunisia	158
2.4	Conclusions	159
2.5	List of acronyms	159
3	EFFIS Applications	160
3.1.1	The Current Situation Application	160
3.1.2	The Fire News Application	161
3.1.3	The EFFIS Statistics Portal	162
3.1.4	The EFFIS Fire Database	164
4	References and background documentation	166
	Annex – Summary Tables of Fire Statistics	169

Authors – European report

JOINT RESEARCH CENTRE

Directorate E: Space, Security & Migration

Disaster Risk Management

EFFIS TEAM

Jesús San-Miguel-Ayanz¹

Tracy Durrant²

Roberto Boca³

Giorgio Libertà¹

Alfredo Branco³

Daniele de Rigo³

Davide Ferrari²

Pieralberto Maianti³

Tomàs Artés Vivancos¹

Duarte Oom¹

Hans Pfeiffer²

Rosanna Grecchi³

DIRECTORATE-GENERAL ENVIRONMENT

Directorate D1: Natural Capital

Land Use & Management

Marco Onida⁴

DIRECTORATE-GENERAL FOR CLIMATE ACTION

Directorate A: International, Mainstreaming and Policy Coordination

Peter Löffler⁵

1 European Commission, Joint Research Centre (JRC), Directorate for Space, Security and Migration, Disaster Risk Management Unit, Ispra (VA), Italy

2 External consultant for the European Commission (Engineering Ingegneria Informatica S.p.A.) Piazzale dell'Agricoltura (RM), Italy

3 External consultant for the European Commission (ARCADIA SIT s.r.l.) Vigevano (PV), Italy

4 European Commission, Directorate General Environment, Directorate D: Natural Capital, Land-Use and Management Brussels, Belgium

5 European Commission, Directorate General for Climate Action, Directorate A: International, Mainstreaming and Policy Coordination Adaptation Brussels, Belgium

Authors – Country reports

Algeria	Abdelhafid BENCHIKHA Mohamed ABBAS	Direction Générale de la Protection Civile Direction Générale des Forêts
Austria	Raphael KOLLER Harald VACIK Mortimer MÜLLER Kilian HEIL	The Austrian Fire Brigade Association University of Natural Resources and Life Sciences, Vienna Austrian Federal Ministry of Agriculture, Forestry, Regions and Water Management Executive Forest Agency
Bulgaria	Vladimir KONSTANTINOV	
Croatia	Miljenko DESKIVIC Ante KALIGER Siniša PETKOVIČEK	Directorate for Forestry, Hunting & Wood Industry, Ministry of Agriculture National Protection and Rescue Directorate
Cyprus	Kostas PAPAGEORGIOU Petros PETROU Ioannis TOUMASIS	Ministry of Agriculture, Rural Development and Environment Department of Forests
Czech Rep.	Jan PECL	Fire and Rescue Service of the Czech Republic General Directorate
Estonia	Mati VALGEPEA	Estonian Environment Agency
Finland	Rami RUUSKA	Ministry of Interior, Department for Rescue Services
France	Lionel RICHAILLEY Fabrice CHASSAGNE Remí SAVAZZI	Ministère de L'Agriculture et de la Souveraineté Alimentaire Ministère de l'Intérieur et des Outre Mer/ Direction Générale de la Sécurité civile et de la gestion des crises Office National des Forêts
Germany	Astrid GONSCHOREK	Federal Agency for Agriculture and Food
Greece	Maria PANTELI	Ministry of Environment and Energy; Directorate General for the Forests
Hungary	Peter DEBRECENI Dániel NAGY	National Food Chain Safety Office, System Management and Supervision Directorate
Ireland	Ciaran NUGENT	Forest service, Department of Agriculture, Food and the Marine (DAFM)
Israel	Avraham Ben ZAQUEN	Fire and Rescue Commission, Ministry of Public Security
Italy	Marco di FONZO, Renato SCIUNNACH Gianfilippo MICILLO Giovanni FRESU Marcello MARZOLI Enrico POMPEI Silvia FERLAZZO Davide ASCOLI Raoul ROMANO	CUFAA – Comando Carabinieri per la Tutela Forestale – Nucleo Informativo Antincendio Boschivo National Fire Corps – Forest Fire Fighting Service Mipaaf – Ministry of agricultural food and forestry policies - General Directorate of Mountain Economy and Forestry
Latvia	Andis PURS Zigmunds JAUNĶĪS	State Forest Service; Environmental and Forest Protection Department
Lebanon	George MITRI	University of Balamand
Lithuania	Svetlana REPŠIENĖ Zbigneŭ GLAZKO	Ministry of Environment, State Forest Enterprise

Morocco	Fouad ASSALI Hajar BENAÏSSA Hicham MHARZI ALAOUI	National Centre for Forest Climate Risk Management National Water and Forest Agency - Rabat
Netherlands	Edwin KOK Cathelijne STOOF	Netherlands Institute for Public Safety, Netherlands Fire Service Department of Environmental Sciences, Wageningen University
North Macedonia	Maja TIMOVSKA	Protection and rescue Directorate Planning, prevention and development sector
Norway	Dag BOTNEN	The Norwegian Directorate for Civil Protection (DSB)
Poland	Józef PIWNICKI Ryszard SZCZYGIEL	Forest Research Institute Forest Fire Protection Department
Portugal	João MOREIRA Miguel CRUZ	Institute for Nature Conservation and Forests National Authority for Emergency and Civil Protection
Romania	Călin POPA	Ministry of Environment, Waters and Forests
Serbia	Slobodan MILANOVIĆ	Centre for Forest Fire Research - University of Belgrade Faculty of Forestry Forest Directorate - Ministry of Agriculture, Forestry and Water Management
Slovakia	Valéria LONGAUEROVÁ	National Forest Centre; Forest Research Institute
Slovenia	Jošt JAKŠA	Ministry of Agriculture, Forestry and Food
Spain	Celia GARCÍA FECED	Ministry for the Ecological Transition and the Demographic Challenge Wildland Fire Management Service
Sweden	Leif SANDAHL Stefan ANDERSSON	Swedish Civil Contingencies Agency (MSB) Civil Protection Department, Natural Hazards and Decision Systems Section
Switzerland	Stefan BEYELER Michael SAUTTER Marco CONEDERA Boris PEZZATTI	Federal Office for the Environment Swiss Federal Research Institute WSL
Turkey	Hasan Murat ERSOZ Mustafa SONGÜR Alper YILMAZ	General Directorate of Forestry In TURKEY
UK	Rob GAZZARD	Forestry Commission Forest Research UK
Ukraine	Serhii SYDORENKO Mykola GONTARUK Olena PAVLENKO	Ukrainian Research Institute of Forestry and Forest Melioration named after G. M. Vysotsky The State Forest Resources Agency of Ukraine State Enterprise Forestry Innovation and Analytical Centre

Preface “Forest Fires in Europe, Middle East and North Africa 2021”

2021 was again a drastic year that raised our concern about wildfires and their impacts in the European Union and its neighbour countries. Over 5 500 km² of land were burned in 2021 – more than twice the size of Luxembourg – with over 1 000 km² within protected areas of Europe’s Natura 2000 network., the EU’s reservoirs of biodiversity. The damage caused in many of these invaluable ecosystems will take many years to restore. The Union Civil Protection Mechanism (UCPM) was triggered nine times in 2021 to support affected countries in extinguishing fires and complement national capacities. Wildfires not only affected EU countries but impacted hard on some of our neighbouring countries in the Mediterranean region, causing large numbers of human casualties and damage.

However, in this report we are not only taking stock on the damage caused by wildfires in 2021, but we also look at the impact of wildfires in 2022. Currently, 2022 is the year with the highest number of fires since 2006. This is in addition to what is expected to be recorded as the most severe drought in Europe in 500 years. The area burnt expands to over 8 600 km² in the EU – the largest area burnt by wildfires since 2006. The UCPM was triggered 11 times in the same period to support with aerial and ground firefighting forces to bring the wildfires under control. Although the area burnt by wildfires was remarkably extensive this year, the number of victims caused by these fires has been contained, thanks to the prevention measures implemented by the EU and its Member States and the enhanced preparedness and firefighting operations of the fire management services.

The EU continues to work on mitigating the impact of wildfires: the new EU Strategy on Adaption to Climate Change, published in March 2021, sets out the framework for preparing for the unavoidable impact of climate change. The 2021 new EU Forest Strategy¹ provides the basis for enhanced fire prevention and climate resilience of our forests, building on the guidelines for prevention of wildfires². These guidelines include managing vegetation to avoid the accumulation of fuels on the ground.

Furthermore, in 2021 the EU reinforced the UCPM capacity to increase the aerial firefighting means at its disposal and to assist countries during this fire season. This reinforced capacity is coordinated by the Emergency Response Coordination Centre (ERCC) of the European Civil Protection and Humanitarian Aid Operations (ECHO). The support of the Joint Research Centre, through the provision of timely information on ongoing forest fires, aids informed decision- making on dispatching the aerial means funded by the EU.

The drastic effect of wildfires in Europe, presented in this report for 2021, reflects many of the impacts presented in the 2020 report. It is expected that these will be again included in the 2022 report – when the impact of this season’s wildfires will be fully evaluated. Wildfires raging from west to east and across northern, central and southern European countries offer clear evidence of the effects of climate change. The result is not only the expansion of the affected areas, but the longer duration of the fire season. The latter now extends beyond the traditional summer months. Furthermore, the high frequency and intensity of wildfires in the summer puts our fire-fighting services under unprecedented conditions of fire danger, with aerial firefighting often losing its effectiveness, and ground firefighting difficult or impossible. The trend of these unprecedented fires occurs not only in Europe, Middle East and North Africa, but across the globe, as in California, Australia, South America, etc. It is thus essential, along with enhancing preparedness and response capacities, to prepare our population through education and awareness-raising campaigns to live with wildfires, as they become more frequent and intense because of climate change.

The trend of wildfires in Europe, possibly aggravated by increased fire danger conditions under existing climate change scenarios, calls for a comprehensive and coordinated approach to prevent and mitigate wildfires. As mentioned in previous reports in this series, it is necessary to reiterate that around 96% of wildfires in the EU are caused by human actions. This means that prevention measures must be stepped up and include a strong focus on raising the awareness of key stakeholders – including rural actors in direct contact with natural areas, as well as the enlarged population segment living in the so-called wildland urban interface. Enhanced information on wildfire risk areas in Europe³ and new risk management practices, such as those recommended under the new EU Forest Strategy, can result in measures leading to a reduction in the number of fire outbreaks and the mitigation of their impact when they occur. Moreover, the development of early warning and information systems for wildfires can pave the way to evidence-based policy- making

¹ https://ec.europa.eu/environment/strategy/forest-strategy_en

² <https://op.europa.eu/en/publication-detail/-/publication/4e6cc1f1-8b8a-11eb-b85c-01aa75ed71a1>

³ <https://publications.jrc.ec.europa.eu/repository/handle/JRC130136>

to protect our forests, restore those already damaged by wildfires and minimize the number of human casualties, especially every summer.

Increasing fire-suppression capacities is necessary. However, it will not be sufficient without, at the same time, increasing efforts to prevent fire from igniting in the first place. There is a need for an integrated wildfire risk management approach and a close collaboration between EU institutions and wildfire management services and civil protection authorities. Exchange of good practices and experiences, and information-sharing on wildfires is essential for a coordinated approach to wildfire risk management. These exchanges are facilitated by mechanisms such as the Expert Group on Forest Fires, the Expert Groups under the UCPM, and the European Forest Fire Information System. These mechanisms, coordinated by the Directorate General for Environment, the Directorate General for Civil Protection and Humanitarian Aid Operations, and the Joint Research Centre respectively, could be put to further use: Only through better information and stronger cooperation across the EU will it be possible to tackle the growing threat of wildfires and their potentially devastating effects because of climate change.

This new report of the “Forest Fires in Europe, Middle East and North Africa” series provides, once again, valuable insights, presenting national fire management activities and the actions taken at both national and European levels during the fire campaigns in 2021. Thus, it is an important source of information supporting evidence-based policymaking and the design of current and future initiatives for mitigating the effects of wildfires at the European Union and international level.



Mariya Gabriel

*European Commissioner
for Innovation, Research,
Culture, Education and
Youth*



Virginijus Sinkevičius

*European Commissioner for
Environment, Oceans and
Fisheries*



Janez Lenarčič

*European Commissioner for
Crisis Management*

Executive summary

This issue of the EFFIS annual report on forest fires for the year 2021 is the 22nd in the series. This report is consolidated as highly appreciated documentation of the previous year's forest fires in Europe, Middle East and North Africa. The section on national reporting gives an overview of the efforts undertaken at national and regional levels in the majority of countries in the EFFIS network. This is followed by information from EFFIS on the evolution of fire danger in the European and Mediterranean regions and the damage caused by fires in the 43 countries on the network.

The preparation and publication of the report aims at improving cooperation with the members of the Expert Group on Forest Fires (EGFF) especially with regard to fire prevention and climate change adaptation measures in relation of fires. Our common aim is to maintain and protect our landscapes and natural heritage, to avoid loss of human lives and to minimise the damage caused to property by uncontrolled forest fires.

The aim of the European Forest Fire Information System (EFFIS) is to provide harmonised information on forest fires and assessment of their effects in the pan-European region. For this purpose, collaboration with EU Member States and neighbouring countries has been on-going since 1998. EFFIS started as a pilot project of collaboration between the European Countries and the European Commission in the area of fire information and fire prevention.

On the Commission side, EFFIS was initiated by the Joint Research Centre in collaboration with the DG Environment. Due to the high support from the Expert Group on Forest Fires, which constitutes the network of experts from the countries contributing to EFFIS, the system was developed to an operational level supporting national and European policies and providing the information basis for the discussion of issues related to forest fires in the European Parliament⁴. Currently, EFFIS provides operational support to DG ECHO in the area of civil protection, DG DEFIS in the implementation of the Copernicus Regulation [3] as well as to DG REGIO regarding the implementation of the EU Solidarity Fund Regulation [4] for critical fires. In 2015, EFFIS was included as a component of the EU Copernicus Program Emergency Management Services, which provides a legal and financial basis for its operation under this framework since then.

EFFIS provides an ideal platform for countries to exchange good practices on fire prevention, firefighting, restoration practices and other activities related to fire management, and for the European Commission to update the forest fire services in the countries on relevant initiatives at the European level.

Since its first operation in the year 2000, the number of countries contributing to the information on forest fires in EFFIS and receiving data from it has increased steadily. The EFFIS system was used by government organizations and citizens, with over 414 000 users from 197 countries in 2021.

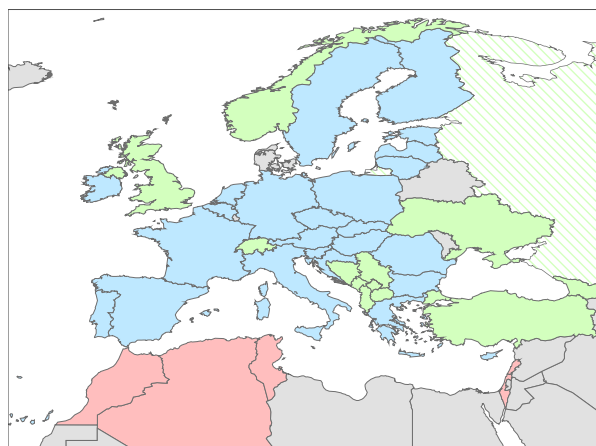


Figure 1. EFFIS network (blue: EU; green: non-EU; pink: MENA).

Currently, the EFFIS network constitutes 43 countries, including 25 EU Member States (Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, and the Netherlands), 13 European non-EU countries (Albania, Bosnia & Herzegovina, Republic of North Macedonia, Georgia, Kosovo, Montenegro, Norway, Serbia, Switzerland, Turkey, Ukraine and the United Kingdom), and 5 MENA countries (Algeria, Israel, Lebanon, Morocco and Tunisia). (Russia is temporarily excluded from the network).

⁴<http://www.europarl.europa.eu/plenary/en/parliamentary-questions.htm>

1 Forest Fires in 2021: Country reports from National Fire Services

1.1 Introduction to the 2021 fire season

Table 1. Overview of the number of fires and burnt areas as reported by the contributing countries in 2021⁵.

Country	Number of fires			Burnt area (ha)			Notes
	2021	2011-20 average	2021 as % of average	2021	2011-20 average	2021 as % of average	
Algeria	1631	2976	55	100101	38355	261	
Austria	164	222	74	117	57	205	
Bulgaria	349	499	70	3143	5140	61	
Croatia	116	201	58	6660	13529	49	
Cyprus	111	100	111	6612	1509	438	
Czech Rep.	1517	1410	108	411	375	110	
Estonia	32	74	43	33	111	30	
Finland	1231	1245	99	785	543	144	
France	4739	4323	110	15114	13373	113	
Germany	548	923	59	148	743	20	
Greece	1250	947	132	108418	24253	447	
Hungary	1154	1331	87	2413	4956	49	
Italy	5989	5418	111	151964	64819	234	
Latvia	448	607	74	504	634	80	
Lebanon	131	154	85	1508	1435	105	Average 2015-2020
Lithuania	46	157	29	11	102	11	
Morocco	435	463	94	3064	2954	104	
Netherlands	212	636	33	18	442	4	Average 2017-2020
North Macedonia	113	204	55	6796	4407	154	
Norway	653	264	247	653	1027	64	
Poland	3295	7383	45	894	3656	24	
Portugal	8186	17713	46	28360	130706	22	
Romania	278	353	79	2101	2325	90	
Serbia	75	127	59	1630	3983	41	
Slovakia	101	244	41	159	456	35	
Slovenia	73	92	79	124	270	46	
Spain	8780	11341	77	87880	96593	91	
Sweden	4087	4740	86	861	4728	18	
Switzerland	85	98	87	35	108	33	
Turkey	2793	2631	106	139503	9095	1534	
Ukraine ⁶	659	1649	40	289	10708	3	

⁵ Some countries do not report precise figures for fire numbers/burnt area and are not included in this table.

⁶ Data on forest fires reflect statistics obtained from forest users and owners, which are coordinated by the State Forest Resources Agency of Ukraine (73% of all forests in Ukraine).