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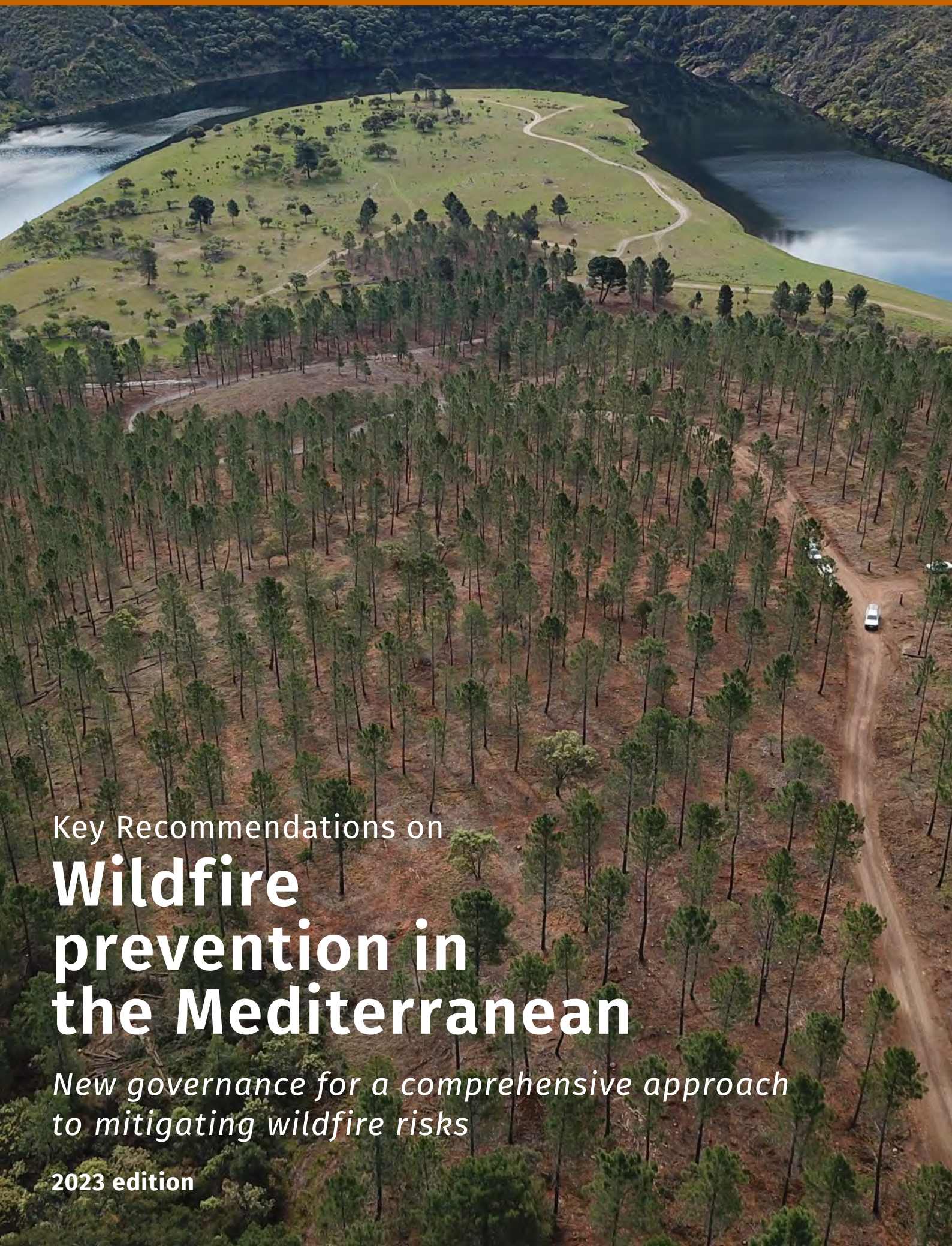

Key Recommendations on

# Wildfire prevention in the Mediterranean

*New governance for a comprehensive approach to mitigating wildfire risks*

**2023 edition**

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# Foreword

In recent years great progress has been made in integrated fire management in the Mediterranean region, with significant contributions from research, development of new technologies, professionalisation of firefighting resources, population awareness and conciliation of interests. However, to effectively manage the complex reality of wildfires, with new scenarios ahead, much more effective prevention and preparedness measures are required.

Stakeholders must collaborate in creating resistant and resilient landscapes to reduce the negative impacts of wildfires and increase the ability of quick recovery. All actors with a role and responsibility on wildfire management across different sectoral policies need to be involved. Governance models are key elements in applying both top-down and bottom-up approaches. These will ensure that any stakeholder or actor associated with any role, responsibility, or impact are considered.

This great challenge needs better-informed, and more-responsible and -involved decision makers, including the general public, to work together to improve wildfire prevention and risk reduction.

This document is an update of the 2011 edition of the ***Position Paper on Wildfire Prevention in the Mediterranean***. It exemplifies the opportunity to re-address wildfire prevention based on current and future scenarios and challenges. It synthesises the work and reflections of a wide range of Mediterranean experts committed to conserving, managing, and protecting our natural environment.

There are many wildfire management initiatives being considered or implemented at subnational, national and regional levels in the Mediterranean. A more concerted approach will harness synergies, harmonise scientific and technical guidance and provide consensual recommendations. Some of these have been recently developed in response to more urgent challenges for preventing wildfires. This document synthesises the main discussions, accommodates the interests raised in different fora, and highlights what further measures are still required.

The following ***Key Recommendations on Wildfire Prevention in the Mediterranean*** focus on six topics: 1) Planning (programmes, policies, and adaptation strategies); 2) Governance models as a cornerstone; 3) Developing sustainable financial mechanisms to ensure implementation and continuation of wildfire management measures; 4) Knowledge generation, education, and awareness of society; 5) Harmonising information systems as the basis for sharing information and understanding the complex reality of wildfires; and 6) International cooperation.

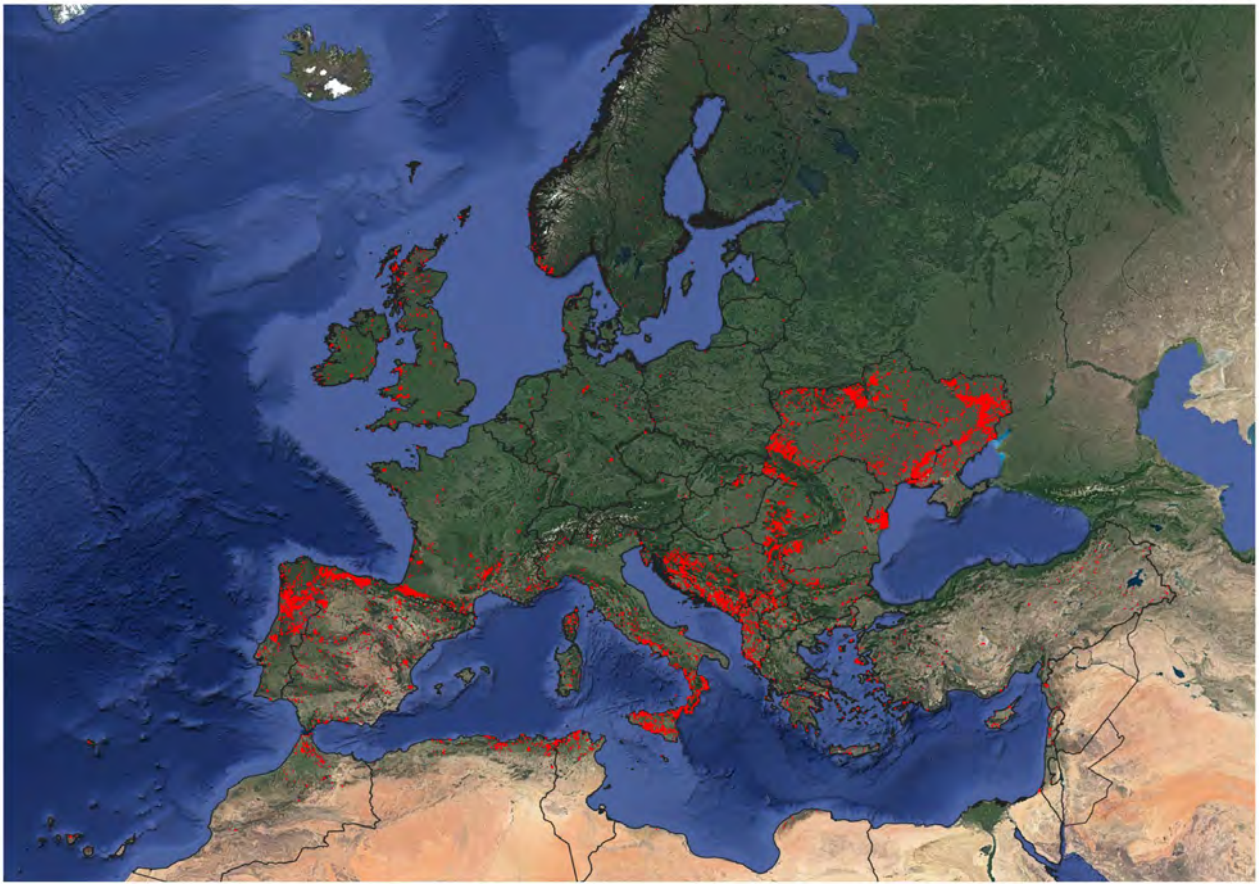
The *Key Recommendations on Wildfire Prevention in the Mediterranean* has been developed by the European Forest Institute and the Ministry for the Ecological Transition and Demographic Challenge of Spain (as coordinator of the FAO *Silva Mediterranea* Working Group on Forest Fires) in collaboration with Mediterranean stakeholders. Its content includes specific actions for each recommendation, identified as necessary to make any meaningful step forward in improving forest fire prevention and, therefore, risk reduction.

## Background and justification

Fire is a natural disturbance that has played a main role forming the Mediterranean's current landscape. Also described as landscape fires, wildfires have historically been present in many Mediterranean ecosystems. In the past, they often started from lightning and played a natural role. Today however, the vast majority of wildfires are anthropogenic, given humans' intense long-term presence in the Mediterranean region, and the secular use of fire as a tool for land management. This switch has created serious negative impacts on natural and cultural landscapes.

Wildfires are among the main threats to forests, the environment, ecosystem services, people and property. They contribute to desertification and degradation in rural and natural areas, as demonstrated by recent tragic events that also caused significant loss of human life and of ecologically important woodlands (Portugal 2017, Greece 2018, Turkey and Greece 2021).

Forest ecosystems and their associated natural, cultural and economic values have been heavily impacted by recurring, intense wildfires. This has seriously compromised their roles in providing resources, and environmental services, and supporting livelihoods. These functions are considered of great importance in major international strategic policies including bioeconomy, climate change and forestry. Preserving and protecting these functions and resources requires a coordinated vision, and an alignment of objectives. This is particularly because wildfires' recurrence and extent contribute significantly to degrading Mediterranean ecosystems.



Burnt scars produced by forest fires during the 2022 fire season. European Commission, Joint Research Centre, San-Miguel-Ayanz, J., Durrant, T., Boca, R., et al. 2023. *Advance report on forest fires in Europe, Middle East and North Africa 2022*, Publications Office of the European Union.

The current and future scenarios of wildfire risk are defined mainly by the age structure of rural communities, and the abandonment of rural areas (and their associated farming activities). These are contributing to forest expansion, climate change, and an increase of wildland-urban interface areas. The overarching scenario presents challenges for fire management systems and effective implementation of other related sectoral policies (e.g. rural development, conservation of protected natural areas, agriculture and urban planning) with which coordination is absolutely necessary.

The strategic management of wildfires continues to be tackled piecemeal, with emphasis on fire suppression and with disappointing results to date. Therefore, wildfire prevention needs to be integrated and as a crucial tool for managing wildfires. Backed-up by scientific evidence, there is a growing realisation that the issue is very complex, and that a common framework is needed for action at national, regional, and international levels. This will allow integrating all relevant public and private actors. A set of common objectives that consider the complexity of wildfire management must be established, and strategic guidelines and a global framework need to be defined. These will establish major shared and aligned roles and responsibilities, identifying the main relevant stakeholders in society and working with them with an all-inclusive approach.

## About the first edition

In 2011, FAO published the first edition of the Position paper on Wildfire Prevention in the Mediterranean, a synthesis of the conclusions and recommendations of two workshops where experts from the Mediterranean countries addressed wildfire prevention at international level. These workshops, 'Forest Fires in the Mediterranean Region: Prevention and Regional Cooperation' (Sabaudia, Italy, 2008) and 'Assessment of Forest Fire Risks and Innovative Strategies for Fire Prevention' (Rhodes, Greece, 2010), reviewed fire prevention systems in Mediterranean countries and identified new strategies and policies needed in this area.

The position paper was endorsed by the main Mediterranean stakeholders during the Second Mediterranean Forest Week organised in Avignon (France) from 5 to 8 April 2011. The document was an opportunity to address wildfire prevention in the context of climate change and to implement these recommendations in all countries of the Mediterranean. It was also presented as the collective position of Mediterranean stakeholders during regional sessions of the 5th International Wildland Fire Conference, held in Sun City (South Africa) on 11 May 2011.

## About the second edition

In 2021, a decade after the publication of the Position paper on Wildfire Prevention in the Mediterranean, the European Forest Institute (EFI) committed to updating this publication, along with the Spanish Ministry of Ecological Transition and Demographic Challenge (MITECO), the main promoters of the first edition. This second edition keeps the original structure, based on a series of general recommendations containing various proposed actions that have been updated to accommodate current and future scenarios. The focus of the original recommendations has been maintained, and their actions have been updated by modifying, removing or combining actions, and adding new ones or deleting those that have been considered achieved or no longer relevant.

The main difference of the second edition is the addition of a sixth recommendation: Adoption of a governance model tackling the diverse drivers and systemic causes of wildfire risk. This considered the basis for ensuring success of all the other recommendations and actions considered. In this recommendation, the actions are grouped according to the successive steps of the wildfire risk-management cycle.

This updated publication was launched and presented at the 8th International Wildland Fire Conference organised in Porto (Portugal) from 16 to 19 May 2023.

Photo: Spanish Ministry for the Ecological Transition and Demographic Challenge

# Executive summary

The main updates in the current list of key proposed actions on wildfire prevention in the Mediterranean are:

| Recommendation | Main updates |
|---|---|
| **No. 1** Integration of wildfire prevention in national forest programmes and policies, in climate-change adaptation strategies and in other relevant and related sectors | • Sustainable forest management and forestry activities should be given greater emphasis to make forests resistant and resilient to wildfires.<br>• Wildfire prevention should be integrated into national forest programmes, climate-change adaptation strategies and any relevant sectors.<br>• The integration of wildfire prevention in programmes and strategies is a continuous process: legislation should accommodate the evolution of conditions caused by climate change and socioeconomic changes, including dynamic risk mapping.<br>• The responsibilities of public and private actors are distinguished. |
| **No. 2** Adoption of a governance model tackling the diverse drivers and systemic causes of wildfire risk | • Stakeholder participation is meant to focus on actual decision-making on wildfire prevention strategies and plans.<br>• Multi-disciplinarity and integrative approaches should be part of wildfire prevention governance model development.<br>• Develop a participatory assessment and participatory mapping of risk perceptions and a participatory map of potential environmental and socioeconomic losses.<br>• Consider the interactions of more than one risk when assessing wildfire risk.<br>• Foster developing self-defence plans against wildfire, coordinated with higher-level plans but leaving local communities with options, responsibility and protocols of action.<br>• Avoid institutionalising wildfires to such a point that public participation no longer becomes possible: engage with 'fire stakeholders' as well as with 'non-traditional' stakeholders.<br>• Develop a governance model that links research and development with firefighters, civil protection and forest agencies. |

| Recommendation | Main updates |
|---|---|
| | • Provide support to build more resistant and resilient landscapes considering as many adaptation/risk reduction strategies as possible.<br>• Create an understanding of wildfire dynamics, focused on science-to-practice communication.<br>• Adapt communication to the needs of local communities using the most appropriate communication channels and formats.<br>• Promote peer-to-peer learning and communication. |
| **No. 3** Enhancement of sustainable financial mechanisms for preventing wildfires in the Mediterranean region | • There is now clearer distinction between two ways to achieve financial sustainability of wildfire prevention: by raising policymakers' awareness of the need to allocate appropriate funds, and by fostering self-sustaining socioeconomic activities in the forest that prevent wildfires as a subsidiary effect.<br>• Prevention costs should be compared to extinction costs in using internationally accepted standards, and this information should be shared internationally. |
| **No. 4** Promotion and generation of knowledge and education on wildfire prevention in the Mediterranean | • There are now proposed actions targeting communication specialists (in addition to researchers and educational specialists).<br>• Communication specialists should use the appropriate channels to convey information to specific target audiences, and this information should consider local and regional specificities.<br>• More emphasis is put on using social networks to communicate about wildfire prevention.<br>• Education specialists should collaborate with researchers to produce science-based training material. |
| **No. 5** Enhancement of harmonised information systems to deal with new wildfire risks in the Mediterranean | • EFFIS now covers, partially, non-European Mediterranean countries, however, not all data and applications are available for them.<br>• EFFIS data and applications coverage should be extended to encompass at least the Mediterranean biogeographical region.<br>• The wildfire community should promote the development of the Global Wildfire Information System (GWIS). |

| Recommendation | Main updates |
|---|---|
| **No. 6** Enhancing international cooperation on wildfire prevention in the Mediterranean | • International exchanges should include exchanges on governance, not only on management practices, targeting policymakers and authorities. |

Photo: Spanish Ministry for the Ecological Transition and Demographic Challenge

## Recommendation 1

# Integration of wildfire prevention in national forest programmes and policies, in climate-change adaptation strategies and in other relevant and related sectors

Wildfire prevention strategies cannot be considered in isolation; their integration into national forest programmes is necessary but not sufficient. As forests (and, more generally, land-use changes) influence climate change and are a source of socioeconomic value, any wildfire-prevention strategy should be integrated into adaptation strategies to climate change and into strategies of other sectors that may influence wildfire risk. A better integrated risk analysis along with increased focus on avoiding cascading effects and feedback loops (including emissions) could reduce the incidence of catastrophic wildfires to isolated extreme cases. Such changes would allow the possibility of engaging more specialised resources by involving new strategic sectoral policies.

### Proposed actions for decision makers

1. **Encourage the development of wildfire prevention plans, sustainable prevention policies and their related budgets.** To support wildfire prevention, we recommend integrating such plans, policies and budgeting into national and subnational adaptation strategies to climate change and other relevant policies. A common understanding of wildfire prevention (definition and activities) will facilitate developing and promoting revised templates and voluntary guidelines for wildfire prevention plans. Strategic actions offer a useful instrument for developing new policies or to adapt the existing ones with an integrated approach.

2. **Ensure that preventive actions are cross-sectoral, with more coordination between all stakeholders** (both public and private) across geographical scales, while avoiding excessive fragmentation of competences that hampers adopting integrative solutions.

3. **Clarify and enhance legal aspects through developing incentives and obligations concerning wildfire preventive actions** for public actors (e.g. municipalities) as well as for private actors and companies (private landowners, construction and insurance companies, etc.).

4. **Adapt legislation to shifting conditions caused by climate change** while facilitating and easing its application. Aligning and coordinating legislation from different related policies will help avoid or minimise counterproductive negative effects.

5 **Design preventive strategies that enhance landscape resilience, are dynamic, evolve according to ecological and socioeconomic changes, and also adapt to different socioeconomic and territorial contexts**, taking into consideration all influencing factors: (i) natural resources value; (ii) land ownership structure; (iii) administrative system; (iv) territorial level for planning; (v) ecological and socioeconomic dynamics; and (vi) urban development. Locally-produced solutions will often lead to greater buy-in from all stakeholders.

6 **Develop specific tools to strengthen support for, and implementation of, wildfire prevention.**
Recommended actions include:

a. Collect data on the cost of prevention, suppression and restoration to reach the balance between investments in each area
b. Establish an interdisciplinary national committee for data collection and validation
c. Standardise and harmonise data, and integrate these into national and European forest inventories/information systems
d. Estimate the economic impact of wildfires, including all values affected
e. Balance prevention and suppression policies at all levels
f. Enhance cooperation between all relevant stakeholders in prevention processes, including spatial planning
g. Promote forest education and applied-research programmes
h. Develop sustainable financial instruments.

7 **Promote integrated fire management approaches and link them to territorial planning and forest and agricultural management schemes.** Consider all relevant stakeholders and allow fora for debate and for developing consensus for actions.

**Integrated fire management** is a concept for planning and operational systems that includes social, economic, cultural and ecological evaluations with the objective of minimising the damage and maximising the benefits of fire. These systems include a combination of prevention and suppression strategies and techniques that integrate the use of technical fires.

A **technical fire** is a fuel management tool that implies the controlled use of fire carried out by qualified personnel under specific environmental conditions and based on an analysis of fire behaviour and territorial context. Technical fires are divided into prescribed fires, backfires, and regulated traditional burning (the use of fire by rural communities for land and resource management purposes based on traditional know-how).

8 **Promote sustainable forest management as an important part of wildfire prevention.** This is particularly important for wood and non-wood forest products' harvesting, processing and consumption. Integrating and promoting such sustainable management in national policies will improve wildfire prevention.

9 **Develop wildfire prevention policies that enhance forest resistance, resilience and protection,** considering the role that Mediterranean forests can play in the climate-change context. We recommend providing alternative approaches to protected areas as untouched ecosystems without prevention measures and related human interventions. It is important to promote using existing financial resources in the context of fighting climate change for the implementation of wildfire prevention measures, as well as supporting climate-smart forestry.

## Proposed actions for land managers

10 **Include a proposed minimum of essential actions in forest management plans as follows:**

a. Analyse and identify strategic management zones, based on the study of historic wildfires, topography and fuel models
b. Manage fuel, considering all possible techniques depending on the context and specific needs, in order to limit wildfire risks (such as biomass reduction or prescribed use of fire)
c. Using forest infrastructure for fire suppression (such as roads and water points)
d. Integrating social prevention measures (such as public awareness and local population participation)
e. Integrating spatial planning (such as urban planning and land management).

11 **Consider different risk scenarios, territory characteristics, the evolution of ecological conditions under different global changes, and the evolution of socioeconomic conditions in wildfire prevention plans.** These should include the principles of sustainable landscape management, considering the different land uses in the Mediterranean territories and how they may shift in the future. This is a continuous process, as the uncertainty of predictions increases along with the forecast horizon.

12 **Implement dynamic risk mapping at different geographic scales** to detect new territories at risk. For example, wildland-urban interfaces (local scale) and regions becoming fire-prone due to climate change (regional scale), where specific preventive measures should be considered. Once these have been detected, we recommend developing information and training programmes, and associated technical support necessary to implement prevention and self-protection measures, and consider these needs at the urban planning level.

13 **Stress wildfire prevention actions instead of a suppression-only approach.** We recommend participatory and bottom-up approaches that will identify or develop prevention actions, such as community-based fire management. The results of these approaches are more likely to be accepted by the stakeholders and local community.

## Recommendation 2

# Adoption of a governance model tackling the diverse drivers and systemic causes of wildfire risk

Proposed actions, procedures and projects should be designed to unblock current bottlenecks and to build long-term national cohesive strategies for wildfire risk, considering governance principles such as impact orientation and sustainability, stakeholder inclusion in policy design, feed-back and feed-forward (strategies to anticipate future scenarios), accountability, transparency, adaptivity and learning.

Accommodating actor participation and collaboration across organisational levels, territorial scales and networks, examining the local context and values, and considering the different modes for wildfire risk adaptation and anticipation contribute to the expansion from risk management to risk governance.

The following actions are grouped under the different steps of the wildfire risk-management cycle.

### Stakeholder engagement: inclusive risk-related decision-making and conflict resolution, regarding multi-level policy design, sustainability, and funding

1. **Stakeholder participation aims to focus on actual decision-making at the local level and coordination at upper levels.** This will empower local communities and build their capacity involving appropriate institutions, training, enough time and other resources, technical support and professional facilitation. Engaging stakeholders in decision-making and conflict resolution generates sustainable solutions with communities' buy-in.

2. **Use multi-stakeholder participatory platforms,** and recover and/or develop local participatory institutions devoted to wildfire prevention and assessment. These will develop wildfire prevention strategies and plans to: build scenarios; identify, analyse and assess risks; evaluate potential losses; propose objectives and lines of action; prioritise problems; engage in action; monitor and evaluate; exchange experiences; and develop peer-to-peer communication amongst other areas.

3. **Use multi-level coordination,** ensuring that all agents honour their commitments and assignments, showing real involvement in the management of wildfire risk.

4. **Foster multi-disciplinarity and integration under a sustainability framework of the different fields of knowledge and action,** both traditional and academic, behind the diversity of land uses and elements: forestry, pastoralism, woody crops, fruit orchards, hunting, tourism, nature protection, and civil protection amongst others.

5 **Promote interagency exchange and collaboration at a national level** to ensure the necessary involvement of the different sectoral policies.

## Risk assessment: wildfire hazard identification, exposure & vulnerability, risk characterisation and perceptions, and socioeconomic concerns

6 **Assess the role of forest lands in the socioecological dynamics of each area,** with an analysis of the activities, goods and services put at risk by wildfires (environmental and socioeconomic vulnerabilities and exposure to wildfire).

7 **Develop participatory assessment and participatory mapping of risks under local communities' perceptions,** including social research tools, in their language to produce risk indices to identify the most at-risk areas.

8 **Analyse the role of fire in the current scenario:** abandonment, urbanization, homogenization, climate change and land-use change.

## Risk evaluation: judgement of the risk level, risk reduction options, acceptability of losses and the need for risk-reduction measures

9 **Develop scenarios including different wildfire hazards and perform a subjective analysis of risks** across sectors and stakeholders, as risk is not objective.

10 **Develop a participatory map of potential environmental and socioeconomic losses under local communities' perception** (values of land; production and development potential; goods and services; water; landscape aesthetics; and tourism, amongst others).

11 **Consider the interactions of more than one risk** when assessing wildfire risk (e.g., soil erosion and landslide risks after the loss of vegetation cover caused by a fire, or pest outbreak risks).

12 **Perform an intra-government and public evaluation** of fire risk across countries.

## Risk management (a): integration of civil protection dimension with the forest/rural areas dimension in wildfire management (cutting silos)

13 **Develop participatory plans for wildfire prevention,** including silviculture, peri-urban clearings, infrastructure management, awareness campaigns, etc.

14 **Develop self-defence plans against wildfire,** coordinated with higher level plans but leaving local communities with options, responsibility and protocols of action that are participatory and community-managed, embedded in local institutions.

15 **Optimise institutionalising wildfire prevention** to avoid prohibiting public participation. There are local initiatives that work well on wildfire prevention. Instead of excluding them, they should be analysed, fostered and further supported. As examples:

a. Engage with 'fire stakeholders' (e.g., people who use fire for a given reason) and give them a voice in fire-management discussions, in order to express themselves and explain their needs and challenges.
b. Engage with non-traditional stakeholders and connect the wildfire agenda to theirs (e.g., farmers, shepherds, educational institutions, environmental associations, etc.).
c. Promote initiatives that link research and development with firefighters, and civil protection and forest agencies.

**Risk management (b): adaptive management with process monitoring and planning, evaluation for continuous improvement and lessons learned. Analysis of physical and social impacts due to changes in fire governance**

16 **Foster participatory land planning,** incorporating wildfires into the strategic vision of land uses towards resilient landscapes that considers: productive firebreaks, agroforestry, silvopastoralism, extensive pastoralism, silviculture, woody crops, and infrastructures amongst others.

17 **Foster participatory wildfire prevention and integrated management plans,** including the civil protection dimensions (people, pets, livestock, homes, properties, crops, private lands, communal lands, public lands, etc.).

18 **Recover and update participatory institutions governing land uses:** institutions formed by the inhabitants of a territory themselves, who decide on access to, and management and distribution of resources (mainly communal forests and rangeland), and who have sufficient operational capacity and authority to implement these measures. Some examples are the Moroccan agdal gardens and farmland, the Iberian neighbourhood councils, and the pasture-users' associations in central Asia. These institutions should be updated in terms of gender equality, equity, and capacity for action.

19 **Provide support to build more resilient landscapes** considering as many adaptation or risk reduction strategies as possible, such as agricultural extension, technical assistance, or financing and supporting fire-resilient productive activities in wildfire risk areas.

**Risk communication: exchanging or sharing risk-related data, information and knowledge between and among different groups such as scientists, policymakers, industry and public; and publicly report the system's performance**

20 **Create an understanding of wildfire dynamics,** focused on science-to-practice communication.

21 **Adapt communication to the needs of local communities** in terms of language, media, authorship, interests, etc.

22 **Assess the most appropriate communication channels and formats** at different territorial scales to cover the population but also to incorporate very motivated and engaged stakeholders that do not fit into the usual channels.

23 **Use simple, user-friendly apps running on mobile devices** for local stakeholders to collect, monitor, assess, and retrieve information and run protocols.

24 **Make risk communication towards the public less expert, top-down driven,** and instead recognise and give space for the actions, knowledge and experiences already existing on the ground.

25 **Promote peer-to-peer learning and communication,** experience exchanges, cross-visits, gatherings and recreational activities as a way of improving communication.

26 **Be more collaborative with the media.** They are allies in communicating messages around wildfires. Promote specific training initiatives to ensure optimal knowledge of sustainable forest management and wildfire management. Become a reference and reliable source for the media.

27 **Exploit the available but as yet non-communicated information.**

Photo: Shutterstock

## Recommendation 3

# Enhancement of sustainable financial mechanisms for preventing wildfires in the Mediterranean region

Given wildfires' social, economic and environmental repercussions, increased financial investments and development of sustainable financial mechanisms could be achieved as a way of allowing and improving tangible results.

Planning preventive actions with a long-term vision and as permanent activities is crucial. Although historically they are not perceived by the public as visible and relevant as suppression resources and actions, preventive actions should receive more community, media and political attention and commitment due to their high potential return on investment. Consequently, adequate financial resources should be allocated. In the Mediterranean region, forest conservation is linked to improved structures, reduction of fuel loads and fuel continuity. This can only be sustainable in the long-term if adequate value chains are developed based on market goods and ecosystem services.

### Proposed actions

1. **Researchers should inform both public decision makers and private enterprises,** based on technical and scientific evidence, about the advantageous cost-benefit ratio of wildfire prevention measures compared with reactive measures, so that priority is given to the former.

2. **Raising Mediterranean politicians' and decision makers' awareness of the importance of wildfire prevention actions and their specific budgetary needs,** will reduce the probability of occurrence and the effects of wildfires. We recommend that budgets allocated to prevention measures represent at least 50% of the total amount that agencies allocate to integrated fire management.

3. **Promote the economic dimensions of forests through forestry and agro-silvopastoral activities which generate revenue and, at the same time, have wildfire prevention as a subsidiary effect** (such as grazing, agroforestry, forest exploitation or resin tapping). We recommend combining these activities with those aimed exclusively at wildfire prevention. This requires a better knowledge of the socioeconomic dimension of forests and the monetisation of ecosystem services.

4. **As much as possible, funding schemes should be multi-objective and self-sustained by economic activities or the monetisation of ecosystem services.** We recommend that funding schemes are not attached to specific prevention plans and programmes, and have special emphasis on forestry as well as agricultural activities that enhance fire prevention as a subsidiary effect.

5. **Establish sustainable, clear, accessible and flexible funding procedures that** assure funding reaches local actors and facilitates involving local communities.

6 **Make European Union funds for wildfire prevention available for non-European Mediterranean countries** as well. Greater participation in wildfire prevention will be achieved by clarifying and communicating all the possible options among the different funds.

7 **The allocation of European funds and international cooperation, in general, should imply comparable information in order to evaluate and follow-up the efficiency and effectiveness of prevention measures.** We recommend developing and integrating standard indicators across the Mediterranean for monitoring preventive activities. The effects and the efficiency of prevention measures should be evaluated and compared with suppression efforts, to prove that the money spent in prevention has averted even more costly wildfires.

In order to gain in cohesiveness, forest firefighters should be involved in fire prevention actions, not only in suppression. Fighting a wildfire requests a deep knowledge of the territory and the fire dynamics. This knowledge and experience are reached through working during all year round in prevention and suppression activities. One of the main threats to wildfire prevention policies is the disengagement with wildfire suppression policies and vice-versa.


Photo: George Mitri

## Recommendation 4

# Promotion and generation of knowledge and education on wildfire prevention in the Mediterranean

Knowledge gaps need filling by researchers, and knowledge available needs to be disseminated by education specialists, public agencies and media. Both lines of action should consider local and national stakeholders and specificities to succeed. They should use appropriate channels to convey wildfire awareness and prevention messages, including on-site channels, in forests and other natural areas, and social networks to reach different target audiences. For example, traditional land use in rural areas and capitalisation of using traditional fire are considered reasonably effective preventive methods, but require engaging local and subnational communities. The final aim of knowledge acquisition and dissemination is to reduce the risk of wildfires by adapting ecosystems and preparing society for their occurrence. Therefore disciplines from educational, environmental, social and economic sciences are requested in this effort.

### Proposed actions for researchers

1. **Implement studies on fire systemic causes related to socioeconomic changes (including the use of fire in rural areas) and possible preventive actions in cooperation with the local population, communities and local and subnational governments.** Scientific research needs to facilitate a transition from the outdated, unsustainable linear economic models to a circular, integrated, sustainable and bio-based economy at scale. This should lead to better insights into fire causes and facilitate analysing existing prevention actions to develop new prevention approaches and share best practices.

2. **Promote scientific applied research programmes addressing the consequences of climate change, land use, land cover and socioeconomic changes on fire regimes, environment and society** in the Mediterranean, with special emphasis in the North African and the Middle Eastern countries. We recommend research programmes that involve international cooperation, including large-scale pilot programmes and seeking collaboration and coproduction with practitioners and other stakeholders.

3. **Use the Mediterranean Forest Research Agenda (MFRA) as a key reference** (amongst others) to identify and prioritise wildfire prevention research activities. The MRFA articulates the main forestry research priorities for the Mediterranean region by decade.

## Proposed actions for educational specialists

4 **Produce and distribute awareness and educational materials on wildfire prevention, specifically for the different parts of the Mediterranean region, in the local languages.** By respecting the regional particularities and involving forest stakeholders and scientists, such a campaign has a greater chance of high impact on local populations. Also, as the Mediterranean is very frequently visited by tourists during the wildfire season, specific awareness and educational materials should be developed for them (using as reference the work of expert groups such as the UNECE/FAO Forest Communicators Network).

5 **Develop and implement international training courses on wildfire prevention for land and forest managers with harmonised objectives and training methodology as a common framework.** However, subnational specificities should be incorporated to make it more meaningful for local communities, and for land and forest managers. Local exchanges and results from multi-actor publicly-funded projects should also be incorporated. This training should include field training.

6 **Include raising awareness and education in all education programmes using an integral approach,** considering forests and agriculture; bioeconomy; ecosystem services; the role and history of fire in the landscape, and traditional culture linked to fire management. We suggest that the approach will contribute to better understanding of ecology and the development of the risk culture. Education materials should be adapted to subnational contexts and produced for all levels of education to promote wildfire prevention, especially in regions with high wildfire risks and incidence.

## Proposed actions for educational specialists

7 **Raise public awareness when communicating about wildfire events, by highlighting the importance of sustainable forest management as a tool to prevent wildfires** or to reduce their intensity and therefore prevent major disasters. This should help to raising funds for sustainable forest management (especially in low-productivity areas). When communicating about wildfire prevention activities, it will be critical to highlight those activities that may not be perceived as important by the general public, such as prescribed burning, grazing, resin tapping or cork debarking.

8 **Take advantage of every opportunity to draw attention to wildfire prevention in order to increase visibility in all relevant events,** such as those more directly related to wildfire management. These include: the Committee on Forestry (COFO), the Mediterranean Forest Week and the Ministerial Conference of Forest Europe, as well as those in other sectoral policy events. In addition, we recommend sharing the same approach through relevant expert groups, both directly or indirectly related to wildfire management.

9 **Develop local and subnational specific communication material on wildfire prevention for the media and social networks by educational specialists in collaboration with researchers.** The messages provided are of outmost importance since they will influence the correct or incorrect understanding of wildfire factors, challenges and management. Population support is crucial, and it will only be reached if the information provided is accurate.

To ease communication among researchers, educational specialists and communication specialists, it is crucial to promote a common, harmonized and agreed terminology on wildfire management, and implement it in existing multilingual thesauri such as FAO AGROVOC Multilingual Thesaurus or the 'Forest Fire Fighting Terms Handbook' from GFMC. In addition, common definitions would aid in better international comparison of data and in the development of a standard for wildfire reports for all Mediterranean countries. The usage of this terminology should be supported with related training. The languages of the terminology should be chosen to represent the language diversity in Mediterranean countries.

Photo: George Mitri

## Recommendation 5

# Enhancement of harmonised information systems to deal with new wildfire risks in the Mediterranean

Historical information on wildland fires is critical for analysing phenomena associated with new wildfire risks, for designing prevention strategies, and for making decisions during an emergency. This requires ongoing improvement in data gathering and accuracy for wildfire statistical records, and the use of regional and global databases. This is particularly true for the European Forest Fire Information System (EFFIS) and the Global Wildfire Information System (GWIS). To enhance data analysis and processing capabilities, we recommend improving data recording and reporting. This should include automatic data capture from diverse sources (remote sensing, meteorology, etc.) as well working on the compatibility and convergence of different national information management systems to enhance their analysis and processing capabilities.

### Proposed actions

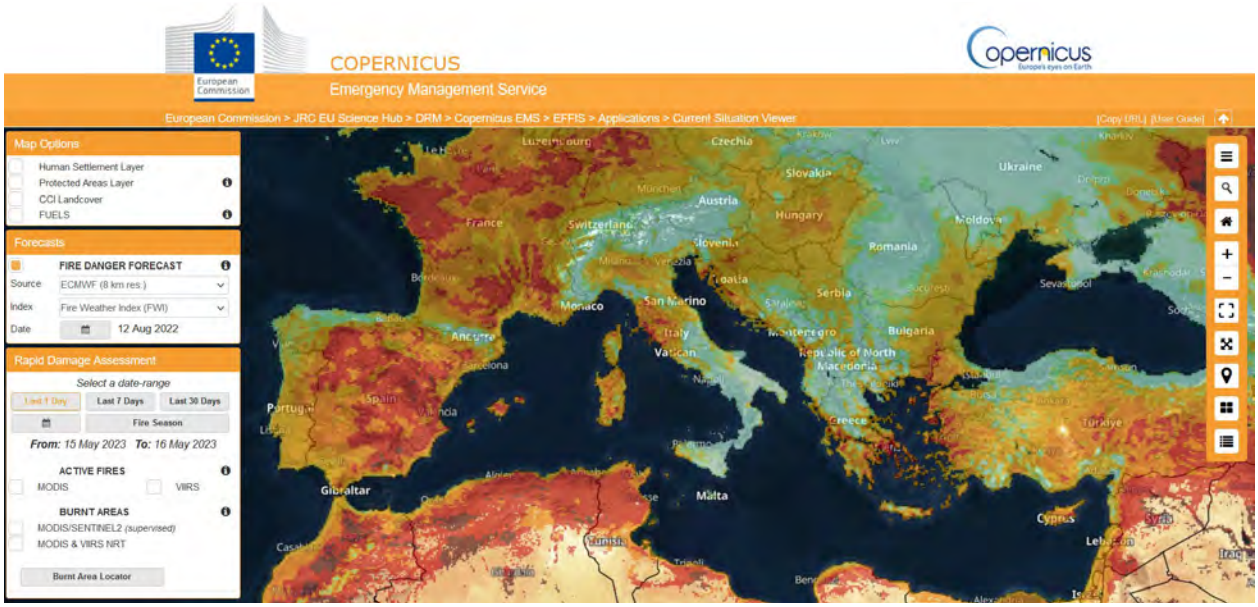
1. **Share updated information between countries on structural prevention issues** (e.g. area of properly protected forest; area of fuel managed each year; techniques used for fuel management; wood net primary production and harvesting; and issues linked to land use, such as pasture or other uses).

2. **Improve existing mechanisms and common guidelines for data collection and forest monitoring** in order to share information and knowledge transparently and accessibly on wildfire prevention including:
   a. Improving knowledge on wildfire causes and motivation by using an interdisciplinary approach to causality evaluation to avoid bias (a harmonised approach for collecting these data was developed by the EC and the Expert Group on Forest Fires and adopted in many of the countries in this group).
   b. Analysing wildfire emissions and impacts on human health.
   c. Analysing regional investments in wildfire prevention in order to evaluate their efficiency and results.
   d. Defining wildfire at-risk areas, considering fire incidence, fuels, value of forests, protected areas, wildland-urban interfaces and land ownership (a pan-European approach to wildfire risk assessment was developed and a related report published in 2022 by the EC and the Expert Group on Forest Fires).
   e. Conducting studies on the silvicultural condition of woodland areas, including forest fuel and biomass maps, in coordination with the National Forest Inventories. Fuel maps are regarded as highly important tools. These need to be built both at subnational and local levels following consistent methodologies.
   f. Analysing the socioeconomic impacts of wildfires, as well as the socioeconomic vulnerability of the area at risk.

g. Forecasting climate-change impacts on wildfire danger, risk, and the cascade effects of fires (European-wide studies have been implemented on this topic by the Joint Research Centre (JRC) and should serve as a basis for further work on this topic).

3 **Maintain, improve and enlarge the European Forest Fire Information System (EFFIS)** with standardized procedures for data collection and develop the use of remote sensing as a tool to identify high-risk zones through adequate risk cartography with an appropriate spatial and temporary resolution. We recommend promoting the further development of the Global Wildfire Information System (GWIS), and collaboration with fire managers beyond the current Mediterranean regional scope. This should include:

a. Extending EFFIS geographical data coverage over the whole Mediterranean biogeographical region. This will address the flagrant lack of coverage data in the application 'Wildfire Risk Viewer'.
b. Include additional information in EFFIS on wildfire prevention (including causes and motivations, at least for large forest fires) in order to identify the situation and the specific needs of each country. Information on wildfire prevention is important for exchanging ideas and approaches. Relevant indicators for harmonised EU monitoring of wildfire prevention should be defined, and data should be collected and reported, with a special focus on large forest fires. We recommend developing detailed databases on wildfires, consistent with the EU/Mediterranean system, at national level, in EU non-EU Mediterranean countries. This should also include national fire danger rating systems (the EFFIS fire database and fire danger forecast should be considered as the core scheme to be used).
c. In EFFIS Wildfire Risk Viewer, expanding and adapting the 'wildfire-risk', 'danger', and 'vulnerability' indices to southern Mediterranean countries that accommodate the different ranges of climatic conditions.
d. Filling wildfire information gaps in some countries. We recommend reinforcing the national forest inventories to collect and share this information with EFFIS.




Source: European Forest Fire Information System

## Recommendation 6

# Enhancing international cooperation on wildfire prevention in the Mediterranean

Involvement in international cooperation is urgently needed. It is imperative for generating or strengthening the various synergies among agencies and organisations, and their integration in order to gain interoperability. Taking into consideration each country's own characteristics and making the adaptations needed, it is necessary to identify and develop general common frameworks and guidelines to be applied in countries with biogeographical similarities. We recommend enhancing international cooperation that targets those countries in greatest need of wildfire management. These countries should receive support for activities such as knowledge transfer, capacity building and networking from international to local level.

### Proposed actions

1. **Encourage agencies and groups to develop their risk assessment and fire management voluntary guidelines,** based on existing reference documents and on experiences in other countries. Voluntary agreements help to reduce conflicts with public agencies.

2. **Consider existing regional networks** such as the FAO *Silva Mediterranea* Working Group on Forest Fires; the FAO Near East Network on Wildlands Forest Fire (NENFIRE); the UNDRR Regional Southeast Europe / Caucasus Wildland Fire Network; the UNDRR Sub-Regional Euro-Alpine Wildland Fire Network; the UNDRR Global Fire Monitoring Center (GFMC), and the EU Commission Expert Group on Forest Fires (EGFF). These offer competences for the European Forest Fire Information System (EFFIS), as new international cooperation activities develop in the Mediterranean, and especially those that involve existing non-formal networks that would benefit from international cooperation.

3. **Promote exchange programmes on capacity development and knowledge transfer,** including public and private sectors, with periodic activities. These exchanges should be supported by a dedicated technological information and communication platform, such as the EU Civil Protection Knowledge Network. More precisely such promotion may effectively include:
   a. Disseminating and sharing experiences, building up and replicating best practice for integrated fire management, namely by promoting international exchanges between fire professionals of all levels, especially among practitioners from similar ecoregions and contexts.
   b. Disseminating and sharing experiences, building up and replicating best practices in wildfire governance, namely by promoting international exchanges between authorities and policymakers of all levels and disciplines, across countries and ecoregions.

4 **Integrate wildfire prevention in the United Nations, European Commission and other relevant international organisations agendas,** at technical and high political levels.

The **Global Fire Management Hub** was announced by FAO and UNEP at the XV World Forestry Congress in May 2022 and welcomed by FAO Members during the 26th session of the Committee on Forestry, and was launched at the 8th International Wildland Fire Conference in May 2023. The aim of the Global Fire Management Hub is to strengthen countries' capacities to implement integrated fire management with the major impact of reducing the many negative effects of wildfires on people, landscapes, and global climate. It brings together fire experts located in regional offices and key partners working on wildfires, including the Joint Research Centre (JRC) of the European Union, the Global Fire Monitoring Center (GFMC), and leading national organisations, among others. Key regional projects on integrated fire management (e.g. the existing Assuring the Future of Forests with Integrated Risk Management (AFFIRM) Mechanism) will feed the Hub.

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# Annexes

## Methodology of the second edition

The process of updating the *Position paper on Wildfire Prevention in the Mediterranean* was divided into two steps: 1) assessment and update of the recommendations, and 2) assessment and update of the actions.
To assess the relevance of the recommendations of the first edition, EFI and MITECO launched the on-line survey *Ten years of wildfire prevention in the Mediterranean*. It was open from early January 2022 to mid-April 2022. The survey had ten questions regarding the current situation and future priorities in wildfire prevention in the Mediterranean. Target audience were the members of the FAO *Silva Mediterranea* Working Group on Forest Fires and Mediterranean wildfire experts from academia and institutions. The results of the survey were presented and debated at the 7th Mediterranean Forest Week organised in Antalya (Turkey) from 21 to 25 March 2022.
This was the starting point for the assessment and update of the actions. EFI and MITECO mobilised the wildfire community, including forest managers and researchers to collect their opinions about how the actions of the first edition of the *Position paper* should be updated and to gather new actions for the recommendation *Adoption of a governance model tackling the diverse drivers and systemic causes of wildfire risk*. The following activities were organised to collect opinions and new actions:

| Activity | Dates | Format | Target audience |
|---|---|---|---|
| On-line survey | From 5 October 2022 to 30 January 2023 | Freely accessible on-line survey, one questionnaire per recommendation | Mediterranean forest and wildfire experts, researchers and practitioners |
| Fire Ecology Across Boundaries Conference side event (Florence, Italy) | 5 October 2022 | In-person round-table | European experts on wildfire |
| Joint Workshop: Develop, adopt and transfer innovative solutions and actions to prevent and control wildfires (Antalya, Turkey) | 25 October 2022 | In-person round-table | Mediterranean experts on wildfire |
| On-line session with the Pyrolife early-stage researchers | 22 November 2022 | Guided session in an on-line collaborative document | European early-stage researchers on wildfire topics |
| EFI Mediterranean Network Forum side event (Barcelona, Spain) | 28 November 2022 | In-person round-table | Mediterranean forest managers |

Photo previous page: Spanish Ministry for the Ecological Transition and Demographic Challenge

The different activities allowed respondents and participants to modify actions, delete those considered achieved or no longer relevant, and add new ones. For the recommendation *Adoption of a governance model tackling the diverse drivers and systemic causes of wildfire risk* the only possibility was to propose new actions. EFI and MITECO collated these answers and used them to update the text of the first edition of the *Position paper*. Finally, the draft text was sent to all the respondents and participants, and to members of the FAO *Silva Mediterranea* Working Group on Forest Fires, to review and comment on it. EFI and MITECO collated the reviews of this second round and prepared the text for publication.

## Results supporting the update

The survey *Ten years of wildfire prevention in the Mediterranean* attracted 75 respondents, mainly from Spain and Portugal. Public institutions (other than research) represented most of the respondents (55%), while 36% came from the academia/research and 9% from third-sector entities.

The following statements summarise respondents' general perceptions:

- Changes in land use together with climate change are seen as the major drivers of wildfires.
- Suppression approaches seem to dominate wildfire management.
- Sustainable forest management with special attention to fire-smart landscape planning is a priority for most experts.
- In most regions, top-down approaches predominate compared with participatory approaches to fire management.
- Improved evaluation of existing financial mechanisms is needed.
- Knowledge and education on wildfire prevention has improved in the past 10 years.
- Politicians are unaware of the importance of prevention and local citizens are potentially unprepared.
- Involvement in international collaboration is quite strong.
- While the recommendations of the first edition of the Position paper on Wildfire Prevention in the Mediterranean still hold importance, community involvement/local participation are likely to require more emphasis in the future.

As conclusions from the survey and the debate, efforts to update the Position paper on Wildfire Prevention in the Mediterranean should be mainly focused on actions of the following recommendations (using the numbering and wording of the first edition):

- No. 2. *Integration of wildfire prevention in national forest programmes/policies and in adaptation strategies to climate change,*
- No. 3. *Promotion of knowledge and education on wildfire prevention in the Mediterranean,*
- No. 4. *Enhancement of sustainable financial mechanisms for prevention of wildfires in the Mediterranean* (this recommendation was perceived as the one that showed less improvement during the previous decade).

Recommendations no. 1. *Enhancement of the international cooperation on wildfire prevention in the Mediterranean* and no. 3 *Promotion of knowledge and education on wildfire prevention in the Mediterranean* were perceived as those whose activities have improved the most in the previous decade, although respondents signalled that the latter needed to keep improving during the following years.

The other main conclusion was confirming the need for a new recommendation on wildfire risk-governance.

Activities assessing the actions allowed participation of representatives from diverse geographical origins (from the northern and southern Mediterranean) and

profiles (practitioners, researchers and early-stage researchers on wildfire, but also forest managers). As a final step, the updated text was sent to 55 respondents and participants of these activities, to the members of the FAO *Silva Mediterranea* Working Group on Forest Fires and to the organisations that supported the first edition of the *Position paper on Wildfire Prevention in the Mediterranean* to gather comments, where appropriate. Four replies were received, collated and included in the final version of the text.

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European Forest Institute – Mediterranean Facility (EFIMED) promotes and conducts research on innovative actions to enhance global knowledge related to Mediterranean forests. Through its network, EFIMED connects forest researchers, policymakers, and practitioners across the region, and works to bridge the gap between forest-related science, policy, and implementation, for better understanding and management of Mediterranean forests. EFIMED receives funding from the Spanish Ministry of Science and Innovation.

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