

**Wildland-Urban Interface Fire Touristic  
Infrastructure Protection Solutions**

**WUITIPS**

GA number 101101169



Co-funded by  
the European Union

## Deliverable D7.2

### Proceedings and conclusions of Workshop I

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<b>Abstract</b>	<p>This deliverable serves as the Proceedings of the First International Workshop of the WUITIPS Project, titled "Towards a harmonized framework for cross-border fire management in touristic infrastructures." The content is structured as follows: the introduction section provides an overview of the workshop's objectives, formal agenda, and organization. It sets the context for the subsequent sections. Next, you will find a section dedicated to short CVs of all the speakers who presented during the workshop. This allows readers to gain insights into the expertise and backgrounds of the contributors. Following the speaker profiles, the document includes abstracts and printouts of all the talks, arranged according to the event agenda's timeline. This allows for easy reference and access to the information shared during the workshop. As a concluding section, a wrap-up segment gathers the main reflections and highlights future work that emerged from the workshop. This section provides valuable insights and conclusions drawn from the discussions and presentations.</p>
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(1) Draft / Final

(2) Public / Restricted / Internal

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## Table of Contents

1. Introduction .....	5
2. Speakers .....	8
Elsa Pastor .....	8
Cristina Brailescu .....	8
Maria Pipió .....	9
Mohamad El Houssami.....	9
Marjorie Sampsoni .....	9
Miguel Almeida .....	10
Giacomo Sbaragli.....	10
Klaudijo Filcic.....	10
Todor Stoyanov .....	11
Miltiadis Athanasiou.....	11
Turgay Dindaroglu.....	12
3. Presentations .....	13
3.1. The WUITIPS project overview, by Elsa Pastor .....	13
3.1.1. Abstract .....	13
3.1.2. Presentation printout.....	13
3.2. The DG-ECHO Wildfire Prevention Action Plan, by Cristina Brailescu.....	16
3.2.1. Abstract .....	16
3.2.2. Presentation printout.....	16
3.3. Survey on the state-of the art of WUI fire management in Girona (Spain), by Maria Pipió	24
3.3.1. Abstract .....	24
3.3.2. Presentation printout.....	24
3.4. Survey on the state-of the art of WUI fire management in Département des Pyrénées Orientales (France), by Mohamad El Houssami and Marjorie Sampsoni .....	28
3.4.1. Abstract .....	28
3.4.2. Presentation printout.....	28
3.5. Survey on the state-of the art of WUI fire management in Portugal, by Miguel Almeida	32
3.5.1. Abstract .....	32
3.5.2. Presentation printout.....	32
3.6. Survey on the state-of the art of WUI fire management in Tuscany region, by Giacomo Sbaragli.....	38

3.6.1.	Abstract .....	38
3.6.2.	Presentation printout .....	38
3.7.	Survey on the state-of the art of WUI fire management in Croatia, by Kludijo Filcic	45
3.7.1.	Abstract .....	45
3.7.2.	Presentation printout .....	45
3.8.	Survey on the state-of the art of WUI fire management in Bulgaria, by Todor Stoyanov	49
3.8.1.	Abstract .....	49
3.8.2.	Presentation printout .....	49
3.9.	Survey on the state-of the art of WUI fire management in Greece, by Miltiadis Athanasiou .....	55
3.9.1.	Abstract .....	55
3.9.2.	Presentation printout .....	55
3.10.	Survey on the state-of the art of WUI fire management in Turkey, by Turgay Dindaroglu .....	61
3.10.1.	Abstract .....	61
3.10.2.	Presentation printout .....	61
4.	Workshop wrap-up .....	67
	ANNEX 1 - Questionnaire .....	68

## 1. Introduction

The 1<sup>st</sup> International Workshop of Project WUITIPS, entitled “Towards a harmonized framework for cross-border fire management in touristic infrastructures”, took place in Barcelona, Catalonia (Spain), on May 11<sup>th</sup> 2023. The event was organized by the UPC team in the Barcelona East School of Engineering (EEBE) at the UPC Diagonal-Besòs Campus (Figure 1).

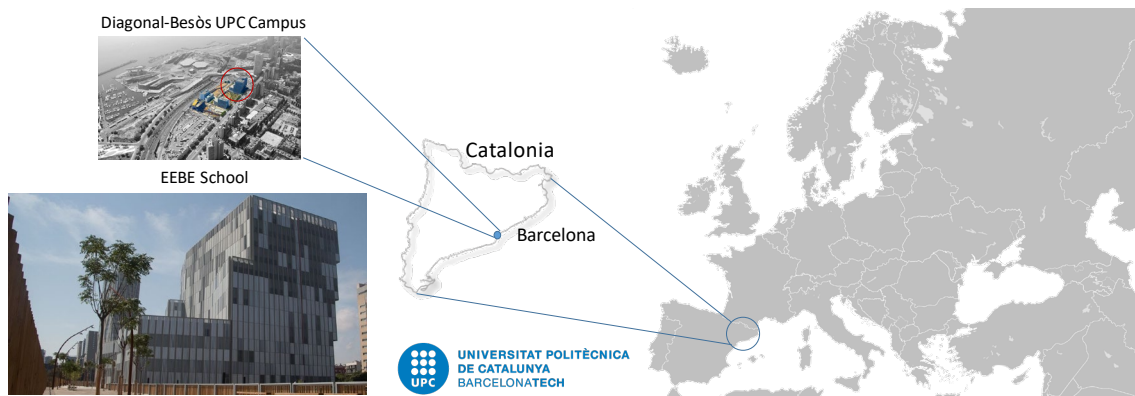


Figure 1. Venue of the 1<sup>st</sup> International WUITIPS Workshop

The main aim of the workshop was to facilitate discussions on the state of the art of protocols, methods and regulations regarding the overall cycle of wildland-urban interface (WUI) fire management, that are nowadays being used in transboundary touristic areas of the European Union. We counted on the participation of invited experts from 9 different European countries. Overall, 25 persons participated at the workshop, 21 onsite and four more online (Figure 2 and Figure 3).



Figure 2. Attendees at the WUITIPS Workshop held at the EEBE on May 11<sup>th</sup> 2023.

The Workshop was prepared by the WUITIPS consortium together with some of the members of the WUITIPS European network of experts and stakeholders, established at the project proposal stage (the WUITIPS Living Lab of Knowledge Transfer), who were asked to review the reality of their country, with particular attention to cross-border touristic areas. To this end, a 14-question survey (see Annex 1) was outlined and distributed on March 13<sup>th</sup> among representatives from Spain, France, Portugal, Italy, Croatia, Bulgaria, Turkey and Greece to gather the state of the art on governance, risk management planning, risk assessment, emergency response and risk recovery regarding wildfires/WUI fires in touristic areas. Answers were received and analysed by the WUITIPS consortium prior to the workshop, who prepared insightful cross—country discussions on the different stages of the wildfire risk management cycle.



Figure 3. Top: Round table discussion at the workshop; bottom left: presentations during the workshop; bottom right: lunch break.

The Workshop was organized as a 1-day event with presentations and round table discussions, which followed the agenda detailed in Table 1. The day started with a presentation on the WUITIPS project main aim and expected outcomes (project coordinator E. Pastor – UPC) followed by a review on the DG-ECHO Wildfire Prevention Action Plan given by WUITIPS Technical Desk Officer C. Brailescu (DG-ECHO).

After these introductory talks, a short summary of the surveys was provided by each country representative (M. Pipió – DDGI-WUITIPS, Spain; M. El Houssami – EFR-WUITIPS and M. Sampsoni - EPLFM-WUITIPS, France; M. Almeida, Portugal; G. Sbaragli, Italy; K. Filcic, Croatia; T. Stoyanov, Bulgaria; M. Athanasiou, Greece and T. Dindaroglu, Turkey). The rest of the program was divided into five round table discussions, prepared by WUITIPS moderators (E. Pastor, A. Àgueda, E. Planas and P. Vacca from UPC and M. El Housaami, from EFR) who drove discussions across countries and risk management cycle stages. The day concluded with a wrap-up by E. Pastor, who delivered acknowledgments, key take-home messages, and a review of the follow-up tasks.

Table 1. Workshop program

Time	Subject	Presentation by
9:15 – 9:30	Registration and welcome coffee	-
9:30 – 9:40	The WUITIPS project overview	E. Pastor
9:40 – 10:00	DG-ECHO Wildfire Prevention Action Plan	C. Brailescu
10:00 – 10:40	Summary of the surveys on the state-of the art of WUI fire management (1/2): <i>Short presentations (10 min each) of Spain (M. Pipió), France (M. El Houssami and M. Sampsoni), Portugal (M. Almeida) and Italy (G. Sbaragli)</i>	Invited speakers
10:40 – 10:50	<i>Wellbeing break</i>	
10:50 – 11:30	Summary of the surveys on the state-of the art of WUI fire management (2/2): <i>Short presentations (10 min each) of Croatia (K. Filcic), Bulgaria (T. Stoyanov), Greece (M. Athanasiou) and Turkey (T. Dindaroglu)</i>	Invited speakers
11.30 – 12:15	Round table discussion: Governance	Mod: E. Pastor
12:15 – 13:30	<i>Lunch*</i>	
13.30 – 14:15	Round table discussion: Risk Management Planning	Mod: A. Àgueda
14.15 – 15:00	Round table discussion: Risk Assessment	Mod: E. Planas
15:00– 15:10	<i>Wellbeing break</i>	
15.10 – 15:55	Round table discussion: Risk Prevention & Preparedness	Mod: P. Vacca
15.55 – 16:20	Round table discussion: Emergency response	Mod: M. El Houssami
16.20 – 16:30	Wrap-up	E. Pastor
16:30	<i>End of the day</i>	

## 2. Speakers

A short biographic note of each of the speakers is given here, in order of appearance.

### Elsa Pastor



**Elsa Pastor**, PhD, is Full Professor at the Chemical Engineering Department of Universitat Politècnica de Catalunya - BarcelonaTech and research scientist at the Center for Technological Risk Studies at UPC. She develops teaching and research activities in diverse fields related to wildfire management and technological risk analysis. Over the last 20 years, she has studied several aspects of fire behavior and dynamics by a multidisciplinary approach, combining both experimental and modeling techniques in a wide range of scenarios. She has profited from diverse fire environments (i.e. wildfires, wildfire research burning campaigns, outdoor large-scale industrial testing fields, compartment fires, laboratory set-ups, etc.) to observe monitor and analyze flames and their effect to different types of assets and ecosystems.

She has been the leader of the European Project (DG-ECHO co-founded) *WUIVIEW*, aimed at designing, setting-up and operating a virtual workbench service for the analysis of fire risk in the surroundings of buildings at the wildland-urban interface. She is currently leading two research projects dealing with wildland-urban interface fires: *WUICOM – BCN Fire resilient communities of Barcelona* aimed at developing and implementing a holistic approach to analyse risk at Barcelona metropolitan area due to WUI fires, accounting for infrastructural, societal and ecosystems vulnerabilities; and the European project *WUITIPS - Wildland-Urban Interface Fire Touristic Infrastructure Protection Solutions*, aimed at advancing towards a harmonised understanding of the wildfire problem in touristic areas, providing knowledge on the impact of fire on buildings, installations, cultural heritage, infrastructures and the involved population.

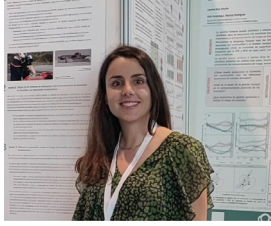
### Cristina Brailescu



**Cristina Brailescu**, team leader, Unit B.2 Prevention and Disaster Risk Management. European Commission, Directorate-General for European Civil Protection and Humanitarian Aid Operations (DG-ECHO), Brussels, Belgium. Former officer at the Unit of Land Use and Management (D1) at the Directorate-General of Environment from the European Commission.



### Maria Pipió



Maria Pipió is a forest engineer specialized in forest fire prevention in wildland urban interface (WUI). She has a Master's degree in Management of Sustainable Development and Climate Change from Toulouse Business School (France). She leads the municipal fire prevention support program at wildland urban interface in the Provincial Council of Girona (Diputació de Girona). She has previous experience in cross-border projects for increasing wildfire management capabilities among Spain and France, by leading DDGI effort in past POCTEFA project COOPEREM

### Mohamad El Houssami



Mohamad EL HOUSSAMI, project manager in the fire safety engineering department at Efectis in France. The scope of his projects are mostly related to fire safety in industrial buildings, including fire risks related to batteries and photovoltaic panels, in addition to managing the European project on fire statistics and the participation in ISO standardisation committees. Mohamad holds as PhD from the University of Edinburgh during which he covered several topics of forest fires, such as the physical modelling of fuel beds, small scale experimentation of pine needle litters, characterisation of firebrand generation mechanisms and conducted instrumented prescribed fires. He published more than dozen peer reviewed publications and is an active reviewer in Fire Technology, International Journal of Wildland Fire, Combustion and Flame, Fire and Materials and Fire Safety Journal.

### Marjorie Sampsoni



Captain Marjorie SAMPSONI is an officer employed by ENTENTE VALABRE, she has an engineering degree in civil security and risk law. Before becoming a firefighter, she worked in the field of occupational risk assessment in public and private companies. She also worked within the General Directorate of Civil Security and Risk Management of the Ministry of the Interior, in the field of international relations, in connection with the Emergency Response Coordination Center (ERCC). She participated in the organization of 2 European exercises: on CBNRe (France, Drôme, 2004) and on forest fires (France, Bouches-du-Rhône, 2005). She participated in the preparation and coordination of the European teams and in the evaluation with the European Commission. She has been involved in civil protection for 26 years (5 years in the French civil protection association, 8 years as a volunteer firefighter in 5 French departments) and she has been a professional officer for 18 years in the Bouches-du-Rhône Fire

Department (BDRFD). Since February, she has been working in VALABRE and in charge of the national Panoptes project, relating to the early detection and monitoring of forest fires and natural areas in France (in conjunction with the Ministries of the Environment, Interior and Agriculture). She exercises still the operational functions of incident commander in the field and chief officer at the BDRFD operational center

### Miguel Almeida



**Miguel Almeida** has a PhD in Mechanical Engineering in the expertise of wildfires. Since 2003, he has been at the Association for the Development of Industrial Aerodynamics (ADAI) at the University of Coimbra, Portugal, where he is a senior researcher.

He is author and co-author of several scientific and technical publications in the context of wildfires. In the same field, he has participated and coordinated several scientific projects and many contracts with the industry and the public sector. We highlight two works related to tourism coordinated by Miguel Almeida, contracted by the Portuguese Agency for Integrated Wildfire Management, where an analysis of fire risk in campsites, caravan parks and summer cultural festivals was made

### Giacomo Sbaragli



**Giacomo Sbaragli** has a Master degree in Forestry. He works at D.R.E.Am. Italia, a cooperative enterprise based in Tuscany oriented to support a sustainable development of the territory. He is a forest firefighter trainer at training centre "La Pineta" and in other Italian Regions. Expert in forest fires training and education, forest fires prevention planning, prescribed fire, meteorology applied to forest fires.

### Klaudijo Filcic



**Klaudijo Filcic** is a Fire Officer (FO-II, volunteer) with over 20 years of experience in leading and managing a Firefighting organization in Croatia; Firefighting Courses Team Leader and Training Officer on various forms of work with Firefighters, Youth and general public. Special interest in the development and improvement of work techniques and the application of new technologies in operational activities. Member of National Firefighting Workgroups and Committees

in regards of the research and introduction of modern ICT in Firefighting system and the development of training programs and SOPs.

Degree in Crisis Management; attended several Union Civil Protection Mechanism Courses - on introduction, operational and management level. Trained to work in complex rescue and humanitarian missions in an international environment with special emphasis on coordination, interoperability, self-sufficiency, communication, negotiation, leadership and management. Experience as a reinforcement staff at the European Center for Monitoring and Coordination during the summer Forest Fire season 2010 (DG-ECHO/MIC, Brussels). Participated in international Field Exercises as a trainee, role player, member of the Exercise Management Group, evaluator and EU Civil Protection Pool peer-certifier.

### Todor Stoyanov



**Todor Stoyanov** has a PhD in Administration and Management. Chef Assistant at the Department of Forest ecology at the Forest Research Institute, Bulgarian Academy of Sciences (Bulgaria). He has authored and co-authored numerous scientific and technical publications related to wildfires, forestry and circular bioeconomy. He has actively engaged in various scientific projects and training activities in these topics as a part-time lecturer of the University of Forestry, Sofia, dealing with forestry resilience, forest ecosystems vulnerability and adaptation, and sustainable forest management.

### Miltiadis Athanasiou



Miltiadis Athanasiou has Ph.D. in wildfire management from the University of the Aegean, Lesvos, (Greece). Private contractor and consultant in forest fire management and research affiliate at the Institute of Mediterranean Forest Ecosystems in Athens, Greece.

His scientific work includes documentation of wildfire behaviour and firefighting in the field, fire behaviour and fire safety analysis, especially for extreme fires, reconstruction of past firefighting accidents, fuel measurement and modelling, fire risk assessment and firefighting effectiveness analysis.

Teaching experience with the course "Topography and Geoinformatics in Disaster Relief and Rescue Operations" in the Hellenic Fire Academy and the course "Wildfires management" in two postgraduate programs at the National and Kapodistrian University of Athens (NKUA).

Trainer of professional and volunteer firefighters on wildfire behaviour, hazards, human factors, safety and health on the fire line, and forest firefighting tactics. Current projects involve the coordination of a pilot prescribed burning project in Chios island

(Greece) that aims to promote the use of fire for fire prevention in Greece.

Volunteer firefighter for twenty-three years. Since 2008, he is officially recognized as Specialized Volunteer Expert by the Hellenic General Secretariat of Civil Protection. Working experience in aerial firefighting, as crew member of heavy-lift (Type I) helicopters in Greece, flying for five (5) fire seasons.

### Turgay Dindaroglu



Turgay Dindaroglu, PhD, is a professor at the Forest Engineering Department at the Karadeniz Technical University, Trabzon (Turkey). He graduated with a Bachelor of Science in the Forest Engineering department from Karadeniz Technical University in 2000. He received his doctorate degree in Soil Science and Plant Nutrition from Ataturk University. In the past, he was an expert in the fight against forest fires (General Directorate of Forestry). Dr. Dindaroglu is involved in intensive teaching and research activities. His research interests include forest fire ecology, soil ecology, erosion, land degradation, karst ecosystems and desertification.

### 3. Presentations

An abstract of each of the presentations, as well as the printout of the slides shown during the workshop are reproduced here.

#### 3.1. The WUITIPS project overview, by Elsa Pastor

##### 3.1.1. Abstract

Forest fires in Europe increasingly affect populated areas, involving a serious civil protection challenge. People and assets at the wildland-urban interface (WUI) are exposed to fire and smoke hazard. In this context, tourism in WUI areas is particularly vulnerable. Tourists are generally unaware of fire risk while tourism-oriented buildings and facilities do not systematically contemplate their preparation for a forest fire impact. This is particularly evident in trans-boundary touristic regions, where population flows from one country to another and for which proper and effective collaboration between the implied responders is required but rarely present. As of today, no harmonized approach and actions for fire risk assessment of touristic areas is shared between neighbouring Member States: there is no harmonized understanding of the vulnerability of touristic areas nor common and coherent messages and recommendations of good practices for prevention and protection. WUITIPS aims to explore and characterize vulnerabilities and performance of risk mitigation measures in tourist facilities as well as the associated population in emergencies due to forest fires in cross-border situations across EU. With this knowledge captured, WUITIPS will develop an EU harmonized guideline for fire prevention and protection planning in touristic infrastructures, together with new methods and tools to analyze vulnerability of assets and people. These products will be demonstrated in cross-border Spain-France pilots. An extension to other EU transboundary areas will be possible thanks to the co-participatory process of the WUITIPS living lab of knowledge transfer along the project lifetime. Counting on continuous feed-back from key members from different EU regions, already identified wildfire-prone cross-border touristic areas will be also incorporated in the WUITIPS rationale to ensure a direct transfer and applicability of the EU harmonized guideline and risk assessment methods.

##### 3.1.2. Presentation printout

The image shows a presentation slide titled "WUITIPS – Project Overview" by Elsa Pastor. The slide features the WUITIPS logo on the left, which consists of a blue map of Europe with a yellow flame rising from it. The slide is co-funded by the European Union, as indicated by the logo in the top left corner. The project is identified as "Project: 101101169 — WUITIPS — UCPM-2022-PP". The slide also includes logos for the following institutions: Universitat Politècnica de Catalunya (UPC), Centre for Technological Risk Studies, Diputació de Girona, Efectis, VALABRE (ANEXOS MONTES PROTEGITS), and LUND UNIVERSITY.

Co-funded by the European Union Project: 101101169 — WUITIPS — UCPM-2022-PP

## BASIC INFORMATION

- Project full name: Wildland-Urban-Interface fire Touristic Infrastructures Protection Solutions
- Duration: 2 years (01/02/2023 – 31/01/2025)
- DG-ECHO funded (Prev. Prep. Projects on Civil Protection and Marine Pollution - (UCPM-2022-PP))
- Consortium
  - Universitat Politècnica de Catalunya - UPC (Coord.) – Spain
  - Diputació de Girona (DDGI) – Spain
  - Efectis France (EFR) – France
  - Entente pour la forêt Méditerranéenne (EPLFM) – France
  - Lunds Universitet (ULUND) - Sweden




3

Co-funded by the European Union Project: 101101169 — WUITIPS — UCPM-2022-PP

## BACKGROUND AND NEEDS

- Extreme wildfires are an increasing problem across the world and particularly in Europe, involving a serious civil protection challenge
- Wildfires pose a growing threat to tourist destinations at the Wildland-Urban Interface (WUI), particularly in the Mediterranean Europe
  - Tourists are generally unaware of fire risk
  - Tourism-oriented facilities do not systematically contemplate their preparation for a forest fire impact
  - This is particularly evident in trans-boundary touristic regions
- No harmonised approach and actions for fire risk assessment of touristic areas is shared between neighbouring Member States:
  - No harmonized understanding of the vulnerability of touristic areas
  - Nor common and coherent messages and recommendations of good practices for prevention and protection.



Top: Agullana, 2012. Source: DDGI  
Bottom: Le Lavandou, 2017. Source: Claud Paris AP

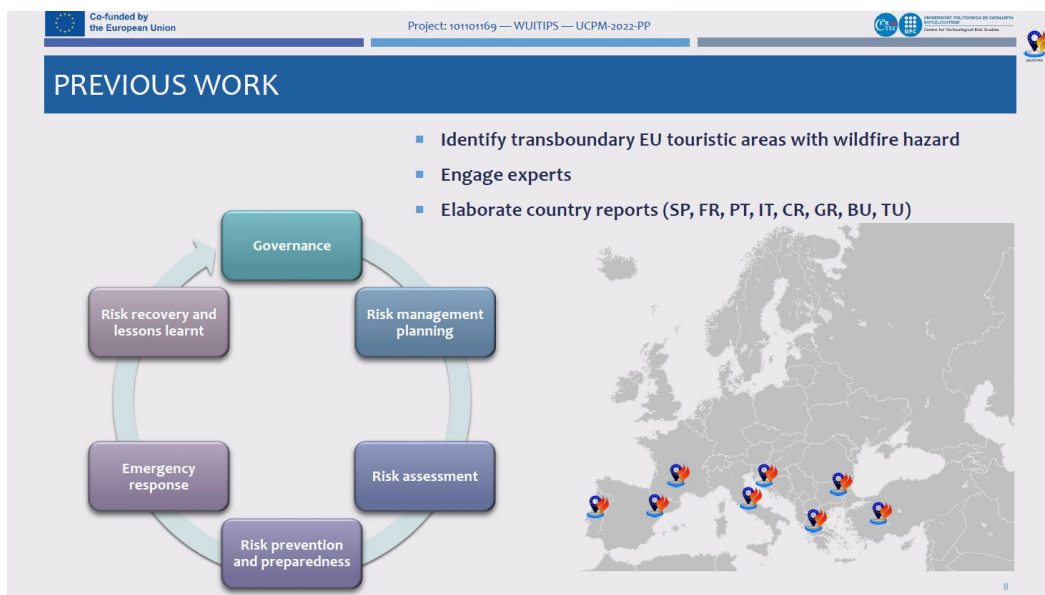
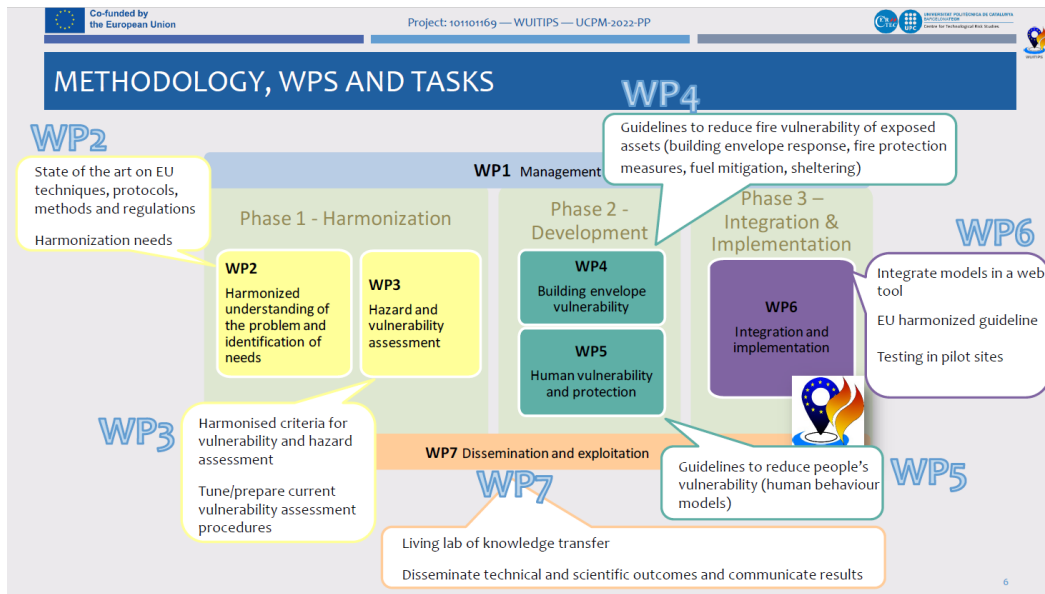
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Co-funded by the European Union Project: 101101169 — WUITIPS — UCPM-2022-PP

## AIM AND OBJECTIVES

- WUITIPS aims to explore, identify and characterize vulnerabilities and performance of risk mitigation measures in tourist facilities as well as the associated population, in emergencies due to forest fires in cross-border situations across EU. With this knowledge captured, WUITIPS will...
  - Develop standard methodologies for wildfire vulnerability analysis of assets and people in touristic infrastructures
  - Elaborate an EU harmonized guideline for fire prevention and protection planning in touristic infrastructures
  - Provide end-users with examples of application of products in pilot sites.
  - Create a living lab of knowledge transfer with a complete ecosystem of stakeholders and end-users across EU

5



## 3.2. The DG-ECHO Wildfire Prevention Action Plan, by Cristina Brailescu

### 3.2.1. Abstract

The 2022 wildfire season confirmed an upward trend in intense wildfires, with more wildfire events occurred and more forestland burnt than in previous years. Both 2021 and 2022 also saw a high number of Member States requests under the Union Civil Protection Mechanism (UCPM) for assistance with wildfires. With climate change, this upward trend in wildfire intensity is expected to exacerbate in the future and the need to safeguard out forests from wildfires will grow. Member States have repeatedly expressed support to intensify efforts to prevent wildfires, in addition to improved response and preparedness, including at the informal Ministerial meeting on reinforcing wildfire preparedness and response in Brussels in September 2022. To facilitate these efforts and help better manage forests and landscapes, reduce the ignition of fires in the first place and limit their impacts, the Commission has put forward a new wildfire prevention action plan. This plan will make full use of the tools under the EU Civil Protection Mechanism, including the Union disaster resilience goals planned to be adopted by the end of 2022. It will complement the preparedness efforts under rescEU and will build on other EU initiatives, such as the EU Forest Strategy. The proposed actions are organised around three themes, which will help safeguard our forests from wildfires: i) improved capacity to prevent wildfires, ii) improved knowledge on wildfires for prevention, and iii) increased financing for wildfire prevention actions. The plan will be taken forward through reinforced dialogue and cooperation with the Member States on these actions, with clear legal base and proposed deliverables.

### 3.2.2. Presentation printout





## Wildfire prevention action plan

- The 2021 and 2022 wildfire seasons have been severe – an urgent need to also PREVENT wildfires
- A « Wildfire prevention action plan » was drawn up DG ECHO, to enhance wildfire prevention efforts
- Existing legal mandate of the UCPM decision (art 5 & 6)
- Promoting intergrated wildfire risk management : long term and short term actions
- Wildfire prevention in focus combined with multi-hazard approach
- Complements existing guidelines and other EU policies and various ongoing initiatives
- Role of the Knowledge Network across actions

### WILDFIRE PREVENTION ACTION PLAN

#### Capacity

1. Peer reviews
2. Disaster resilience goals & scenarios
3. Good practice guide on wildfire prevention
4. Good practice guide on wildfire awareness
5. EU risk wildfire awareness actions
6. Constructive dialogue under UCPM (art 6.4)

#### Knowledge

7. Economics of prevention
8. Risk assessment & mapping

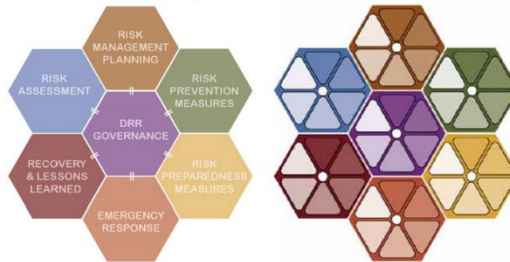
#### Financing

9. DRG Grants (annual calls)
10. Increase investments through EU funding

2

## Action 1. Targeted peer reviews to reinforce capacity in wildfire prevention

### Peer Review Assessment Framework (PRAF)



There are **seven areas of analysis** which the host country can choose from to specify the scope of the peer review. Emergency response and post-emergency recovery refer to ex-post review of recent disasters. Each area of analysis is made up of six **topics** (wedges) describing the thematic area of analysis in further detail. The host may opt out of some of the subtopics from the chosen thematic area.



The host country can choose the focus of the peer review that best addresses its needs. A **comprehensive review** covers all thematic areas, whereas **targeted review** can focus on risk assessment, risk management planning, or any of the risk management topics: prevention, preparedness, emergency response, and/or post-disaster recovery.



## Action 1. Targeted peer reviews to reinforce capacity in wildfire prevention



## Targeted wildfire peer reviews



- Provide a country/region with an excellent opportunity to reflect on its readiness to cope with natural and human-induced related disasters and to identify ways of improving risk management systems and Disaster Risk Management (DRM) capabilities
- **Wildfire peer review assessment framework will be released in early June**
  - It could also be used as a self-assessment tool
- A call for volunteers (countries or regions) will be launched in June, for two peer reviews to be carried out in autumn 2023 – spring 2024
  - Important to pilot the assessment framework, and improve it



### Action 2. Disaster Resilience Goals & scenarios

#### Five goals to strengthen EU's overall resilience

Anticipate Prepare Alert Respond Secure

European Union

#### And five flagship initiatives to support implementation

Adopted 8.2.2023

Commission [Recommendation](#) and [Annex](#) available all EU official languages [here](#)

Commission [Communication](#) available in all EU official languages [here](#)



<p><b>1. Anticipate</b></p> <p>Improving risk assessment, anticipation and disaster risk management planning</p>	<p><b>2. Prepare</b></p> <p>Increasing risk awareness and preparedness of the population</p>	<p><b>3. Alert</b></p> <p>Enhancing early warning</p>	<p><b>4. Respond</b></p> <p>Enhancing the Union Civil Protection Mechanism response capacity</p>	<p><b>5. Secure</b></p> <p>Ensuring a robust civil protection system</p>
<p>✓</p> <p><b>Flagship</b></p> <p>Europe-wide disaster scenarios</p>	<p>✓</p> <p><b>Flagship</b></p> <p>"preparEU": A pan-European awareness programme for disaster resilience</p>	<p>✓</p> <p><b>Flagship</b></p> <p>Linking global early warning with local action in Europe</p>	<p>✓</p> <p><b>Flagship</b></p> <p>Scaling-up rescEU strategic reserve</p>	<p>✓</p> <p><b>Flagship</b></p> <p>Stress-testing the emergency operation centres across Europe</p>





## Respond - Enhancing the Union Civil Protection Mechanism's response capacity

To further develop, by 2024, the Union Mechanism's response capacity in the areas of response to wildfire, flood, search and rescue needs, chemical, biological, radiological and nuclear events (CBRN) and emergency health. Moreover, by 2024, this goal and its specific objectives will be further developed and capacities added in areas such as temporary shelter, emergency energy supplies and transport.

4.1. Wildfire response

4.2 Flood response

4.3. Search and rescue response

4.4. CBRN response

4.5. Emergency health response



### Action 4. Wildfire risk awareness communication activities

96 % of fires are related with human activities

⇒ increasing risk awareness among the population is critical for wildfire prevention.

⇒ DG ECHO launched a collection of good practices: Online survey - December / February

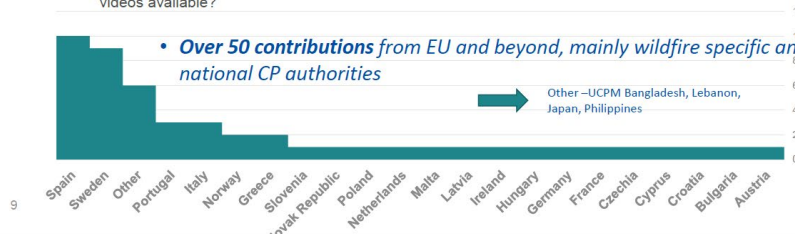
#### 1. Emergency and crisis communication

- How do you communicate on wildfire preparedness actions, how do alert / warn the population (sirens, app...), how do you communicate evacuation plans, do you have codes of conducts? Do you have exercises in place, other?

#### 2. Risk awareness communication

- How do you include wildfire risk in your online platform, risk Atlas (map), risk awareness campaigns, education in schools? Do you organize events? Do you have brochures, leaflets or videos available?

• Over 50 contributions from EU and beyond, mainly wildfire specific and from national CP authorities



### Risk awareness campaigns

#### Examples

ITALY - I don't take risks campaign



ITALY - I don't take risks "School"

AUSTRIA – Educational material



GERMANY - "E2Wald" declares war on forest fires



PORTUGAL - "Safe Village, Safe People" Programme



POLAND - "Stop grass fires" campaign



SLOVENIA - Month of Fire Safety – ex. 2020 fire safety on holidays and leisure



IRELAND – Be Summer ready



CROATIA - Paint it Back – forest fire awareness campaign – Scout association (volunteers)



## Enhancing risk awareness: reliable information

### Examples

**Ignition fire ban**

SWEDEN - [Regulations on fire bans - Guidance document](#) ignition fire ban

SWEDEN - [Lighting Fires and the Right of Public Access - \(pdf\)](#)

HUNGARY - [Fire ban Ban on lighting fires](#)

**Vegetation waste treatment**

SWEDEN - [Forestry's guidelines for risk management](#)

HUNGARY - [Prevention of agricultural and wildfires](#)

CROATIA - [Croatian Firefighting Association - TV-and radio spots](#)

CYPRUS - [Fire Safety Guide](#)

**Self-protection measures**

PORTUGAL - ["Safe Village, Safe People" Programme Torres Vedras Municipality \(PT\)](#):

- If you are near a fire
- After a fire is extinguished...

FRANCE [Communication toolkit](#)

Posters, leaflets, videos, etc., ready to be used

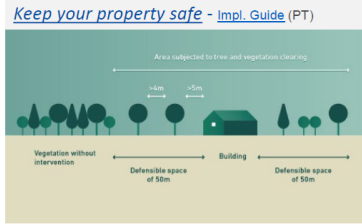
Ministry of ecological transition and territorial cohesion

**Wildfire exacerbating factors**

FRANCE [Drought: exacerbation factor](#)

SWEDEN - [Fire fuel web-based map](#)

IRELAND - [Fire Danger Notice](#)



SWEDEN [Fire Danger Outdoors app](#)



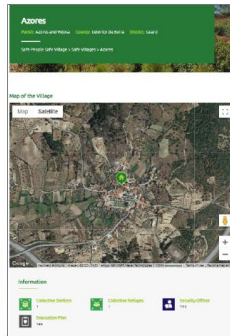
## Enhancing preparedness: evacuation plans

Reach out to as many people as possible: *Notification signs / Information panels, Door-to-door, Sirens, Loudspeakers, Church bells, Local radio stations, Web-TV, Landline telephone, SMS, Social media*

800 awareness actions  
Network of municipalities and parishes  
GIS system to map communities, shelters, refuges, presence of officers and plans

*This risk awareness campaign has reached:*  
> 30.000 citizens; > 2200 villages; > 2000 Local Safety Officers nominated; > 2600 shelters or refuge implemented; 900 evacuation plans implemented

### The example of Portugal



[Guide to support the implementation of the Safe People Safe Village program \(pdf\)](#)



## Way forward – wildfire risk awareness

Tender - with three objectives :

1. **Further analyse** to highlight strengths, weaknesses, gaps, trends of the practices – **to produce a publication**
2. **Propose a Commission approach** to support wildfire risk awareness activities carried out at MS-level in a way that their impact is amplified and effective “EU value added” is ensured
3. **Advise on a possible pilot pan-European wildfire risk awareness initiative**, as part of 2024 Commission approach



## Action 9. UCPM funding opportunities - 2023 calls

### Technical Assistance for Disaster Risk Management (ex-Track 1)

### Knowledge for Action in Prevention and Preparedness (KAPP)

- **Reframing the Prevention and Preparedness programme:**

- Administrative simplification + efficiency
- Highest added value possible for the entire UCPM
- High quality projects financed

- **Alignment with the Disaster Resilience Goals**



## I) Technical Assistance for Disaster Risk Management (ex Track 1)

### Overall objective

Supporting capacity building activities for DRM authorities: preparing investments & strengthening the institutional and policy framework

### Eligible countries

- EU Member States
- UCPM participating states
- Other countries: Georgia, the Republic of Moldova, Ukraine, and Kosovo.

- EUR 6.5 million (including €2 million from NGEU, for projects focusing on health crisis preparedness – Priority 4)

- **Maximum EU contribution per project:** € 750 000

- Invitations and opening for proposal submission on the Funding and Tender opportunities portal: 8 March 2023
- Deadline to submit proposals: **24 May 2023**
- Info day: 23 March 2023



## II) Knowledge for Action in Prevention and Preparedness

### Overall objective

Co-funding activities in UCPM member and participating states, IPA and eligible neighbouring countries, to support disaster prevention and preparedness, and to provide a testing environment and a learning opportunity through full-scale field exercises. The activities will support implementation of the Union disaster resilience goals.

### Topic 1. Prevention:

- Priority 1: Risk assessments, anticipation and risk management planning
- Priority 2: Risk awareness
- Priority 3: Early warning
- Priority 4: Wildfire prevention

### Topic 2. Preparedness:

- Priority 1: Institutional preparedness
- Priority 2: Individual capacity strengthening

### Topic 3. Full-scale exercises

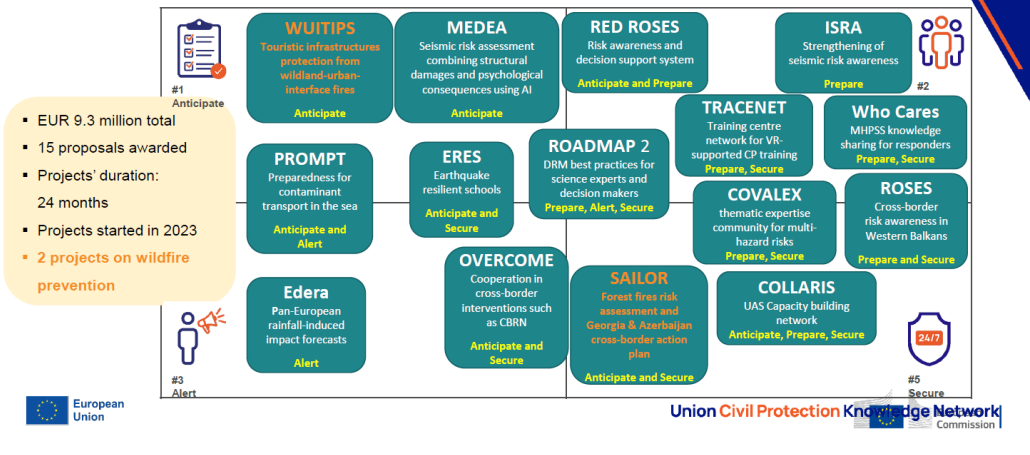
- Total of € 15 million (€ 7 million for Prevention, € 5 million for Preparedness and € 3 million for Full-scale exercises)

- **Max EU Contribution per project:** € 1 million

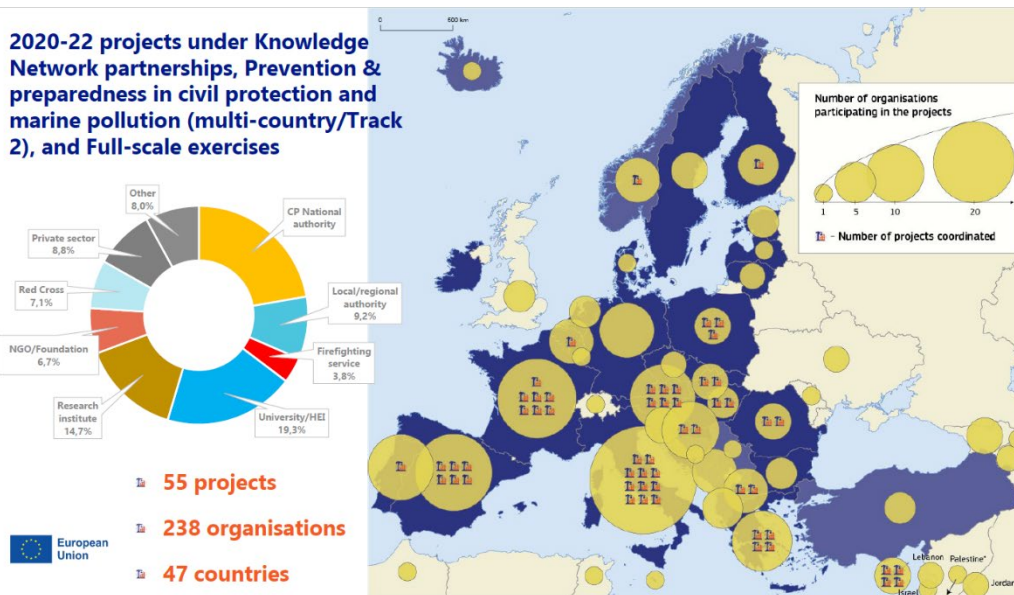
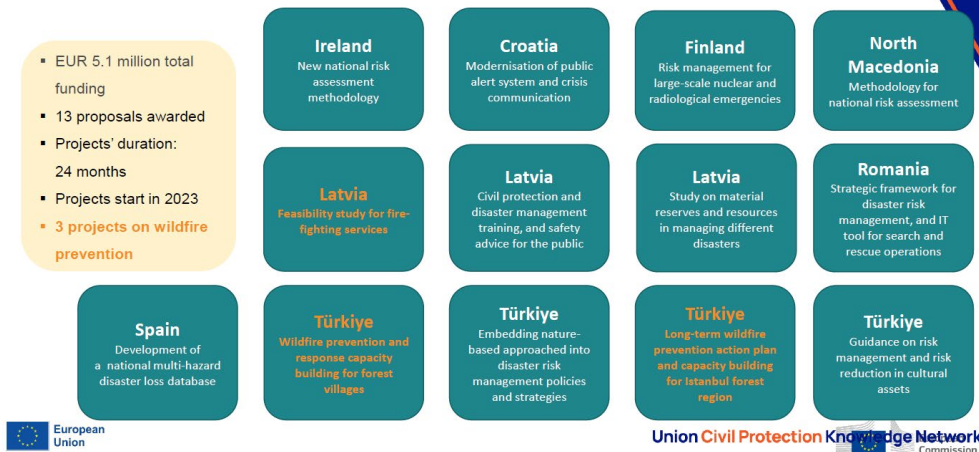
- Deadline to submit proposals: 4 May 2023
- Info day: 10 March 2023 [KAPP|UCP Knowledge Network](#):
- Support letter from national CP authorities (mandatory)
- Declarations by partners confirming interest (mandatory for topics 1 and 2)
- 3 entities from 3 eligible countries



## 2022 Call multi-country grants for prevention and preparedness in civil protection (Track 2), Knowledge Network Partnership call 2022



## 2022 Call for single country grants for disaster risk management (Track 1)



## What we expect from WUITIPS

It contributes to the implementation of the DRGs 1 (development of preventative actions) and 2 (population preparedness)

- Deliverables are prepared so that they are easily understood by people outside the project pilot areas or project partners, to ensure replicability
- Scalability to other regions & tourism sector more broadly
- Take into account other initiatives in progress at the same time and adapt to the remaining gaps



## Thank you

[cristina.brailescu@ec.europa.eu](mailto:cristina.brailescu@ec.europa.eu)



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Slide xx: element concerned, source: e.g. Fotolia.com; Slide xx: element concerned, source: e.g. iStock.com



### 3.3. Survey on the state-of the art of WUI fire management in Girona (Spain), by Maria Pipió

#### 3.3.1. Abstract

Girona is a wildfire prone area, with Alt Empordà experiencing the highest occurrence of large fires (e.g., fires during 1986 burnt 21,000 ha; in 2000 the burnt area was around 5,600 ha and in 2012, there were 12,000 ha affected). These fires are typically driven by wind and topography, often propelled by northerly winds, and exhibit significant spotting capacity. Girona province is highly frequented by tourists (with around 4 million visitors each year) with more than 1,000 touristic infrastructures. Having that in mind, a relevant case study for the WUITIPS project is the fire that took place near the French border in Pertús in July 2012. This fire rapidly spread due to strong northerly winds, overwhelming the capacity of fire services, including aerial support, which could not be deployed in time. Just seven hours after the initial fire, a second wildfire started in the nearby town of Portbou, causing a complete traffic collapse. Tragically, during these events, two French tourists lost their lives while attempting to escape the flames, around 2,000 people had to be evacuated, and the fire impacted 18 municipalities. The lessons learned from this fire highlighted various gaps, needs, and issues that could be addressed and improved upon. These include coordination challenges with the French fire service, the necessity for evacuation drills, the assessment of fire safety measures' performance (e.g., fuel reduction strategies) for high-intensity fires, and the establishment of a fire management strategy to minimize the blockage of borders.

#### 3.3.2. Presentation printout

Co-funded by the European Union Project: 101101169 — WUITIPS — UCPM-2022-PP

**Region: Catalonia / Girona (Spain)**

**María Pipió (DDGI) & Jaume Llonell (DDGI)**

**WUITIPS – Workshop 1**

CRTEC UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH Centre for Technological Risk Studies

Diputació de Girona

Efectis

VALABRE ANTI-CRIMINAL PRESENT

LUND UNIVERSITY

*Towards and harmonized framework for cross-border fire management in touristic infrastructures*


WUITIPS Workshop 1 – May 11th 2023



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## PRESENTATION OF THE EXPERTS

- Local coordinator: Maria Pipió (Forest engineer specialist in forest fire prevention, Diputació de Girona)
- Contributors:
  - Jaume Llunell (GIS specialist, Diputació de Girona)
  - Edgar Nebot (Deputy inspector of Catalan Fire And Rescue Service, Government of Catalonia)
  - Enric Cano (Deputy inspector of Catalan Fire And Rescue Service, Government of Catalonia)
  - Ramon Noguer (Specialist technician in civil protection and fire prevention of the Alt Empordà County Council)
  - José Ángel Terés (Head of the Forest Fire Prevention Management Section, Government of Catalonia)
  - Elsa Pastor (WUITIPS coordinator, prof. at UPC)
- Catalunya / Girona (SP-FR border)



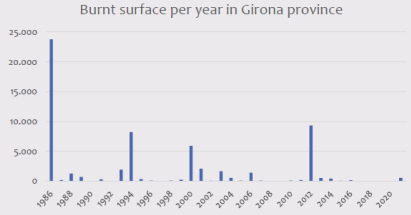
5,910 km<sup>2</sup>  
786.596 inhabitants

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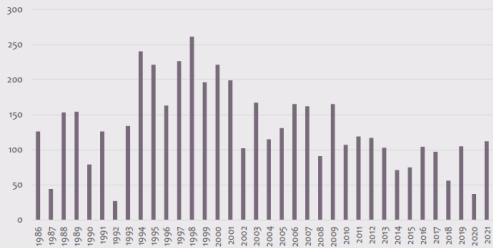
Co-funded by the European Union Project: 101101169 — WUITIPS — UCPM-2022-PP

## FIRE REGIME

- General fire statistics in Girona province
  - Alt Empordà 1986 (21.000ha), 2000 (5.600ha) i 2012 (14.000ha)
  - Selva 1994 (7.300ha)



Source: Forest Fire Prevention Management Section, Government of Catalonia



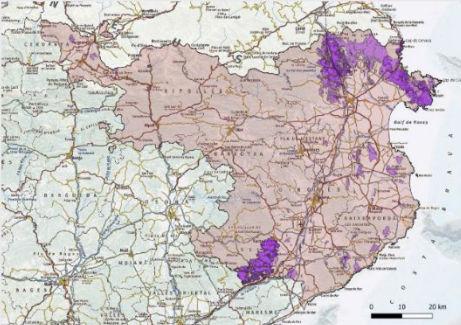
Source: Forest Fire Prevention Management Section, Government of Catalonia

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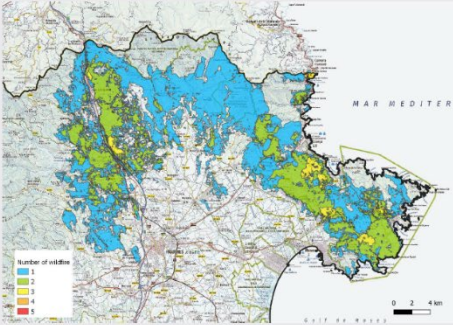
## FIRE REGIME

Fire perimeters (1986-2021)



Source: Forest Fire Prevention Management Section, Government of Catalonia

Fire recurrence (1986-2021)



Source: Forest Fire Prevention Management Section, Government of Catalonia

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## FIRE REGIME

- Type of fires
  - Wind/topography driven fire
    - ✓ Wind interaction with topography and fuel availability.
    - ✓ The head of the fire aligns with the wind's maximum speed line.
    - ✓ Fire head usually exceed suppression capacity and spreads with large spotting activity
    - ✓ The final phase of these fires, when the general wind disappears, is still complicated as topographic winds may increase fire activity in flanks and back.
  - Return period: 26 to 180 years

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## FIRES IN TOURISTIC INFRASTRUCTURES

Touristic infrastructure	Number of establishments	Number of seats
Hotels & resorts	913	83,957
Campsites	145	132.045
Flat	113	6.352
Tourist housing (including agroturism)	42.064	-
Motor home areas	out-of-date data	-

**Total visitors 2022: 3,908,018 (1,853,227 domestic tourists and 2,054,791 foreign tourists).**  
**Total visitors 2019: 4,014,134 (1,717,387 domestic tourists and 2,306,352 foreign tourists).**  
 Source: IDESCAT & INE

Població estacional ETCA (Equivalent a temps complet anual): Comarques I Aren, 2021

Font: Idescat. Estimacions de població estacional (base 2016).

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## CASE STUDY: 2 SIMULTANEOUS FIRES ON THE FRENCH BORDER (JULY 2012)

- What happened:
  - ✓ 12:00 fire is declared in the French border (Pertús) caused by a cigarette. Very adverse weather conditions.
  - ✓ The fire progresses rapidly at 2 km/h with peaks of 8 km/h driven by the strong Northerly winds.
  - ✓ Catalan, Spanish, French and Andorran resources were used.
  - ✓ Aerial means cannot not be deployed due to strong winds and smoke.
  - ✓ 19:00h a second fire is declared in the alternative cross-border road (Portbou), also lighted by a cigarette.
  - ✓ Traffic collapse: People surrounded by flames, abandoned their vehicles and run down to the sea.
- Main touristic consequences:
  - ✓ Full evacuation of a camping that burned down totally (Capmany).
  - ✓ 2 French citizens lost their lives by falling down a cliff.
  - ✓ Traffic at the 3 main communication axes were cut off more than 36 hours (AP7, N-II, rail traffic).
  - ✓ 18 municipalities were affected by the fire.
  - ✓ 68 municipalities were confined.
  - ✓ 2.000 people were evacuated and spent the night in municipal facilities, including tourists.

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Wildfire approaching the urban center of Agullana (26/7/2012)




Portbou wildfire (26/7/2012)

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### FIRES IN TOURISTIC INFRASTRUCTURES

Area	Shortcoming / need / gap
Governance	Proposal to extend the Fire Prevention Law in WUI to all vulnerable elements of the territory. Modification of the law carried out in 2014.
Risk management planning	Need to take preventive measures to avoid blocking the borders. Strategic management points, water points and road systems.
Risk assessment	Need to differentiate the efficiency and safety of the measures determined by the Law for medium intensity fires that are inefficient in high intensity fires. Good design and sizing of prevention measures.
Risk prevention and preparedness	Need to carry out evacuation drills. Evidence of a lack of a culture of self-protection and how to act in a fire event. Training on first aid, self-protection, confinement or safe evacuation. Knowledge about vegetation species and structures that facilitate the passage of fire to the house.
Emergency response	Coordination problems with firefighters from other countries: language, communication and mapping problems. Simultaneous fires. Difficulty in accessing the fire due to the large number of vehicles stuck on the roads. First hours of the fire devoted to evacuating people, confinement and protection of vulnerable elements.
Risk recovery	Perception of chaos by residents. Complaints about emergency management. Increased blame and responsibility. Recognition that many improvements need to be made in both prevention and suppression.

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### 3.4. Survey on the state-of the art of WUI fire management in Département des Pyrénées Orientales (France), by Mohamad El Houssami and Marjorie Sampsoni

#### 3.4.1. Abstract

The Département des Pyrénées Orientales, which shares a border with Spain, is an area prone to recurrent forest fires, occasionally extending across the border. As a popular tourist destination, particularly during the summer months, the management of tourists has been significantly impacted by numerous forest fires. The case study that has been presented within the framework of the WUITIPS project is a recent wildfire that started at Cerbère and Banyuls-sur-Mer and spread to Portbou due to strong northerly winds. The fire affected approximately 930 hectares in France and around 150 hectares in Spain, resulting in the evacuation of over 300 individuals and the confinement of around 1000 people in their homes.

This specific case shed light on several gaps and needs within the current state of the art, which can be summarized as follows: challenges in interoperability and standardization among departments, limited compliance with vegetation clearing measures by individuals, the absence of assessments on the defensibility capabilities of homes in the Wildland-Urban Interface (WUI), and difficulties in effectively raising awareness, particularly among tourists.

#### 3.4.2. Presentation printout



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## PRESENTATION OF THE EXPERTS

- Local coordinator: Philippe Meresse (senior firefighter officer, director of the new technologies cluster department of EPLFM Valabre)
- Contributors:
  - François Pradon (senior firefighter officer, national chief of staff, Ministry of the Interior)
  - Fabrice Chassagne (senior firefighter officer, national forest fire referent, Ministry of the Interior)
  - Jean-Yves Noisette (senior firefighter officer, south area fire department director)
  - Eric Belgioino, (senior firefighter officer, Pyrénées Orientales fire department director)
  - Serge Peyre (Forest fire prevention project manager, Pyrénées Orientales Departmental council)
  - Jean-Marc Pacull (deputy mayor of Le Boulou municipality, urban planner)
  - Bruno Guillaume (senior project manager, forest fire research and innovation, Efectis France)
  - Mohamad El Houssami (Ph.D, project manager fire engineering department, Efectis France)
  - Frédérique Giroud (Ph. D, director of research center department of EPLFM Valabre)
  - Marjorie Sampsoni (senior firefighter officer, wildfire project manager of EPLFM Valabre)

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2

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## PRESENTATION OF PYRENEES ORIENTALES DEPARTMENT

4.116 km<sup>2</sup>  
482.675 inhabitants  
>1 million in summer

The map displays the Pyrénées Orientales department in France, bordered by Aude to the north, Ariège to the west, Andorra to the southwest, and Spain to the south. It is divided into 15 cantons: La Vallée de l'Aglly, La Côte Sabartoise, La Vallée de la Vézère, Le Biterrois, La Vallée de la Vézère, Les Agnès, Les Agnès d'Ilhéus, La Vallée de la Vézère, La Vallée de la Vézère, Les Agnès, La Vallée de la Vézère, Les Agnès, La Vallée de la Vézère, Les Agnès, and La Vallée de la Vézère.

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## STUDY CASE: WILDFIRE OF APRIL 16, 2023


The photograph shows a massive wildfire with thick, billowing white and grey smoke rising into a clear blue sky. The fire is situated on a hillside overlooking a coastal town with terracotta-roofed buildings and a marina with numerous sailboats. The sea is a vibrant blue in the foreground.

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## STUDY CASE: WILDFIRE OF APRIL 16, 2023


- Started at Cerbère & Banyuls-sur-Mer (France) to Portbou (Spain)
- Strong wind s
- Burned surfaces in France: 930ha
- More than 300 people evacuated (Cerbères...)
- A lot of people confined
- 500 firefighters from France deployed



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## FOCUS ON WILDLAND URBAN INTERFACE



Legal obligations clearing vegetation

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## EXAMPLE OF LEGAL OBLIGATIONS CLEARING VEGETATION

“Obligations Légales de Débroussaillage” (OLD)  
Legal obligations clearing vegetation



WUITIPS Kick-off Meeting – 09/03/2023 7

SUMMARY OF CURRENT SITUATION	
Area	State of the art
Governance	National regulation is applied in the departments Each department is autonomous Difficulty: interoperability and standardization between departments
Risk management planning	Multiple national and departmental plans and guides are applied Difficulty: compliance with regulation by individuals for legal obligations clearing vegetation (OLD)
Risk assessment	Prevention plans are existing as well as fire risk maps but there is no assessment of the defensibility
Risk prevention and preparedness	Numerous prevention campaigns (ministry, departments, municipalities, fire departments, schools...) Training (firefighter, municipalities) Difficulty: raising awareness for tourists...
Emergency response	Early detection and massive attack on incipient fires Preventive prepositioning of firefighting resources according to level of risk Use of armed areal guards and massive use of water bombers Confinement of residents over evacuation
Risk recovery	Towns and departments organize recovery of impacted residents

### 3.5. Survey on the state-of the art of WUI fire management in Portugal, by Miguel Almeida

#### 3.5.1. Abstract

Portugal holds the unfortunate distinction of being the country in Europe with the highest annual area devastated by wildfires. Over the past 50 years, both the number of fires and the hectares affected have been steadily increasing. Following the devastating wildfire season of 2017, Portugal took a significant step forward by enhancing its legislation. The country now aims to establish an explicit and integrated wildfire management system, which includes upgraded fuel management requirements, stricter building restrictions in fire-prone areas, and other relevant measures.

A noteworthy case study relevant to the WUITIPS project proposed by Portugal involves a fire that occurred during a music festival in August 2016. The festival boasted a crowd of 3,500 attendees, including 20% foreigners, who had to be evacuated. Thankfully, there were no casualties, but the fire impacted on over 500 vehicles, with a majority of them being completely destroyed. The ignition point was identified at the festival's parking area, and only through the establishment of firebreaks, supported by extensive aerial resources, was the fire's spread successfully halted. The absence of fuel management in the area led to a dangerous situation with cars surrounded by dry grass fuels readily available to burn. Lessons learned from this incident highlighted that citizens and tourists often feel compelled to assist during emergencies, yet their involvement can put them at risk. Additionally, panic or individual strategies have the potential to undermine coordinated operations. Furthermore, volunteers and temporary staff may not possess the necessary training to effectively manage large-scale emergencies, a challenge shared by many personnel working in tourist infrastructures. Following the fire, some tourists chose to leave the event area, while foreigners who suffered losses typically opted to remain. Accommodating thousands of people proved to be a daunting task. Additionally, reliable communication systems emerged as indispensable services during such incidents.

#### 3.5.2. Presentation printout

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**Country: Portugal**

**Miguel Almeida (ADAI)**  
(miguelalmeida@adai.pt)

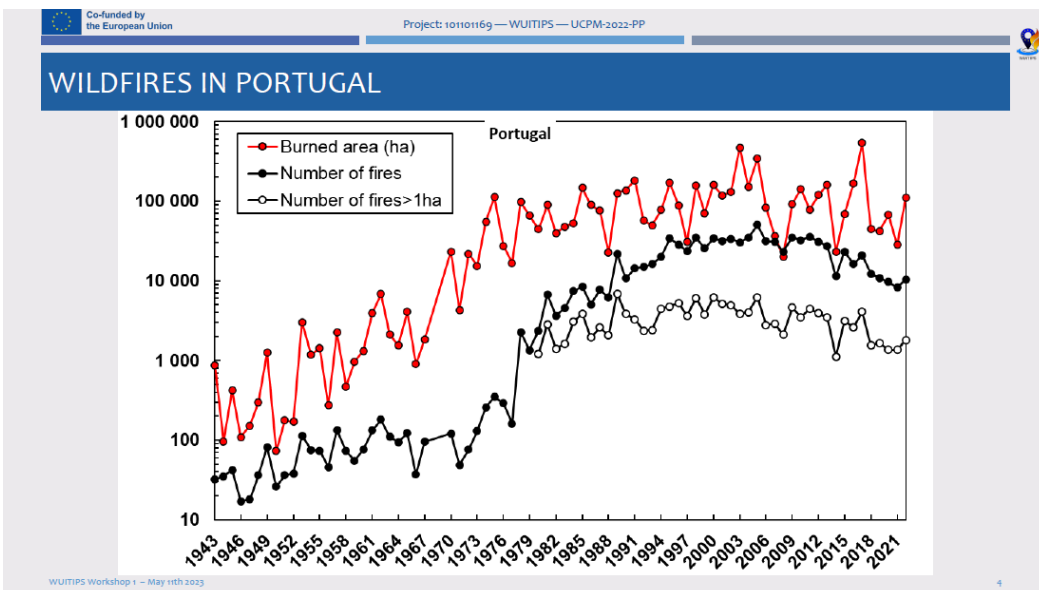
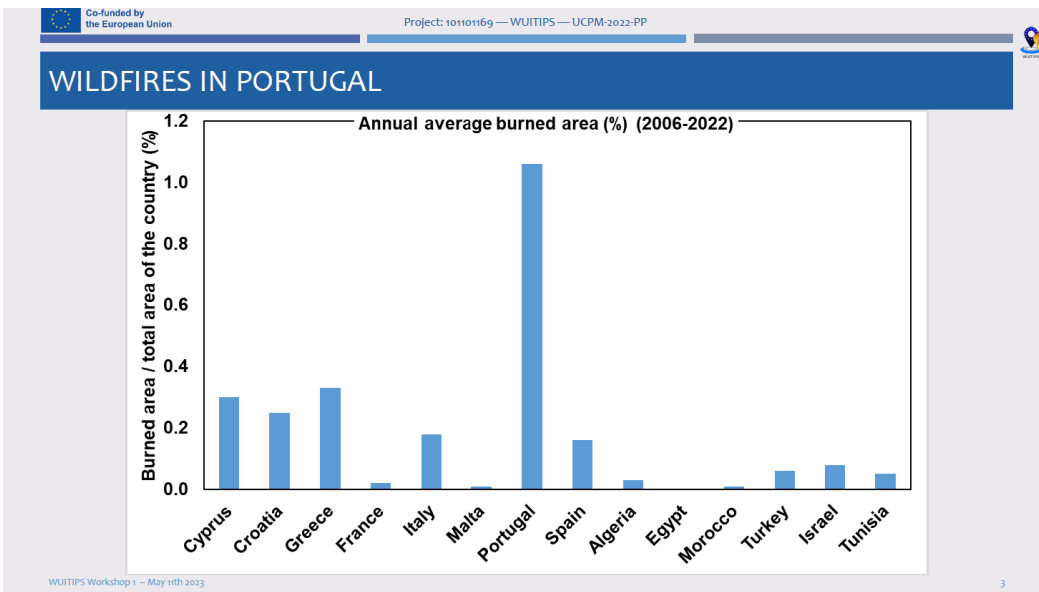
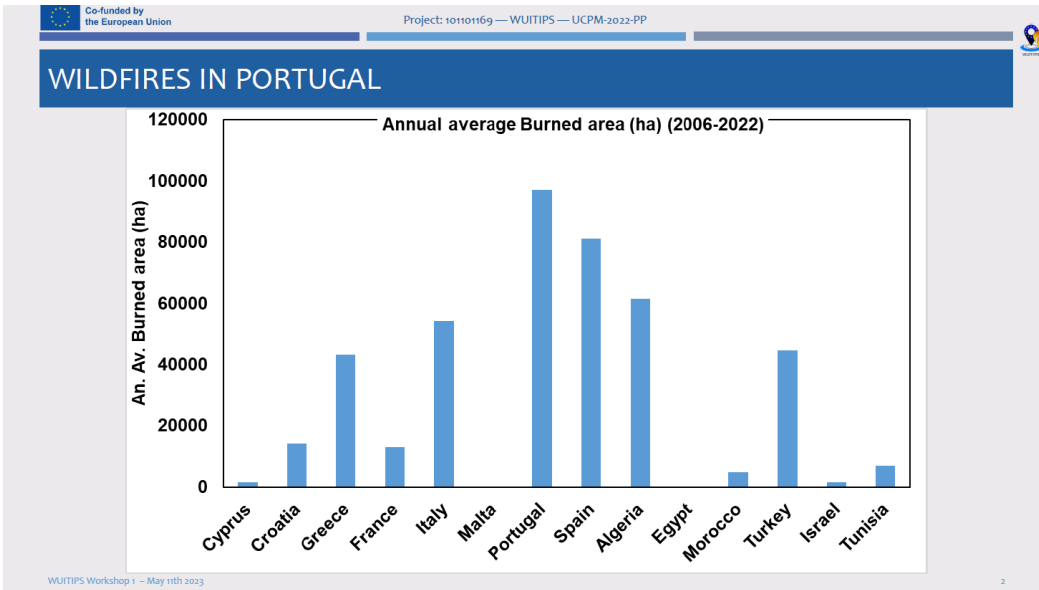
**WUITIPS**

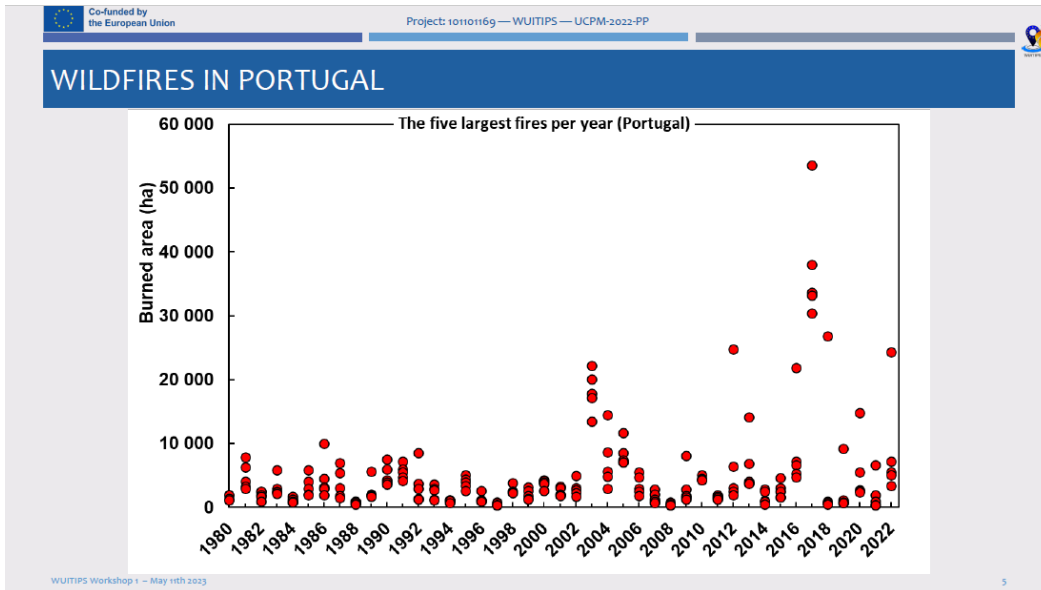
**WUITIPS – Workshop 1**

**Towards and harmonized framework for cross-border fire management in touristic infrastructures**

WUITIPS Workshop 1 – May 11th 2023







Co-funded by the European Union | Project: 101101169 — WUITIPS — UCPM-2022-PP

## LEGISLATION RELATING WILDFIRES AND TOURISTIC INFRASTRUCTURES

**Principal legislation**    **Shortcoming / need / gap**

DL 82/2021

**Integrated Wildfire Management System**

- Secondary fuel management strips in the network can reduce the effects of wildfires and isolate potential fire outbreaks
  - Hotels, camping and caravan sites, leisure and recreational parks, and other infrastructure should have a surrounding fuel management strip  $\geq 100\text{m}$  wide
- Inside APPS (areas with high and very high fire risk) – new constructions are not allowed, and reconstruction of infrastructure is only allowed if specific measures are taken:
  - The distance from the edge of the property must be  $\geq 50/100\text{m}$ .
  - Measures to minimize the wildfire impacts, including a  $50/100\text{ m}$  wide fuel management strip around the building.
  - Adoption of protective measures relating to the building's resistance to the passage of fire
  - Adoption of measures to contain possible fire outbreaks in the building and its surroundings
  - ...
- Outside of APPS – new constructions are allowed if they meet the same rules as above.
  - "In the extension work of buildings for residential and rural tourism, the width of the fuel management strip and the distance to the edge of the property may be reduced to  $10\text{ m}$ ."

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## LEGISLATION RELATING WILDFIRES AND TOURISTIC INFRASTRUCTURES

**Principal legislation**    **Shortcoming / need / gap**

DL220/2008 and Administrative Rule 1532/2008

**Safety against fires (not wildfires) in buildings (and outdoor infrastructures)**

- uses-type: VI) shows and public meetings; VII) hotels, restaurants; IX) sports and leisure
- **1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup> or 4<sup>th</sup> risk categories + people with physical or psychologic limitations**

Safety records / prevention procedures / **prevention plan** / emergency procedures / **emergency plan** / awareness and training activities / drills

WUITIPS Workshop 1 – May 11th 2023

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### CASE STUDY: FIRE OF PÓVOA MEADAS – ANDANÇAS FESTIVAL (AUGUST, 2016)



- 03 of August, 2016 (~14h45)
- 3500 participants (~20% foreigners)
- 446 vehicles totally destroyed (507 vehicles affected)
- No fatalities

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### CASE STUDY: FIRE OF PÓVOA MEADAS – ANDANÇAS FESTIVAL (AUGUST, 2016)



1st alert from the public

Campsite Póvoa Meadas

Ignition point

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### CASE STUDY: FIRE OF PÓVOA MEADAS – ANDANÇAS FESTIVAL (AUGUST, 2016)



Caravan Park


Campsite Póvoa Meadas

Ignition point

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**CASE STUDY: FIRE OF PÓVOA MEADAS – ANDANÇAS FESTIVAL (AUGUST, 2016)**




Only the creation of fuel breaks supported by very large firefighting means stopped the fire spread

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**CASE STUDY: FIRE OF PÓVOA MEADAS – ANDANÇAS FESTIVAL (AUGUST, 2016)**


- Fuel management improperly carried out
- This is a typical situation of car parks close to the beaches and other natural touristic areas



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**CASE STUDY: FIRE OF PÓVOA MEADAS – ANDANÇAS FESTIVAL (AUGUST, 2016)**



- Citizens and tourists are often compelled to help, but they may put themselves in risky situations.
- The creation of panic or individual strategies could jeopardize operations.
- Volunteers and short-term staff may not be prepared to manage large emergencies, which is also true for many other tourist infrastructures workers.

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## CASE STUDY: FIRE OF PÓVOA MEADAS – ANDANÇAS FESTIVAL (AUGUST, 2016)



- In the aftermath, some tourists leave the event areas, but foreigners who have lost goods tend to stay.
- How can we accommodate thousands of people if necessary?
- Massive communication systems (participants, relatives, friends, etc.) is essential.

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## CASE STUDY: FIRE OF PÓVOA MEADAS – ANDANÇAS FESTIVAL (AUGUST, 2016)

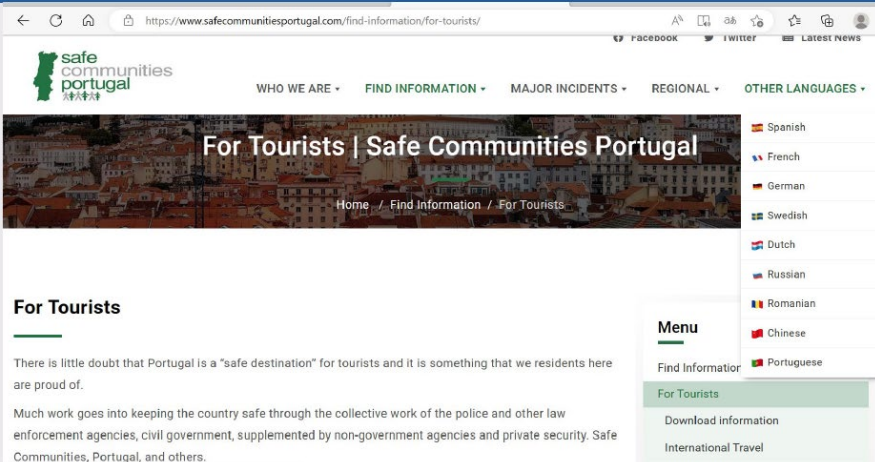


**COULD BE WORST!**

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## CONCLUDING – SAFE COMMUNITIES PORTUGAL



For Tourists | Safe Communities Portugal

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**For Tourists**

There is little doubt that Portugal is a "safe destination" for tourists and it is something that we residents here are proud of.

Much work goes into keeping the country safe through the collective work of the police and other law enforcement agencies, civil government, supplemented by non-government agencies and private security. Safe Communities, Portugal, and others.

Menu

- Find Information
- For Tourists
- Download information
- International Travel

Other Languages: Spanish, French, German, Swedish, Dutch, Russian, Romanian, Chinese, Portuguese

WUITIPS Workshop 1 – May 11th 2023

### 3.6. Survey on the state-of-the art of WUI fire management in Tuscany region, by Giacomo Sbaragli

#### 3.6.1. Abstract

Tuscany is a wildfire-prone area of Italy that has seen a rise in forest cover alongside an increasing number of forest fires during these last years. Tuscany is a highly popular tourist destination, attracting over 8 million visitors annually, with approximately 5.5 million being locals and the remainder consisting of foreign tourists. Several notable wildfire case studies provide valuable baselines for the WUITIPS project. For instance, the Marina di Grosseto fire in 2017 resulted in numerous damaged homes and the destruction of dozens of vehicles. Similarly, the fires in Calci (2018) and Massarosa (2022) led to the evacuation of several hundred people and caused damage to multiple homes. Another significant event was the fire in Campiglia Marittima in 2020, where a tourist village sustained severe damage. Analysing these incidents has provided valuable insights, revealing specific needs and gaps in wildfire prevention. The lessons learned from these fires have highlighted the necessity for increased awareness among the population and local entities. Furthermore, there is a need for improved design guidelines for forest fire prevention in tourist-heavy areas. Strengthening cooperation between neighbouring entities and developing a fire weather forecast bulletin accessible to the general population are also crucial steps. It is important to emphasize some positive practices observed in Tuscany, such as the development and implementation of comprehensive civil protection plans at the municipal level. Additionally, efforts to establish Firewise Communities have been undertaken to enhance fire resilience, particularly in areas where the wildland-urban interface is prominent.

#### 3.6.2. Presentation printout

The image shows a presentation slide for WUITIPS Workshop 1. At the top left, it says 'Co-funded by the European Union' with the EU flag. To the right, it says 'Project: 101101169 — WUITIPS — UCPM-2022-PP'. The main title is 'Region: Tuscany (Italy)' and the presenter is 'Giacomo Sbaragli (D.R.E.Am. Italia)'. The slide features the WUITIPS logo (a map pin with a flame) and the D.R.E.A.M. ITALIA logo. A blue banner across the middle reads 'WUITIPS – Workshop 1'. Below this, there are logos for 'UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH Centre for Technological Risk Studies', 'Diputació de Girona', 'Efectis', 'VALABRE ANZICHER VOTRE PRESENT', and 'LUND UNIVERSITY'. At the bottom, a blue banner contains the text 'Towards a harmonized framework for cross-border fire management in touristic infrastructures'. The footer at the very bottom reads 'WUITIPS Workshop 1 – May 11th 2023'.

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## PRESENTATION OF THE EXPERTS

- Contributors:
  - Giacomo Sbaragli (forest fire fighters trainer, D.R.E.Am. Italia)
  - Luca Tonarelli (technical director of the forest fires training centre, D.R.E.Am. Italia)
- Tuscany / Italy (borders and WUI touristic areas)



Tuscany:

- 22.985 km<sup>2</sup>
- 3.649.447 inhabitants



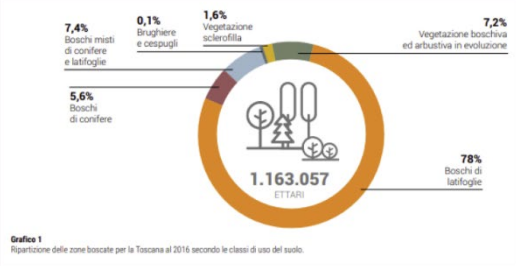
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## WHAT AND WHERE: FOREST COVER


- Hectares of forest cover in Tuscany:
  - 1998: 1.086.000 ha
  - 2021: approx. 1.200.000 ha

Approx. 10 ha/day of new forest...



**1.163.057** ETTARI

Category	Percentage
Boschi di latifoglie	78%
Boschi di conifere	5,6%
Spicchi misti di conifere e latifoglie	7,4%
Vegetazione boschiva ed arbustiva in evoluzione	7,2%
Vegetazione sclerofilla	1,6%
Brughiere e cespugli	0,1%

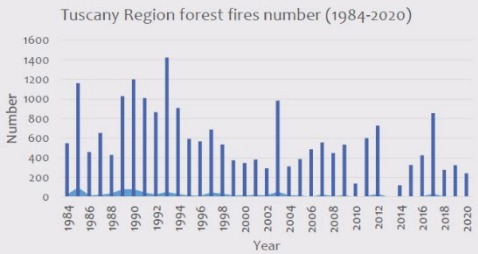


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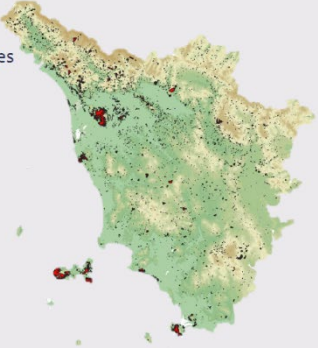
## WHAT AND WHERE: FOREST FIRES

- Medium per year statistics in Tuscany Region (2002-2021):
  - Yearly forest fires surface: 1429 (both forest fires + vegetation fires)
  - Growing number of forest fires with evacuations and structures damages



Tuscany Region forest fires number (1984-2020)

Year	Numero incendi >20HA	Numero incendi boschivi
1984	1100	100
1986	500	100
1988	600	100
1990	1000	100
1992	1400	100
1994	800	100
1996	600	100
1998	500	100
2000	400	100
2002	1000	100
2004	500	100
2006	500	100
2008	500	100
2010	500	100
2012	700	100
2014	200	100
2016	400	100
2018	800	100
2020	300	100



1984-2020 Tuscany forest fires

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## WHAT AND WHERE: TOURISTIC PRESENCE

**Grafico 9- Turisticità per comune. Toscana. Anno 2022<sup>1)</sup>**

Fonte: elaborazioni Settore "Servizi Digitali e Integrazione Dati. Ufficio Regionale di Statistica" su dati provvisori Istat

**Grafico 1- Serie storica delle presenze per provenienza e tipologia ricettiva. Toscana. Anni 2005-2022 (valori assoluti)**

Legend: STRANIERI\_estrallieghieri, ITALIANI, STRANIERI

Fonte: Ufficio Regionale di Statistica su dati provvisori Istat (da ci funzionalità)

**Total visitors 2021: 8.384.537 (5.547.946 domestic tourists and 2.836.591 foreign tourists).**  
**Total visitors 2020: 5.565.080 (4.044.434 domestic tourists and 1.520.646 foreign tourists).**  
 Source: ISTAT

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## FIRES IN TOURISTIC INFRASTRUCTURES

**Incendio Marina di Grosseto  
16 Luglio 2017**

FFMC	DMC	DC	FWI
80,4	118	949	47,5

Verbo dominante: GRECALE (NE)

- Marina di Grosseto (2017)
- Some damaged homes and dozens destroyed vehicles

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## FIRES IN TOURISTIC INFRASTRUCTURES

- Calci (2018)
- 750 evacuated people
- 4 destroyed and 6 damaged homes

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## FIRES IN TOURISTIC INFRASTRUCTURES





- Campiglia Marittima (2020)
- Damaged tourist village

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## FIRES IN TOURISTIC INFRASTRUCTURES



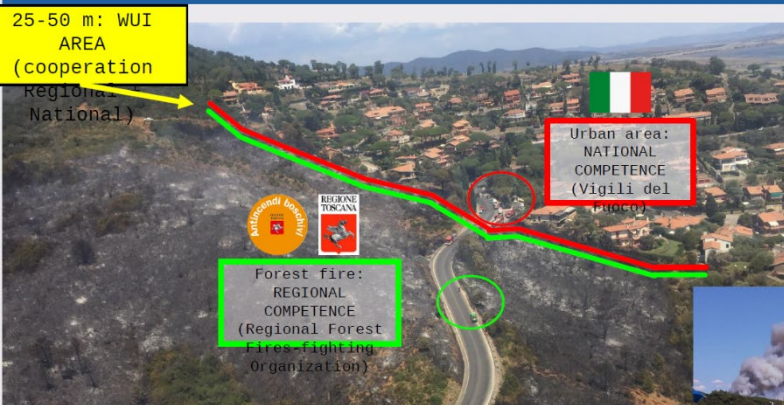


- Massarosa (2022)
- 500 evacuated people
- 5 destroyed and 6 damaged homes

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## WUI WILDFIRES: EMERGENCY COOPERATION




25-50 m: WUI AREA (cooperation Regional/National)

Forest fire: REGIONAL COMPETENCE (Regional Forest Fires-fighting Organization)

Urban area: NATIONAL COMPETENCE (Vigili del Fuoco)

- Castiglione della Pescaia (2017)



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## WUI WILDFIRES: EMERGENCY COOPERATION

**4° Reggimento Aviazione Esercito "ALTAIR"**  
34° Gruppo Squadroni Aviazione Esercito "TORO"

REGIONE TOSCANA

■ Marina di Grosseto (2012)

Forest fire:  
REGIONAL  
COMPETENCE  
(Regional Forest  
Fires-Fighting  
Organization)

Camping:  
NATIONAL  
COMPETENCE  
(Vigili del  
Fuoco)

25-50 m: WUI  
AREA  
(cooperation  
Regional +  
National)

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## GOVERNANCE

<p><b>National level</b></p>	<ul style="list-style-type: none"> <li>• Directive of the Presidency of the Council of the Ministers (yearly general information to Regional Administrations)</li> </ul>
<p><b>Regional level</b></p>	<ul style="list-style-type: none"> <li>• Forest Fires Regional Operational Plan (updated every 3 years: indications, economic sources, authorization, types of works, etc.)</li> </ul>
<p><b>Landscape level</b></p>	<ul style="list-style-type: none"> <li>• "Specific forest fires prevention plan" (10 years program of forestry works on strategical management points)</li> </ul>
<p><b>Municipal level</b></p>	<ul style="list-style-type: none"> <li>• Mayor's order</li> <li>• "Municipal Civil Protection Plan"</li> </ul>

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## NEEDS & GAPS

At National as at Regional level:

- To increase population awareness
- To increase prevention works
- To better design specific guidelines/references for forest fires prevention in touristic areas for regulating touristic infrastructures protection
- To spread risk awareness among local Entities
- To make (or to create) efficient cooperation between bordering entities

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## GOOD PRACTICES

At Regional level:

- Landscape scale: "Specific forest fires prevention plan" (10 years program of forestry works on strategical management points).

**IMPORTANT:** no administrative or property boundaries, but boundaries designed by previous risk assessment.

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## GOOD PRACTICES

> Campogallo Parco reale (FPI\_001 / FPI\_002)  
Intervento previsto per il 2020



CLASSIFICAZIONE INTERVENIENTI:

- Lunghezza minima: 25 metri
- Piano arboreo: eliminazione totale dello strato arbustivo dove presente
- Piano arboreo:




<b>BEFORE</b>	<b>AFTER</b>
	
<b>BEFORE</b>	<b>AFTER</b>
	

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## GOOD PRACTICES

At Regional level:

- Municipal/property scale:
- Firewise Communities






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## GOOD PRACTICES

At Regional level:

- Municipal/property scale:
  - **"Municipal Civil Protection Plan"** (Interface risk map, Waiting area assessment, Escape route assessment, Indications for self-protection, Standards of behaviour for the population)




■ European Projects and direct information to tourists



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## FIRES IN TOURISTIC INFRASTRUCTURES

Area	Shortcoming / need / gap
Governance	National level: general indications. Regional level: "Specific forest fires prevention plans", which provide effective prevention works and fuel treatment. Municipal level: Mayor's order (not effective) and/or "Municipal Civil Protection Plan" (risk assessment).
Risk management planning	"Forest Fires Regional Operational Plan" (every 3 years). National planning guideline: "Operational manual for the preparation of a Municipal Civil Protection plan" (2007). Borders cooperation between emergency services. Ministerial Order 28th February, 2014 (for prevention only for tourist accommodation facilities with capacity of > 400 people).
Risk assessment	Only one official reference, but only for risk assessment at Municipal level: National planning guidelines "Operational manual for the preparation of a Municipal Civil Protection Plan" (2007).
Risk prevention and preparedness	As for general population as for tourists: lack of a culture of self-protection and how to act in a fire event. Working on it with Firewise Communities and specific information to tourists (local and foreigners) from Regional Entity and local entities (European projects). Fire weather forecast bulletin adapted for population.
Emergency response	Coordination between forest fire-fighters (Regional Organization) and urban fire-fighters (Vigili del fuoco), needs to improve it. When fire is going to affect WUI, evacuation is adopted. Confinement isn't used yet, it's starting to being considered in Firewise Communities. "Municipal Civil Protection plans" can provide indications.
Risk recovery	Not available accurate data repository where collecting WUI damages and fatalities. Lessons learned where fires affected WUI where are starting (or have already started) Firewise Communities.

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### 3.7. Survey on the state-of-the art of WUI fire management in Croatia, by Klaudijo Filcic

#### 3.7.1. Abstract

The coastal regions of Croatia, known for their tourist appeal with over 1,300 tourist establishments, have historically been susceptible to wildfires. Similar to many other Mediterranean countries, the interaction between wind and topography plays a significant role in driving these fires. Fire services often face challenges in forecasting fire behaviour due to the unpredictable changes in wind direction. A notable case study in Croatia that holds relevance for the WUITIPS project is the Crikvenica fire, which occurred in July 2012 and resulted in the burning of 520 hectares. The fire posed immense difficulties for firefighters due to strong winds exceeding 100 km/h, rendering water-bombing unavailable. Around 1,500 tourists from two campsites had to be evacuated, and some other tourists chose to leave a nearby hotel. Road traffic was suspended for 24 hours. Thankfully, there were no fatalities, only a few individuals sustaining minor injuries. This wildfire emergency offered valuable insights and lessons to enhance Croatia's overall fire risk management cycle. Regarding governance, it was evident that upgrading the vegetation clearing guidelines from voluntary to binding measures was necessary. Furthermore, there was a need for standardized methods for wildfire risk assessment, along with the implementation of public awareness programs, comprehensive firefighters' training, and improved decision support systems for emergency response.

#### 3.7.2. Presentation printout

The presentation printout includes the following elements:

- Top Bar:** Co-funded by the European Union (left), Project: 101101169 — WUITIPS — UCPM-2022-PP (center), and a small logo (right).
- Left Side:** WUITIPS logo (a blue location pin with a flame) and the text "WUITIPS".
- Center:** "Country: Croatia" in blue, followed by the Croatian flag, and "Klaudijo Filčić (VZPGŽ) v.3" in blue.
- Right Side:** The Croatian flag.
- Blue Bar:** "WUITIPS – Workshop 1" in white text.
- Logos Row:** Logos for CR-TEC, UNIVERSITAT POLITÈCNICA DE CATALUNYA (UPC) Centre for Technological Risk Studies, Diputació de Girona, Efectis, VALABRE (ANTICIPER VOTRE PRESENT), and LUND UNIVERSITY.
- Bottom Bar:** "Towards and harmonized framework for cross-border fire management in touristic infrastructures" in white text.
- Footnote:** "WUITIPS Workshop 1 – May 11th 2023" in small text at the bottom left.

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## PRESENTATION OF THE EXPERTS

- Local coordinator: **Klaudijo Filčić** (Fire Officer, Rijeka, Primorje&Gorski kotar County Firefighting Association - VZPGZ)
- Contributor:
  - Nikola Tramontana** (County Fire Commander Assistant, VZPGZ)
  - Dario Gauš** (Deputy Commander, Rijeka City Fire Brigade – JVP RI)
- Croatia
  - Population: 3.87 mil.
  - Area (land): 56,594 km<sup>2</sup>
  - Admin. division:
    - 21 Counties (NUTS-3 level)
    - 127 Cities + 428 Municipalities (LAU-2)

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## WILDFIRES PER REGIONS IN 2022 (NUTS-2 LEVEL, NON-AMNISTRATIVE)

- Litoral region / 7 counties –(blue)**
  - “traditionally” – more affected by wildfires
  - More Tourist-oriented
- Continental region / 14 counties (green and orange)**
  - More rural areas

2022	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
<b>Litoral</b>	317	330	1.481	230	200	257	534	488	178	150	72	10	<b>4.247</b>
<b>Continental</b>	30	198	1.930	175	142	137	462	446	80	24	14	6	<b>3.644</b>
<b>Total</b>	347	528	3.411	405	342	394	996	934	258	174	86	16	<b>7.891</b>
<b>Share</b>	4,4%	6,7%	43,2%	5,1%	4,3%	5,0%	12,6%	11,8%	3,3%	2,2%	1,1%	0,2%	<b>100%</b>

source: Croatian Firefighting Association

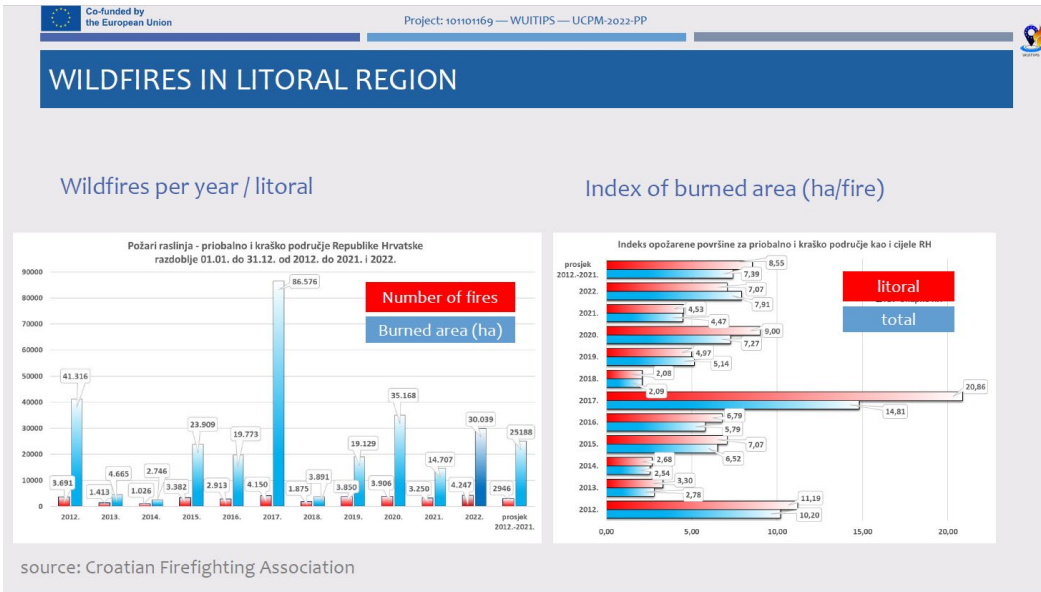
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## MOST SEVERE WILDFIRES

- 23.-24. July 2012, Crikvenica, 500 ha
- 17.-19. July 2017, Split, 4.500 ha
- 13.-15. July 2022., Vodice, 3.300 ha

Share of burned area - Growth of thru the year 2022

Month	Share (%)
Jan	4,4%
Feb	6,7%
Mar	43,2%
Apr	5,1%
May	4,3%
Jun	5,0%
Jul	12,6%
Aug	11,8%
Sep	3,3%
Oct	2,2%
Nov	1,1%
Dec	0,2%



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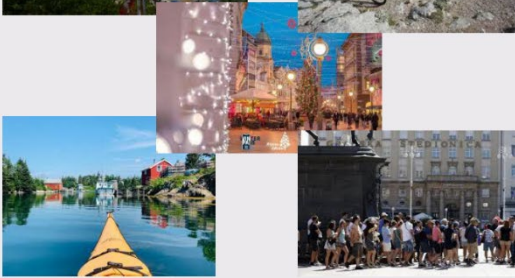
## FIRE REGIME IN CROATIA

- Type of fires
  - ✓ wind interaction with topography and fuel availability
  - ✓ constant change of wind direction / difficulties in fire direction prediction
  - ✓ The final phase still dangerous, and require FF presence after “extinguished” phase

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## TOURIST INFRASTRUCTURE

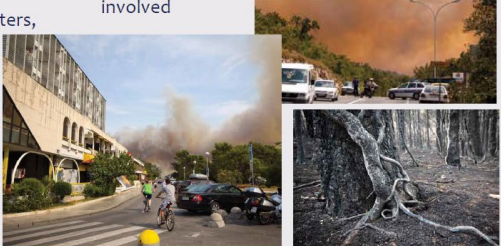
Type of accommodation	Number of establishments	Number of beds
Hotels	713	118.620
Tourist resorts	63	27.322
Tourist apartments		10.650
Camps	334	261.867
Private rooms		704.926
Spa	8	1.559
Resorts	14	1.694
Hostels	227	14.814
Others	11	935
Uncategorized	11	935
Total	1.381	1.143.322

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### CASE STUDY: CRIKVENICA (23.-24.JULY 2012)

- What happened:
  - ✓ 230835 fire start / human cause
  - ✓ Very strong Northerly wind with constant change of direction (traffic accidents – overturn camper on viaduct)
  - ✓ 230850 declared 2° of operative plan – full local mobilization
  - ✓ 230915 declared 3° of operative plan – county mobilization +
  - ✓ 231015 camp#1 - evacuation of tourists - ended
  - ✓ 231045 camp#2 - evacuation of tourists - ordered
  - ✓ 231600 national resources start comming (incl. firefighters, army, foresters, civil protection)
  - ✓ 240800 aerial means arrived
  - ✓ 241000 wildfire declared “under control”
  - ✓ 241400 wilfire declared “extinguished”
  - ✓ 24.-26. July – control activities / 12hrs shifts / 150 firefighters
- Main consequences:
  - ✓ Full evacuation of a 2 camping sites (preventive evacuation, smoke)
  - ✓ Road Traffic at the only communication were cut off for approx 24 hrs
  - ✓ 520 ha burned area
  - ✓ 1 (one) roof affected
  - ✓ No hard injured persons / 600 firefighters involved



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Wildfire approaching the urban center of crikvenica (23/7/2012)

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### SUMMARY

Area	Shortcoming / need / gap
Governance	Proposal to upgrade <b>Vegetation Fire Protection Guideline</b> – from voluntary to obligatory regulation
Risk management planning	In preventive measures of forest FP measures consider to add water points / reservoirs
Risk assessment	Create specific guidelines / methodology for wildfire risk assesment
Risk prevention and preparedness	Additional public awareness programs on wildfire risks and self-protection and upgrade the knowledge and training of firefighters about vegetation, terrain and weather – related to fire propagation.
Emergency response	Extreme weather conditions – wind and smoke closed main roads and blocks aerial means, multiple fires and traffic accidents, adequate basic maps and IT decision support solutions

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### 3.8. Survey on the state-of-the art of WUI fire management in Bulgaria, by Todor Stoyanov

#### 3.8.1. Abstract

Bulgaria has up to now mainly experienced small wildfires, with only 9 fires larger than 500 ha between 2013 and 2022. Most wildfires happened in the region of Kardzhali, close to the border with Greece (this region also accounts for the largest burnt area in the same time period), and in the region of the capital, Sofia.

A notable case study in Bulgaria that is relevant for the WUITIPS project is the fire that broke out in July 2012 in the "Bistrisko branishte" reserve, where one of the main hiking trails of Vitosha Mountain is located. It took approximately 2 weeks to extinguish the fire, which burned 10% of the reserve's territory, and a touristic infrastructure was almost impacted by the fire. The fire spread through dead fuels that were not removed after the passing of a tornado in 2001, highlighting the poor fuel management of the natural park.

Currently, in Bulgaria, WUI fire prevention is not included in the legislation and the population is not aware of the risks entailed to wildfires.

#### 3.8.2. Presentation printout

The image shows a presentation slide for WUITIPS Workshop 1. At the top left, it states 'Co-funded by the European Union' with the EU flag. To the right, it says 'Project: 101101169 — WUITIPS — UCPM-2022-PP'. The main title is 'Region: Bulgaria' in blue, followed by the presenter's name 'Dipl. Eng. Todor Stoyanov, PhD'. On the left, there is a logo for WUITIPS featuring a blue location pin with a flame and the text 'WUITIPS'. Below the title, a blue banner reads 'WUITIPS – Workshop 1'. The bottom section contains logos for 'CIRTEC UPFC' (Centre for Technological Risk Studies), 'Diputació de Girona', 'Efectis', 'VALABRE' (with the tagline 'ANTICIPER VOSTRE PRESENT'), and 'LUND UNIVERSITY'. A blue footer banner contains the text 'Towards and harmonized framework for cross-border fire management in touristic infrastructures'. At the very bottom, it says 'WUITIPS Workshop 1 – May 11th 2023'.

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## PRESENTATION OF THE EXPERTS

- Local coordinator: Dipl. Eng. Todor Stoyanov, PhD - Chief assistant in the scientific structural unit "Forest Ecology" of the Forest Research Institute at the Bulgarian Academy of Sciences, Lecturer at the University of Forestry, Sofia (Engineer in Geo-Ecology, specialist in forest ecology, fire ecology, MBA, DBA, Forest cooperatives).
- Contributors:
  - Prof. Dr. Nickola Stoyanov, Forest Consult BG EOOD, Lecturer at the University of Forestry, Sofia (Organization and planning in forestry; Marketing; Management.)

■ Bulgaria



110 993.6 km<sup>2</sup>  
6 520 314 inhabitants

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## FIRE REGIME - GENERAL FIRE STATISTICS IN BULGARIA 2013-2022

<b>BULGARIA - National Forestry Board</b>		<b>01.01.2013 - 31.12.2022</b>
<b>Number of fires</b>	<b>&lt;1ha</b>	<b>2067</b>
	<b>&gt;=1ha</b>	<b>2200</b>
	<b>&gt;100ha</b>	<b>74</b>
	<b>&gt;500ha</b>	<b>9</b>
	<b>TOTAL</b>	<b>4350</b>
<b>Burnt areas (Ha)</b>	<b>wooded</b>	<b>36158.3</b>
	<b>non wooded</b>	<b>6887.6</b>
	<b>TOTAL</b>	<b>43045.9</b>

Source: <https://system.iag.bg>

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## FIRE REGIME - GENERAL FIRE STATISTICS IN BULGARIA 2013-2022

<b>CAUSES OF FOREST FIRES FOR THE ENTIRE COUNTRY DURING THE PERIOD -&gt;</b>		
<b>01.01.2013 - 31.12.2022</b>		
Reason	number	%
Lightning	140	3.22%
Military shooting	24	0.55%
Explosive works	2	0.046%
Transport-technological (sparks)	80	1.84%
Short circuit	120	2.76%
A cigarette	275	6.32%
A dump	63	1.45%
Stubble burning	649	14.92%
Burning pastures	550	12.64%
Arson	209	4.80%
Tourists	146	3.36%
Hunters	7	0.16%
Outdoor workers	60	1.38%
Pyromaniac/psychopath	3	0.069%
Children	31	0.71%
Another known reason	1141	26.23%
Unknown	850	19.54%
<b>Everything</b>	<b>4350</b>	<b>100.00%</b>

Source: <https://system.iag.bg>

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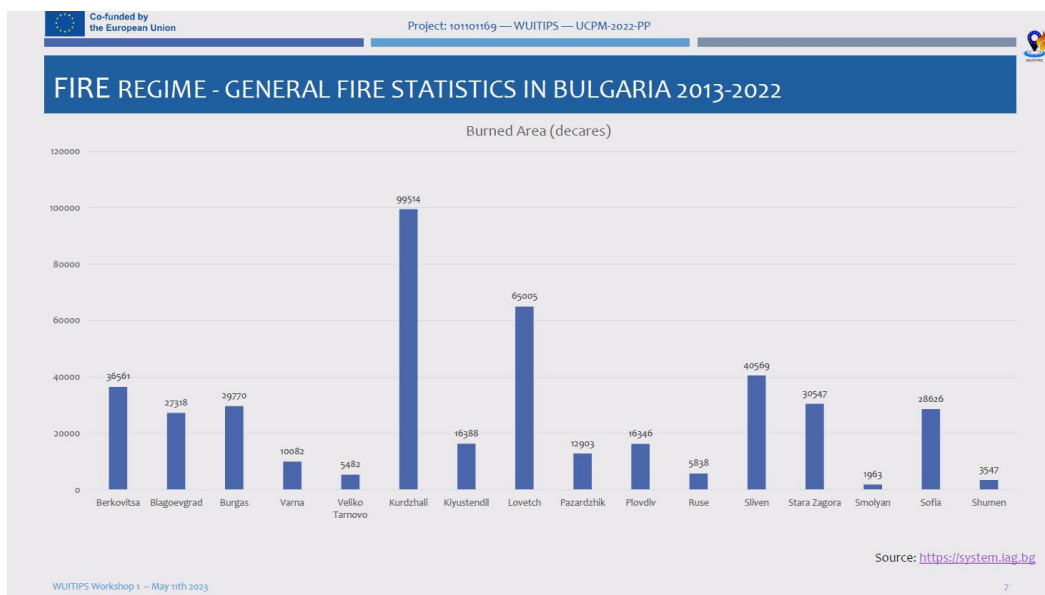
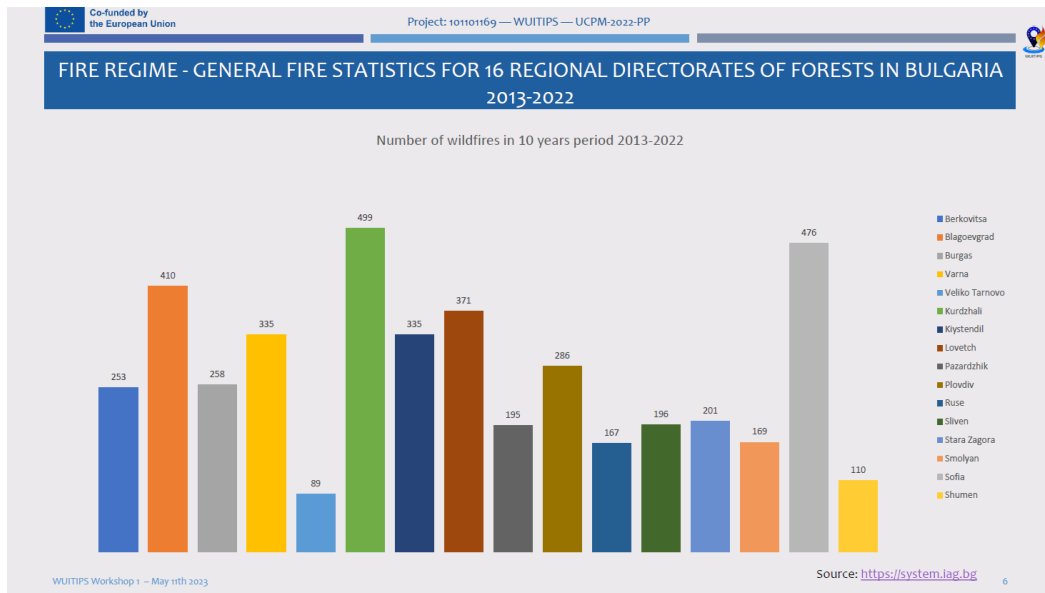
### FIRE REGIME - GENERAL FIRE STATISTICS IN BULGARIA 2013-2022

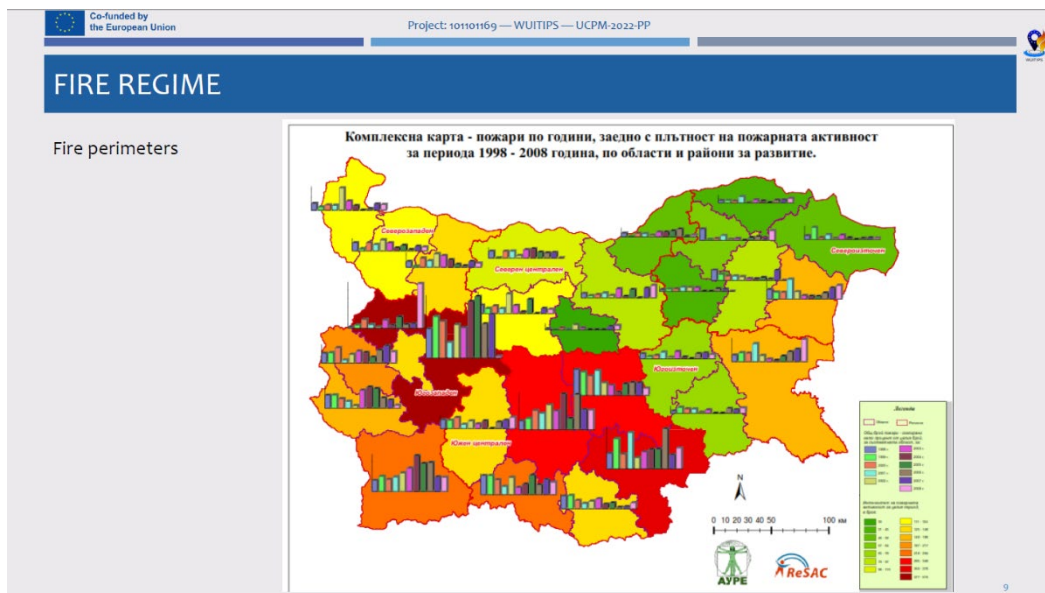
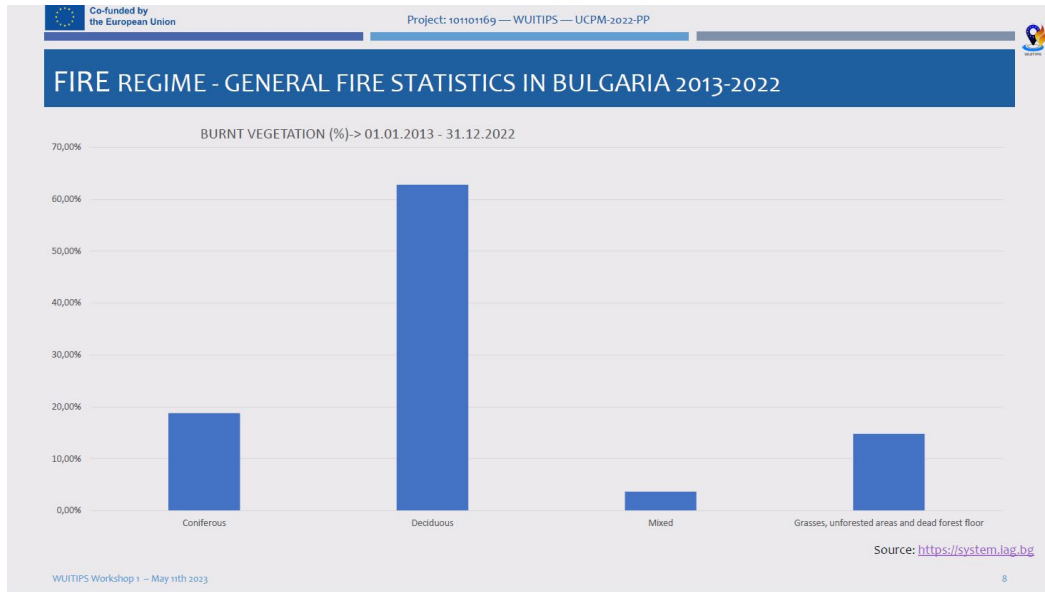
**PARTICIPANTS IN THE EXTINGUISHING OF FOREST FIRES FOR THE ENTIRE COUNTRY DURING THE PERIOD -> 01.01.2013 - 31.12.2022**

PARTICIPANTS IN THE EXTINGUISHING	number
Employees of State Forestry Enterprises	36974
Employees of Fire and Emergency Safety	26278
Military personnel	3403
Volunteers	15756
Cars of State Forestry Enterprises	11867
Fire and Emergency Safety Vehicles	8446
Heavy machinery	383
Airplanes	1
Helicopters	65
Mobile means of communication	26626

Source: <https://system.lag.bg>

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### TOURISTIC INFRASTRUCTURES

#### ACTIVITY OF ACCOMMODATION PLACES BY STATISTICAL ZONES, STATISTICAL REGIONS AND REGIONS IN 2022

Area	Accommodation places - number	Number of beds	Realized accommodations - number		Overnight persons - number	
			Total	including, foreigners	Total	including, foreigners
North and Southeast Bulgaria	2 464	265 826	16 684 879	10 403 953	4 286 106	2 085 039
Southwest and South central Bulgaria	1 567	88 929	7 488 412	2 483 002	3 335 128	984 824
<b>Total for the country</b>	<b>4 031</b>	<b>354 755</b>	<b>24 173 291</b>	<b>12 886 955</b>	<b>7 621 234</b>	<b>3 069 863</b>

WUITIPS Workshop 1 – May 11th 2023 Source: NSI <https://www.nsi.bg/bg/content/1978/1Do1EBy1Do1EEDo1E841Do1E81D:1881Do1E8D1Do1E88-1Do1E841Do1E8o1E8D1Do1E8D1Do1E88> 10

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### CASE STUDY: 1 BISTRISHKO BRANISHTE RESERVE (JULY 2012)

- What happened:
  - Shortly after 2:00 p.m. on July 1, 2012, a fire broke out in the wind patch in the "Bistrishko branishte" reserve. It covered an area of about 5 hectares. The trees felled by the tornado that passed on May 22nd 2001 caught fire.
  - The territory is difficult to access and fire suppression can only be done from the air. The helicopters that joined the fight against the fire are filling their tanks with water from Lake Pancharevo. Teams of volunteers, forestry officials and firefighters are helping to extinguish the fire. Extinguishing and high-passage equipment, cutters and additional shovels for manual extinguishing are provided for them. Only people with special equipment, who are given dust masks, are allowed in the area of the disaster.
  - The fire in the Bistrishko branishte biosphere reserve is in the area of the Fizkulturnik hut.
  - Due to a bad management policy of Vitoshka Nature Park, after the blizzard in 2001, the fallen wood (fuel material) was not removed.
  - The cause of ignition is unknown - either negligence or natural.
- The balance sheet:
  - Burned 60 ha or 10% of the territory of Bistrishko Branishte Biosphere Reserve.
  - Extinguishing the fire - about two weeks
  - Extinguishing - from the air and on the ground, with manpower, due to the inaccessibility of the terrain
  - One of the first mass participation of volunteers in extinguishing forest fires (due to the proximity of Vitoshka Mountain to the Capital)
- Main touristic consequences:
  - One of the main hiking trails of the Vitoshka Mountain, at about 2000 m above sea level.
  - The Fizkulturnik hut was near the fire (A three-story building with a capacity of 150 seats and is the training base of the Vasil Levski National Sports Academy).



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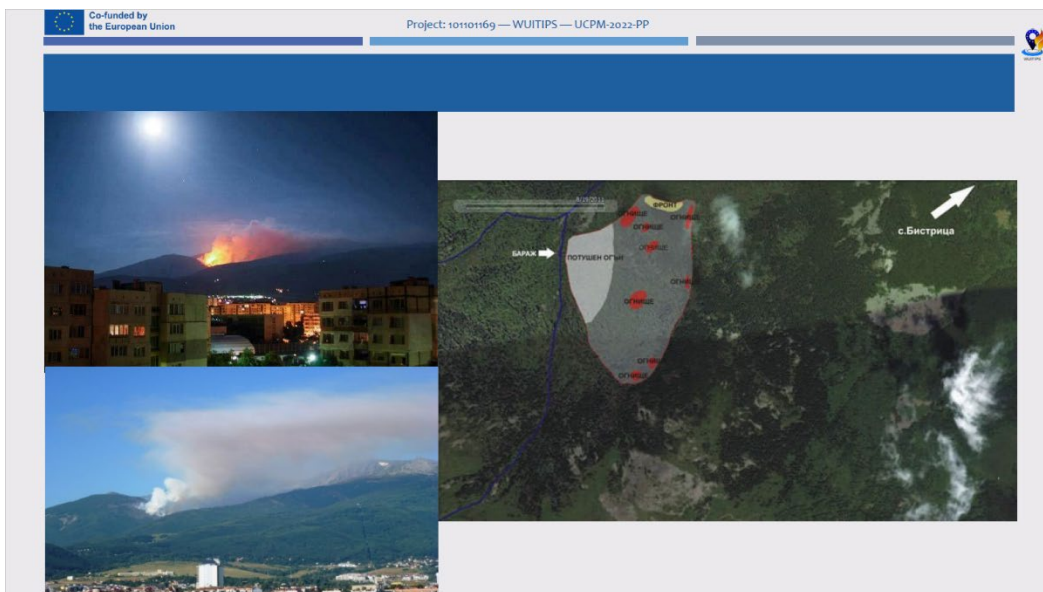
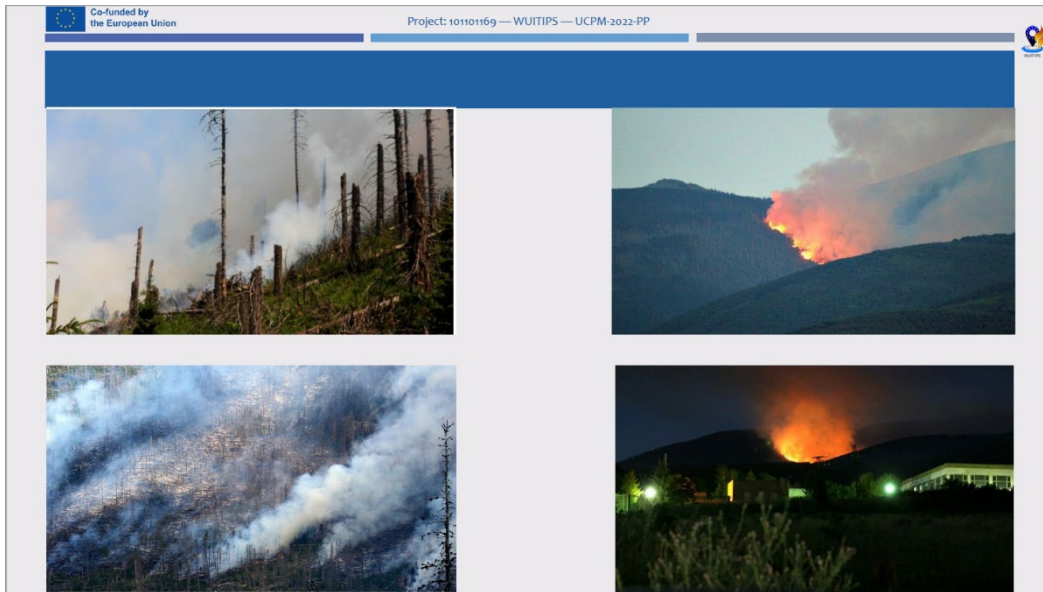
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### THE "FIZKULTURNIK" HUT

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FIRES IN TOURISTIC INFRASTRUCTURES	
Area	Shortcoming / need / gap
Governance	A proposal to extend the Forestry Act to include WUI fire prevention for all vulnerable elements of the territory. Update of the Ordinance on Fire Protection of Buildings. Updating the established methodology for assessing the risk of wildfires. Coordination between the individual responsible institutions.
Risk management planning	It is necessary to take preventive measures to avoid blocking the borders. Strategic management points, water points and road systems need to be integrated into the recovery plans of all relevant units. Actualization of Risk assessment methodology needed.
Risk assessment	Integration between firefighting units should be reviewed in high-intensity fires and in areas with a high risk of splashing into WUI areas. Role and responsibility definitions should be made again for these situations. Integrating a risk register.
Risk prevention and preparedness	Need to carry out evacuation drills. Evidence of a lack of a culture of self-protection and how to act in a fire event. Training on first aid, self-protection, confinement or safe evacuation. Knowledge about vegetation species and structures that facilitate the passage of fire to the house. Necessity of protection tasks for vulnerable elements in order to free resources from suppression.
Emergency response	Often the residential area or WUI is not prepared for a fire and does not know how to act. Conducting information campaigns among the local population (especially among the young) would help to develop their self-awareness. "The forewarned is prepared!"
Risk recovery	Emergency Management. The most important thing is prevention and a quick, timely response. Therefore, it is necessary to update the methodology for assessing the risk of wildfires, to assess the territory multifactorially, to prepare maps of the risky territories and to direct prevention efforts there. Real-time monitoring of risk areas.

### 3.9. Survey on the state-of the art of WUI fire management in Greece, by Miltiadis Athanasiou

#### 3.9.1. Abstract

Greece has historically been affected by both wind/topography driven and plume dominated wildfires. As the number of tourists per year approaches 30 million, and many of the touristic areas are located in WUI areas, the situation in Greece is relevant for the WUITIPS project.

Although the total annual burned area has slightly decreased over the last 20 years (with the exceptions of the years 2017 and 2021), notable case studies that include fatalities have occurred in these last two decades. A lightning-caused fire in northern Greece in August 2006, which spread through an extensive WUI with significant tourist presence, caused one fatality (a tourist), and many people, including tourists, had to be evacuated by boat. Another remarkable case study is the fire that erupted in July 2018 in North-eastern Attica that killed 102 people, among which four tourists. These incidents highlight the necessity for the development of Fire Prevention Plans in municipalities and regions, along with the need to inform the population on preventive measures as well as on evacuation strategies. As these fires are exceeding the capacity of the firefighting agencies, right decisions by the citizens on whether to evacuate or not will help to avoid accidents and save firefighting resources. Additionally, risk assessment tools regarding the WUI are needed, given that many touristic locations are within WUI areas.

#### 3.9.2. Presentation printout

The image shows a presentation slide for WUITIPS Workshop 1. At the top left, it states 'Co-funded by the European Union' with the EU flag logo. To the right, it says 'Project: 101101169 — WUITIPS — UCPM-2022-PP'. The main title is 'Region: Greece' and the presenter is 'Dr. Miltiadis Athanasiou'. The WUITIPS logo, which includes a map of Greece and a flame, is on the left. Below the title, a blue banner reads 'WUITIPS – Workshop 1'. The bottom section features logos for 'UNIVERSITAT POLITÈCNICA DE CATALUNYA BARCELONATECH Centre for Technological Risk Studies', 'Diputació de Girona', 'Efectis', 'VALABRE ANTICIPAR I PREVENIR', and 'LUND UNIVERSITY'. A blue banner at the bottom contains the text 'Towards and harmonized framework for cross-border fire management in touristic infrastructures'. The footer at the very bottom reads 'WUITIPS Workshop 1 – May 11th 2023'.

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## PRESENTATION OF THE EXPERTS Greece

- Local coordinator: Miltiadis Athanasiou (Wildfire Management Consulting and Training)
- Contributors:
  - Gavriil Xanthopoulos (Research Director, Institute of Mediterranean Forest Ecosystems, Hellenic Agricultural Organization "Dimitra")
  - Elias Tziritis (Forest Fires Actions Coordinator, WWF Greece)

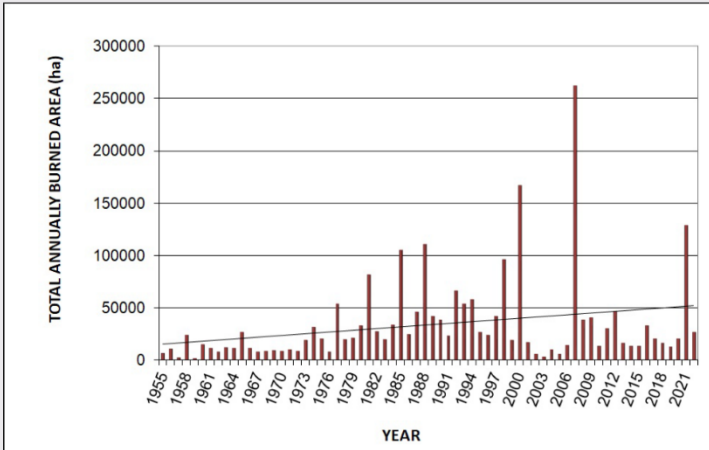


131,957 km<sup>2</sup>  
10,482,487 inhabitants (2021)  
Source: Hellenic Statistical Authority

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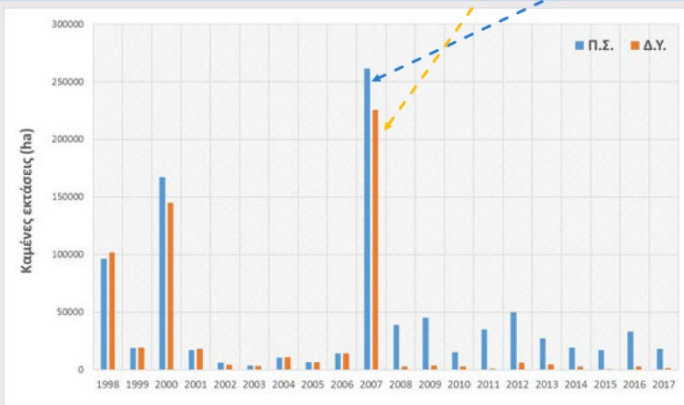
## FIRE REGIME General fire statistics in Greece / Burned area per year



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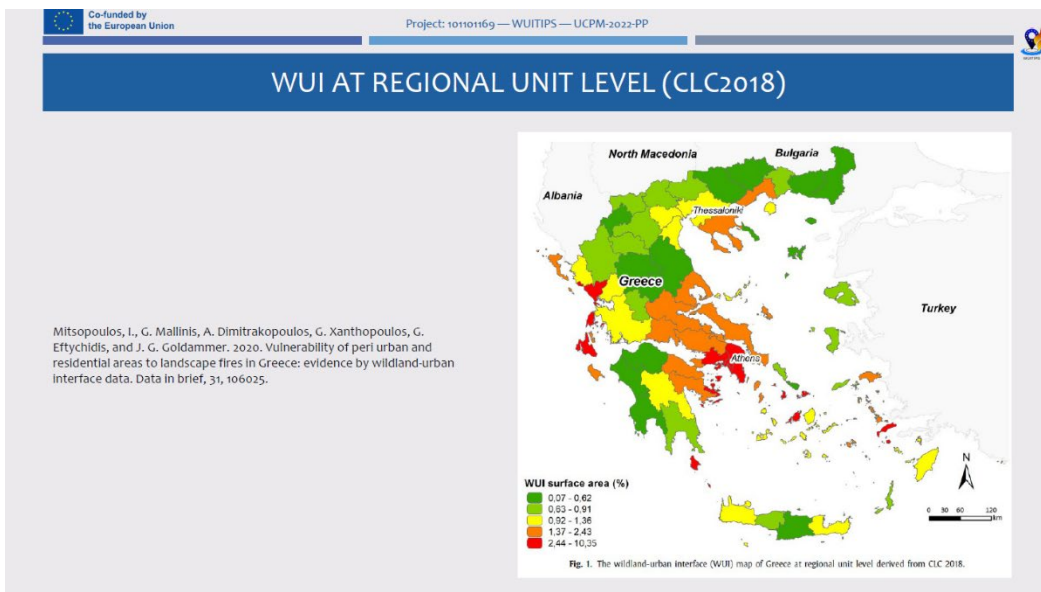
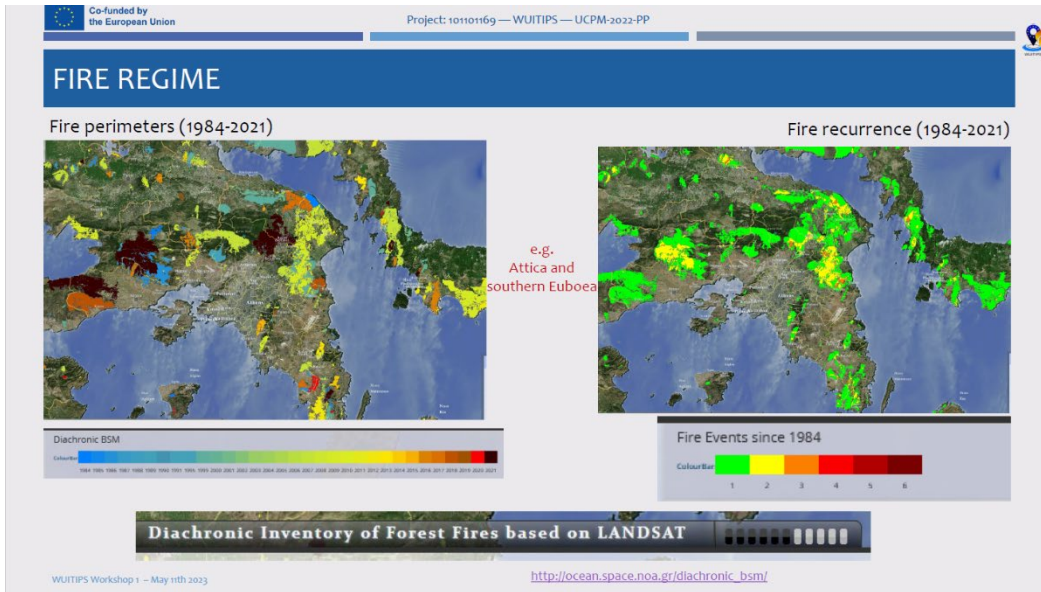
## General fire statistics in Greece: Burned area per year (Forest Service vs Fire Service data)



Goldammer, J., G. Xanthopoulos, G. Efthychidis, G. Mallinis, I. Mitsopoulos, and A. Dimitrakopoulos. 2019. Report of the Independent Committee tasked to Analyze the Underlying Causes and Explore the Perspectives for the Future Management of Landscape Fires in Greece. The Global Fire Monitoring Center (GFMC). 155 p. (in Greek, executive summary in English).

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## FIRE REGIME

- Types of fires
  - Wind/topography driven fires
    - ✓ Wind interaction with topography and fuel loads.
    - ✓ The head of the fire aligns with the wind's maximum speed vector
    - ✓ Fire head usually exceeds suppression capacity
    - ✓ Spotting takes place in relatively dry conditions
  - Plume dominated fires
    - ✓ Low wind speed conditions or areas protected from the wind
    - ✓ High fuel loads potentially available to burn
    - ✓ Atmospheric instability (blue sky)

Source: P. K.

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## FIRES IN TOURISTIC INFRASTRUCTURES

Touristic infrastructure	Number of establishments	Number of seats
Hotels & resorts	10,087	885,624
Campsites	299	23,767
Flats		
Tourist housing (including agroturism)		-
Motor home areas	out-of-date data	-

Source: Hellenic Chamber of Hotels 2022

Total visitors **2022: 27,700,000** (6,250,000 domestic tourists and 21,450,000 foreign tourists)  
 Total visitors **2019: 29,900,000** (8,400,000 domestic tourists and 21,500,000 foreign tourists)  
 Source: ELSTAT

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## PAST WILDFIRES (SOME OF THEM AFFECTING TOURISTS)

**August 21, 2006,**

A large lightning-caused fire in northern Greece (Kassandra peninsula) —

It spread through an extensive WUI interface with significant tourist presence.

Many people, among them many tourists, were evacuated by boats as the main road had been blocked by the wildfire.

A German tourist tried to get in a boat, fell in the sea and drowned.

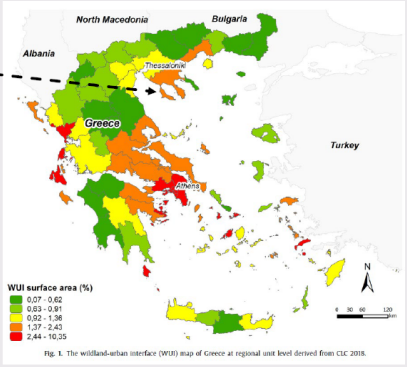


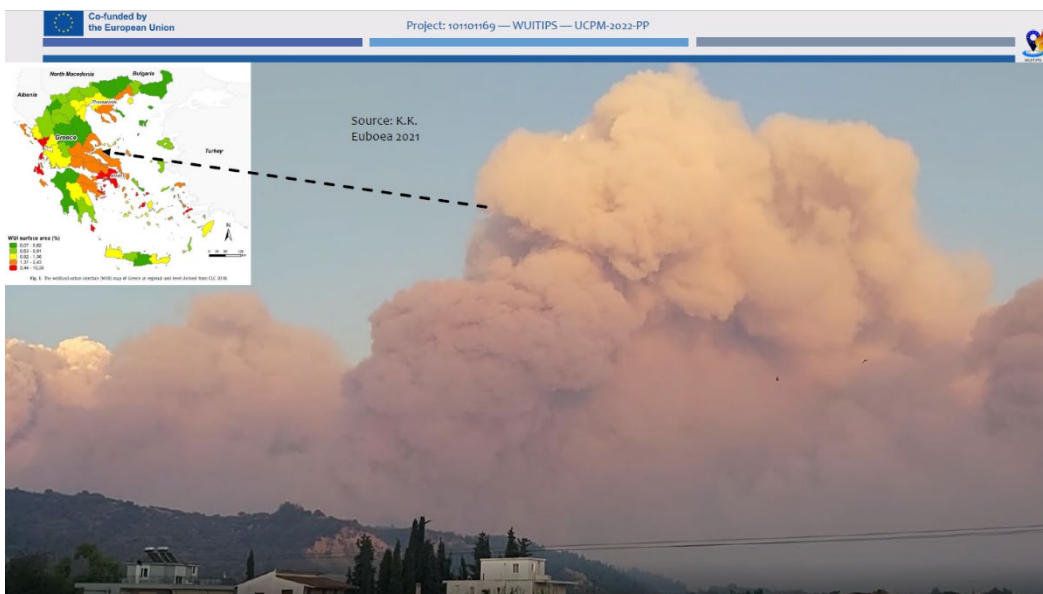
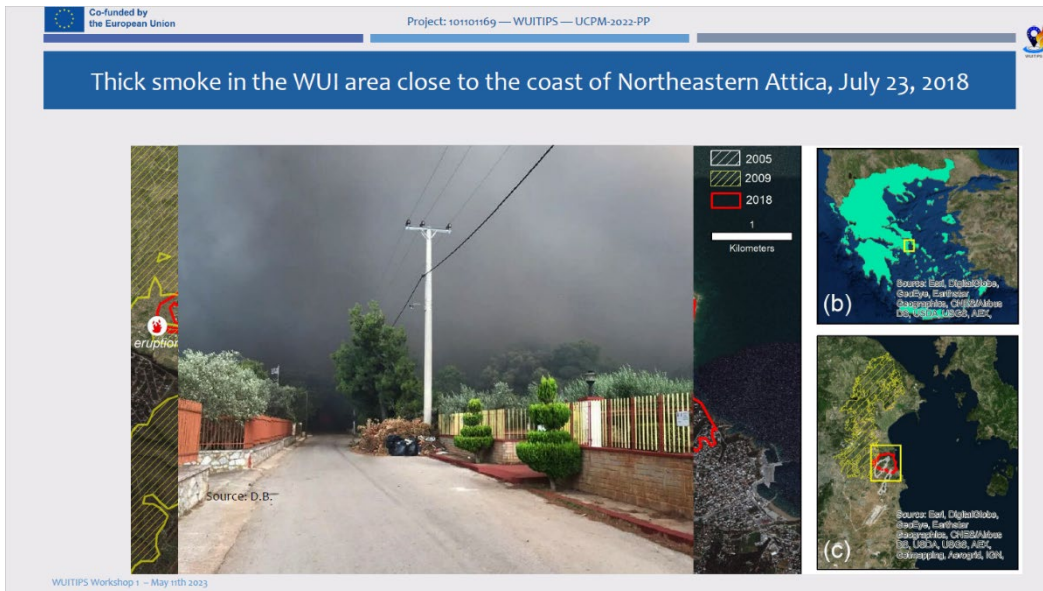
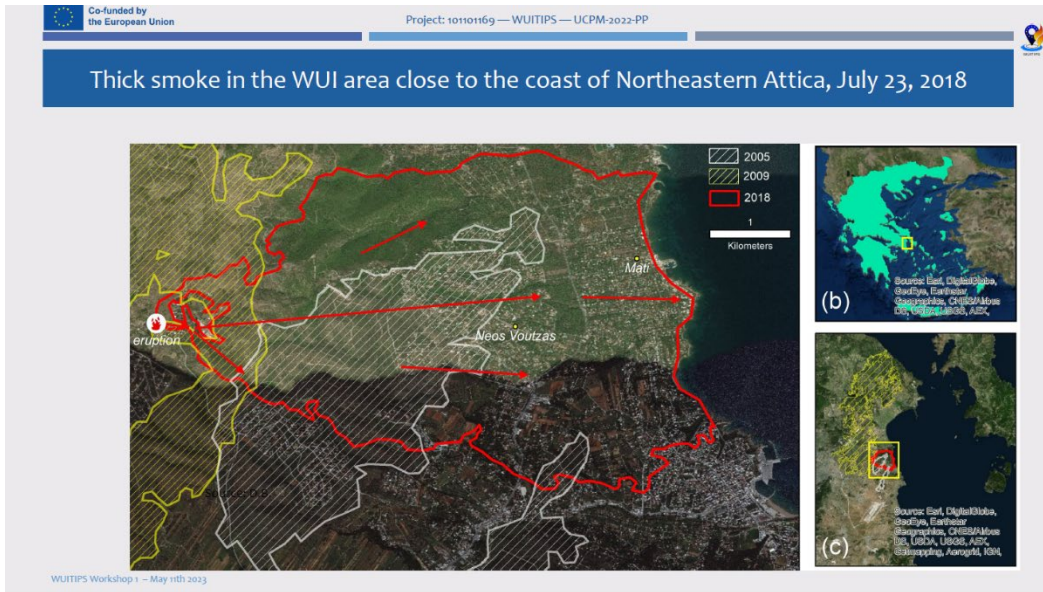
Fig. 1. The wildland-urban interface (WUI) map of Greece at regional unit level derived from CIG 2015.

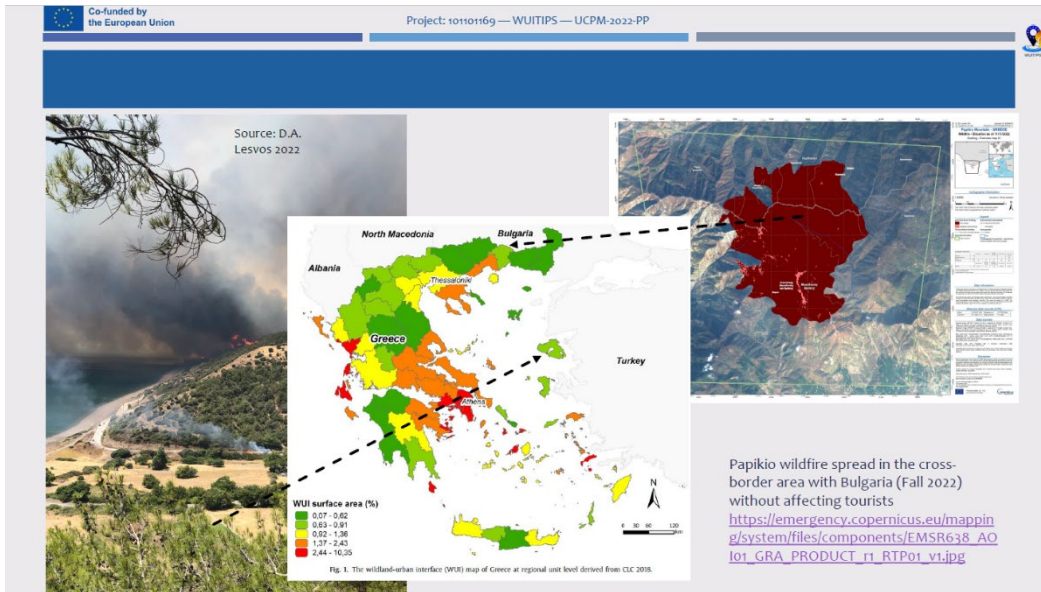
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Four of them were tourists.  
 An Irishman, two Polish (a woman and her 9-year-old son) who drowned and a Belgian man who drowned also.  
 The deadliest wildfire in Greece so far, and the second one worldwide for the 21st century, erupted on July 23, 2018, in the Northeastern Attica, and Greece killed 102 people.

Attica 2018





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### FIRES IN TOURISTIC INFRASTRUCTURES

Area	Shortcoming / need / gap
Governance	Development of guidelines for Fire Prevention Plans in municipalities and regions, is necessary.
Risk management planning	Need to educate, to inform, to help citizens get prepared, to take preventive measures, to avoid panic. It is vital to spot areas that may serve as evacuation triggers for the residents of WUI, by considering how a fire spreads, and how a community evacuates. Addressing uncertainties is vital.
Risk assessment	Threat analysis is needed regarding WUI and RUI areas.
Risk prevention and preparedness	Need to carry out evacuation drills guided by the results of the threat analysis. Need to help citizens enhance self-protection culture and decision-making skills. In many cases, the evacuation option may be the exception rather than the rule.
Emergency response	Fires that spread in parallel, exceed the capacity of the firefighting agencies. Right decisions by the citizens on whether to evacuate or not will help avoid accidents and save firefighting resources.
Risk recovery	Lessons learned approach, synthesis and improvements in prevention and suppression.

WUITIPS Workshop 1 – May 11th 2023 15

### 3.10. Survey on the state-of the art of WUI fire management in Turkey, by Turgay Dindaroglu

#### 3.10.1. Abstract

Turkey is a highly touristic country, yearly visited by approximately 50 million people. In the country, the number of wildfires has stayed approximately stable during the years 2016-2021, although the burned forest area is slightly increasing. In 2021 Turkey experienced a significant peak in burned area due to the Milas wildfire, which is relevant to the WUITIPS project, given that it took place in a touristic area. The fire broke out in a coastal forested area covered with pine trees, located close to several hotels, which were reached by flames. Approximately 4200 people were evacuated by sea, as 2 hotels were disconnected from the highway. Twenty-two municipalities were affected by the fire, and the evacuation of the area took approximately 3.5 hours.

The event highlighted the lack of a culture of self-protection and how to act in a fire event, as most of the firefighting's efforts had to be devoted to evacuating people and protecting sensitive locations. Additionally, the event emphasised the need for better integration and communication between firefighting units, along with the necessity of reviewing roles and responsibilities for these events.

#### 3.10.2. Presentation printout

The image shows a presentation slide for WUITIPS Workshop 1. At the top, it is co-funded by the European Union (Project: 101101169 — WUITIPS — UCPM-2022-PP). The slide features the WUITIPS logo, which consists of a blue location pin with a flame rising from it. The text on the slide includes "Region: Turkiye" and "Prof. Dr. Turgay Dindaroglu". A blue banner across the middle reads "WUITIPS – Workshop 1". Below this, there are logos for the following organizations: CERTEC and UPC (Centre for Technological Risk Studies), Diputació de Girona, Efectis, VALABRE (ANTICIPER VOTRE PRESENT), and LUND UNIVERSITY. At the bottom, a blue banner contains the text "Towards and harmonized framework for cross-border fire management in touristic infrastructures". The footer of the slide reads "WUITIPS Workshop 1 – May 11th 2023".

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## PRESENTATION OF THE EXPERTS

- Local coordinator: Turgay Dindaroglu (Forest engineer specialist in forest ecology, fire ecology, soil ecology)
- Contributors:
  - Emin Demir, Fire Management Center



783,562 km<sup>2</sup>  
84,000,000 inhabitants

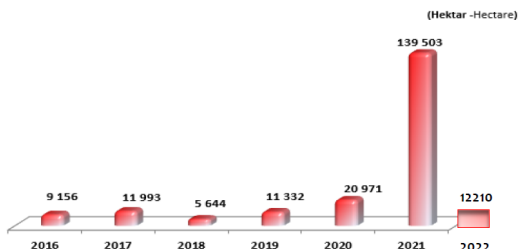
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## FIRE REGIME

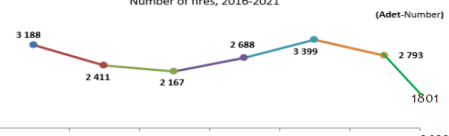
- General fire statistics in Turkiye

**Yanan Orman Alanları, 2016-2021**  
Burning forest areas, 2016-2021



Year	Burning forest areas (Hektar)
2016	9 156
2017	11 993
2018	5 644
2019	11 332
2020	20 971
2021	139 503
2022	12 210

**Yangın Sayıları, 2016-2021**  
Number of fires, 2016-2021




Year	Number of fires
2016	3 188
2017	2 411
2018	2 167
2019	2 688
2020	3 399
2021	2 793
2022	1 801

Source: Forest Fire Prevention Management Section, Government of Turkiye, [www.ogm.gov.tr](http://www.ogm.gov.tr)

WUITIPS Workshop 1 – May 11th 2023 3

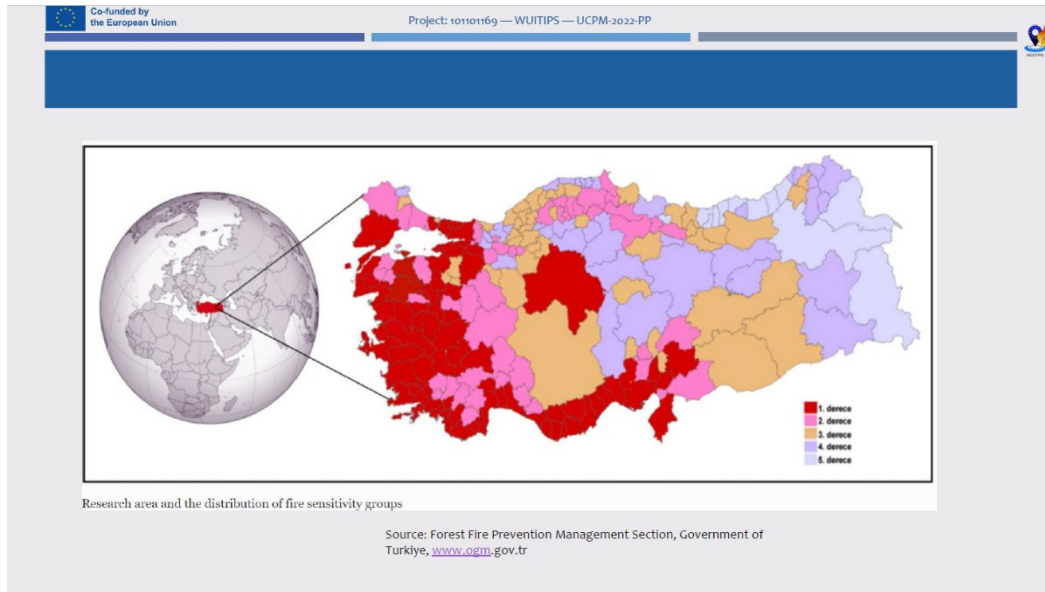
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## FIRE REGIME



**Fig. 1:** Map showing the phylogeographical regions of Turkey

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From: *Factors Affecting the Behavior of Large Forest Fires in Turkey*

Characteristic No.	Explanation	Minimum	Maximum	Mean	Std. deviation
1	Degree of sensitivity to fire	1	3	1.15	0.4
2	Distance to forest enterprise (km)	8	150	30	18.80
3	Aspect	Northwest	Southeast	West, Southwest	-
4	Altitude (m)	100	1600	395.76	289.36
5	Land relief	Flat	Crest	Ramp	-
6	Temperature (°C)	26.0	43.0	33.95	3.42
7	Precipitation (mm)	0.9	76.5	12.37	14.43
8	Relative humidity (%)	12	64	28.54	11.85
9	Wind speed (km/h)	10	65	38.02	11.06
10	Wind direction	South	North	Northwest	-
11	Fire month	October	August	July	-
12	Fire hour	10-24	10-17	-	-
13	Stand tree species	Cp + Bp	M	Cp	-
14	Development stage of stand	Regenerated	Overmature	-	-
15	Stand age	10	30	25.25	4.09
16	Stand canopy	1	3	2	-
17	Burned area amount (ha)	400	13,260	1,931	2,351
18	Rate of spread (ROS) (m/min)	18	53	31	6.89
19	Extinguishing time (h)	53.50	960.50	276	160.03
20	Fire reason	Lightning	Negligence	-	-

Cp Calabrian pine, Bp black pine, M Maquis

Dağdemir, I., Aydın, F. & Ertuğrul, M. Factors Affecting the Behavior of Large Forest Fires in Turkey. *Environmental Management* 67, 162–175 (2021). <https://doi.org/10.1007/s00267-020-01389-z>

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## FIRES IN TOURISTIC INFRASTRUCTURES

Touristic infrastructure	Number of establishments Certified	Number of seats
Hotels & resorts	5386	1.205.240
Campsites	290	46.274
Tourist housing (including agroturizm)	102	71.535
Motor home areas	out-of-date data	-

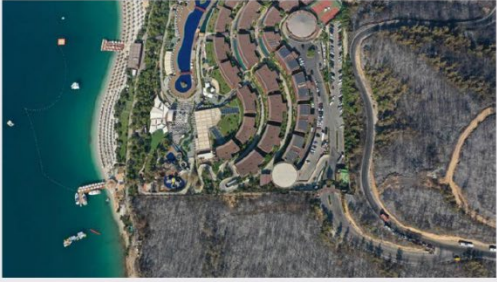
Total visitors 2022: 51,310.002 (foreign tourists).  
 Total visitors 2019: 45,058.286 (foreign tourists).

Source: TUIK

WUITIPS Workshop 1 – May 11th 2023 7

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## FIRES IN TOURISTIC INFRASTRUCTURES




**Wildfire approaching the touristic hotel of Mugla, Turkiye (25/08/2021)**

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## CASE STUDY: 1 MILAS WILDFIRE (AUGUST 2021)

- What happened:
- Upon the notification of those who saw the flames rising in the forest area in the Meşelik District of Milas district, many sprinklers and fire extinguishing helicopters were sent to the region.
- A fire broke out at around 14:30 in the forest area covered with pine trees in Meşelik Mahallesi, Kuyucak locality.
- The fire, which broke out in an area close to the hotels area, spread to a wide area in a short time. The flames endured to the gardens of 2-5 star hotels in the region.
- The flames were intervened with 8 water sprinklers and 6 fire trucks and 40 forest workers. Work continues to pave the way in the forested area with construction equipment.
- Gendarmerie teams removed the tourists on the beach from the area as a precaution. Some boat owners supported the evacuation of tourists staying in hotels in the region where access by land is difficult.
- The flames grew with the effect of the wind and spread to the Güvercinlik District of Bodrum.
- During the evacuation procedures, medical teams were kept ready on land. The evacuation, coordinated by the Coast Guard Command and Search and Rescue teams, took approximately 3,5 hours.

- Main touristic consequences:
  - ✓ Approximately 2,200 customers and 2 thousand personnel who were trapped in the hotels were evacuated with the work of the Coast Guard Command and tour and fishing boats.
  - ✓ 22 municipalities were affected by the fire
  - ✓ 2 hotels on the coast were disconnected from the highway due to the flames.


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It was reported that in the forest fire in Muğla's Marmaris district, the flames approached up to 100 meters from the settlements.

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The fire in Bodrum started at around 14:30 in the forest area in Kuyucak near Güvercinlik village. The fire, which grew rapidly with the effect of the wind, directed towards the region where the touristic hotels are located. The Titanic and Lujo hotels, threatened by the flames, were evacuated. Guests at the Lujo Hotel were evacuated by boats.

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Milas district of Muğla, the forest fire spread to the region where the hotels are located in the Güvercinlik district. 26 August 2021

FIRES IN TOURISTIC INFRASTRUCTURES	
Area	Shortcoming / need / gap
Governance	Proposal to extend the Fire Prevention Law in WUI to all vulnerable elements of the territory. Regulation on fire protection of buildings: 12937/2007
Risk management planning	It is necessary to take preventive measures to avoid blocking the borders. Strategic management points, water points and road systems need to be integrated into the recovery plans of all relevant units.
Risk assessment	Integration between firefighting units should be reviewed in high-intensity fires and in areas with a high risk of splashing into WUI areas. Role and responsibility definitions should be made again for these situations.
Risk prevention and preparedness	Need to carry out evacuation drills. Evidence of a lack of a culture of self-protection and how to act in a fire event. Training on first aid, self-protection, confinement or safe evacuation. Knowledge about vegetation species and structures that facilitate the passage of fire to the house. Necessity of protection tasks for vulnerable elements in order to free resources from suppression.
Emergency response	Often the residential area or WUI is not ready for fire and does not know how to act. Emergency hotlines are usually called. What has to be done in the past is very important. Unconsciousness and fear make decision making very difficult and limit firefighters' defense resources. In this case, the extinguishing capacity may be compromised. The first hours of the fire were devoted to evacuating people, confining and protecting sensitive items.
Risk recovery	Complaints about emergency management. Increased blame and responsibility. Many improvements are needed in both prevention and suppression. Although wildfires are huge, there is usually time to evacuate. If wildfires are very flammable and large, staying in place and defending may not work. If it's a low-intensity fire, it can stay in place and be defended.

WUITIPS Workshop 1 – May 11th 2023

14

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- 105 staff (workers, pilot, engineers) died in a forest fires last two decades in Türkiye.
- Martyrdom of Forest Fire, Antalya




Orman yangınlarında kaybettiğimiz  
AZIZ ŞEHİTLERİMİZİ  
rahmet ve şükranla anıyoruz.

## 4. Workshop wrap-up

Tourism in wildland-urban interface (WUI) areas is particularly vulnerable, as tourists are generally unaware of fire risk, and tourism-oriented buildings and facilities lack systematic preparation for forest fire impacts. This is especially evident in trans-boundary touristic regions where population flows from one country to another. In such regions, proper and effective collaboration between the responders involved is required but rarely present. Addressing these challenges necessitates raising awareness among tourists, implementing adequate fire prevention and preparedness measures in tourism-related structures, and promoting collaboration among responders in cross-border touristic regions.

WUITIPS project is aimed at contributing to minimize wildfire risk in touristic areas and touristic infrastructure, with a main focus on the Spanish-French border between Girona Province and Département des Pyrénées Orientales, spanning over the touristic areas in the mountains and the coastal touristic development.

However, the aim of the WUITIPS consortium is that the methods and guidelines developed through the project will be directly applicable to other identified transboundary regions in Europe, (e.g. Huelva-Algarve (Spain-Portugal), Alpes Maritimes-Imperia (France-Italy), Adriatic Croatia (Croatia-Slovenia), Piera and Chalkidiki (Greece-Macedonia/Bulgaria)). To this end, a living lab of knowledge transfer has already been created with a wide ecosystem of stakeholders and end-users across EU (i.e. touristic sector, municipalities and first responders including UCPM representatives) to interact and provide feedback through dedicated meetings and workshops.

The first international workshop of the WUITIPS project has played a crucial role in addressing wildfire safety issues in touristic areas, featuring the active participation of representatives from our living lab spanning 8 different countries. During the workshop, a comprehensive analysis of past fire events relevant for WUITIPS and the latest advancements in governance, risk management planning, risk assessment, risk prevention and preparedness, emergency response, and lessons learned were presented and compared. One notable observation was the varying levels of implementation of an overarching risk reduction framework among the participating countries. This divergence primarily stems from the severity and impact of past fire events experienced in each respective region. Additionally, it was evident that there was a lack of specific attention given to wildfires and their impact on tourism in any of the cases examined.

The discussions that took place during the dedicated round tables will now undergo thorough analysis, synthesis, and consolidation to identify gaps and harmonization needs across EU countries throughout the entire risk management cycle. These findings will serve as a foundational reference for WUITIPS in defining the scope and contents of the EU harmonized guideline for fire prevention and protection planning in touristic infrastructure, taking into account the diverse wildfire risk management approaches across the EU. A comprehensive summary of these findings will be compiled and documented in the upcoming WUITIPS deliverable 2.1, scheduled for release by June 2023. Additionally, there are plans to prepare a scientific paper that provides a detailed analysis, discussions, and conclusive insights to be published in a peer-reviewed journal in the relevant field. The tentative target is the first quarter of 2024 for the publication of the paper.

## ANNEX 1 - Questionnaire

### 1. Governance

*[Institutional framework and legislation]*

1.1. Are there any regulations or policies in your country/region regarding wildfire risk reduction at the wildland-urban interface (e.g. risk assessment, risk management planning, risk prevention and preparedness, emergency response, risk recovery)? Are there building regulations/codes or guidelines including provisions to deal with fires at the WUI?

1.2. If so, what is the structure of this legal framework? What are the topics/measures covered? Upon who rests the duty/obligation of these measures to be accomplished?

1.3. What is the degree of accomplishment/implementation of the mentioned measures? What could be done to improve the situation?

### 2. Risk management planning

*[Prioritization, policy coherence]*

2.1. Are there protocols or guidelines available for drafting risk management plans (i.e. prevention, preparedness, emergency response) either at local, regional or national level?

2.2. Are there any wildfire-prone borders in your country (if so, please specify)? How do you work in case of cross-border fires? Is there in your region any type of protocol or agreement that establishes the framework of cooperation with neighbouring countries?

2.3. How do touristic infrastructures manage wildfire risk in your region? Do you have specific examples of good practices in terms of risk management?

### 3. Risk assessment

*[hazard identification, risk analysis, risk evaluation]*

3.1. Do you have or use methods, models, or approaches for the assessment of hazard and vulnerability in wildfire scenarios that involve inhabited areas, especially touristic infrastructures?

### 4. Risk prevention and preparedness

*[Landscape planning, awareness, risk communication, training, early warning systems]*

4.1. Do you think that the general population in your region is aware of the fire risk at the wildland-urban interface?

4.2. Do you think tourists have the same perception of risk as locals? What could be done to improve it?

4.3. What practices are usually carried out in relation to fire risk treatment at the WUI, specifically in cross-border touristic areas at the different scales (landscape scale, community scale and property scale)?

4.4. Are there in your region awareness campaigns specifically tailored for tourists?

## **5. Emergency response**

*[Rescue, containment and suppression operations, response coordination]*

5.1. In the event of a wildfire affecting the WUI, what type of wildfire management or fires suppression operations do your fire agencies most frequently apply? Fire attack? Defensive operations (e.g. confinement, protection of vulnerable elements, etc.)? other strategies?

5.2. In the event of a wildfire affecting the WUI, how do you reduce risk to population? What type of protocols do you have? Evacuation? Shelter-in-place? Stay-and-defence? Do you apply different protocols for vulnerable population (as tourists)?

## **6. Risk recovery and lessons learnt**

*[Past fires: scenarios, data gathering]*

6.1. Are you aware of past wildfires involving touristic infrastructure in your region? What type of actions were undertaken considering tourists? (Evacuation, shelter-in-place, stay-and-defend)? If so, please indicate the details and if official/unofficial information sources are available.

6.2. Is there any disaster loss data catalogue/repository for wildfires at national or subnational level?