FIREURISK - DEVELOPING A HOLISTIC, RISK-WISE STRATEGY FOR EUROPEAN WILDFIRE MANAGEMENT

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Executive Summary

This report, which is part of the FirEURisk project, takes a close look at how European Union (EU) policies and legislation are managing the risk of wildfires and protecting both people and natural resources. The report examines the wildfire management strategies of various European countries and evaluates their effectiveness. It also explores the role of the European Commission in wildfire management, including the use of the European Forest Fire Information System (EFFIS) and the EU's Forest Fire Prevention and Management Directive. Additionally, the report examines the impact of EU funding programs, such as H2020, Horizon Europe for Research, and the European Union Solidarity Fund. The report highlights best practices in wildfire management, such as forest thinning, prescribed burning, and technological advancements for better preparedness and risk mitigation. Ultimately, the report emphasizes the need for effective policies, coordinated efforts, and continued investment in technology and research for better wildfire prevention and response. It concludes with recommendations for policy improvements, which will be included in the subsequent deliverable D6.15. The report is structured to provide a comprehensive overview of wildfire management policies across Europe, with each country's approach discussed in separate subsections.

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List of Acronyms

Table 1: List of Acronyms

List of Acronyms	
AGIF	Agency for Integrated Rural Fire Management
ANEPC	National Authority for Emergency and Civil Protection
BRIF	Spanish Forest Fire Fighting Service
C&C	Command and Control System
CFS (SPAIN)	Catalonian Fire Service
CFS (ITALY)	Corpo Forestale dello Stato
DRMKC	Disaster Risk Management Knowledge Center
EFFIS	European Forest Fire Information System
ERCC	Emergency Response Coordination Centre
HFS	Hellenic Fire Service
ICNF	Portuguese Institute for Nature Conservation and Forests
ICAV	Institute of Agrarian and Veterinary Sciences
ONF	Office National des Forêts
PCI	Protezione Civile Italiana
UCPM	EU's Civil Protection Mechanism

**The acronyms mentioned only once are explained in the respective section of the deliverable.*

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1 Introduction

Wildfires have become an increasing concern in Europe, with a rise in the frequency and intensity of wildfires over the past few decades. The European Union (EU) has recognized the need for effective wildfire management policies and has provided guidelines and funding to member states to support wildfire management efforts. This deliverable of FirEUrisk provides a comprehensive review of the wildfire policies and legislation in selected European countries, focusing on their peculiarities and efficiency in reducing the risk of wildfires and protecting human and natural resources.

1.1 Purpose of the Document

The deliverable presents an overview of the current wildfire situation in Europe, including trends in wildfire frequency, size, and severity. A review of the wildfire policies and legislation in selected European countries, represented in the FirEUrisk consortium, including countries in South, Central and North Europe follows. The review includes focused comments and hints on the policies and legislation in each country, as well as their effectiveness in reducing the risk of wildfires and protecting human and natural resources.
The deliverable also examines the role of the EU in wildfire management, including references related to the European Forest Fire Information System (EFFIS), which provides real-time information on wildfires across Europe, and the EU's Forest Fire Prevention and Management Directive, which requires member states to establish wildfire prevention and management systems. Additionally, D6.14 include feedback on the effectiveness of EU funding programs, such as the H2020 and Horizon Europe for Research and the European Union Solidarity Fund, which provides financial assistance to member states affected by natural disasters, including wildfires.
Best practices in wildfire management are also mentioned here, such as forest thinning, prescribed burning, and other forest management practices aimed at reducing the buildup of flammable material as well as the role of technology in wildfire management, including remote sensing, and scientific fire management to improve preparedness and mitigation of wildfire risk.
This report offers valuable insights into Europe's wildfire policies and legislation, which can be used to make recommendations for improving wildfire management and reducing future risks. It emphasizes the importance of effective policies and coordinated efforts in managing wildfires. It also highlights the need for continued investment in technology and research to enhance wildfire prevention and response efforts. The recommendations will be included in the D6.15.

1.2 Structure of the Document

Here is the structure of the deliverable D6.14:
The document’s Introduction offers an overview of its purpose and a brief summary of the wildfire situation in Europe. The document's main body, the Review of Policies, begins by discussing the Cardiff process and European policies relevant to wildfire management. An in-depth analysis of national wildfire management policies in several European countries, such as Portugal, Spain, France, Italy, Greece, Croatia, Bulgaria,

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Romania, Sweden, Cyprus, Germany, Finland, the United Kingdom, and Ukraine, follows this. Each country's policies are discussed in separate subsections, providing a comprehensive overview of the various approaches to wildfire management throughout Europe. The final section, Conclusions, summarizes the policy review's discoveries, followed by concluding thoughts.

The information on wildfire management policies from various countries through the FirEUrisk questionnaire can be found in the Annex. The responses are organized by country, including Portugal, Spain, France, Cyprus, Germany, Sweden, Romania, Finland, the United Kingdom, Bulgaria, Italy, Ukraine, Israel, and the Netherlands. This structure allows for a comprehensive and detailed review of European wildfire management policies, providing valuable insights for the FirEUrisk project.

1.3 Overview of the wildfire situation

Wildfires have become a growing concern in Europe, with the frequency, size, and severity of wildfires increasing over the past few decades. Many European Union (EU) member states have been affected by wildfires, including Greece, Portugal, Spain, Italy, and France.

Climate change is one of the primary factors contributing to the increase in wildfires in Europe. Rising temperatures, changing precipitation patterns, and increasing frequency and intensity of heat waves are creating ideal conditions for wildfires to start and spread. In addition, land use changes, such as the abandonment of traditional land use practices, are leading to the buildup of flammable material, increasing the risk of wildfires.

The Mediterranean region, in particular, has experienced a significant increase in the frequency and size of wildfires in recent years. Southern European countries, such as Greece, Italy, Spain, and Portugal, have been particularly affected. In 2017, Portugal experienced devastating fires that resulted in the loss of 118 lives and the destruction of over 442,418 hectares of land. The following year, a wildfire in Greece claimed the lives of 104 individuals and destroyed more than 2,500 homes. In 2022, the EU saw 16,941 wildfires that burned a total of 785,553 hectares, with a staggering 110,000 hectares being affected in Portugal alone.

In addition to the Mediterranean region, other EU member states have also experienced significant wildfires. In 2019, wildfires in Sweden burned over 21,000 hectares of land, and wildfires in Germany burned over 2,000 hectares of land. While Central and Northern Europe have traditionally had lower wildfire risk, there is growing concern that these regions may also be at risk due to changing weather patterns and land use practices.

2022 was the second worst year in Europe in terms of burnt areas and the number of fires since 2006, according to the European Forest Fire Information System (EFFIS), with more than 830,000 hectares of burned land across Europe. These wildfires cost the EU 2.5 billion euros in economic damage and immeasurable cost of human lives and other losses.

To address the growing wildfire threat in Europe, the EU has established several initiatives to support member states in their efforts to reduce the risk of wildfires. The EU's Forest Fire Prevention and Management Directive requires member states to establish wildfire prevention and management systems. EFFIS provides real-time information on wildfires across Europe, including information on the location, size, and severity of wildfires. In

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addition, EU funding programs, such as the European Union Solidarity Fund, provide financial assistance to member states affected by natural disasters, including wildfires.

Many EU member states have also developed their own wildfire management policies and legislation. For example, Spain has established a network of fire management centers and implemented forest management practices, such as prescribed burning, to reduce the risk of wildfires. Portugal has established a national forest fire monitoring system and implemented measures to increase forest resilience to wildfire.

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2 Review of Policies

The management of wildfires has been the subject of numerous policy and legislation efforts at both the national and regional levels in Europe. This literature review provides a comprehensive analysis of the main strengths and weaknesses of these approaches, while also highlighting new directions in wildfire management strategies.

Montiel-Molina (2013) presents an assessment of fire legislation and policy documents, focusing on their contributions to integrated fire management. This work sets the stage for understanding the overarching structures guiding fire management efforts in Europe.

Recent communications from the European Commission indicate a new phase in natural disaster prevention and management, suggesting potential changes to future wildfire management strategies. Galiana et al. (2013) contribute to this discussion by assessing the effects of forest-related policies on wildland fires in the European Union, indicating that different policies have gradually been incorporated to address this complex issue.

Stephens et al. (2016) propose an emphasis on forest restoration as a critical priority in land management, arguing that large-scale restoration is essential for maintaining forest ecosystem integrity both now and into the future. This echoes the findings of several other studies, including works by Hix (2002), Schneider (2005), O'Brennan et al. (2007), and Mateus et al. (2014).

Looking towards future directions, Tedim et al. (2016) present an innovative wildfire management model, focusing on the territorial scale rather than individual communities or forests. Rodrigues et al. (2019) also offer a forward-thinking approach, using machine learning algorithms to model the initial success of wildfire suppression efforts in Catalonia, Spain.

Salis et al. (2020) discuss and share fire management policies, highlighting advanced strategies for reducing wildfire risk through joint action plans and pilot/demonstration actions. Meanwhile, Adame et al. (2020) forecast the carbon stored in the living biomass of Spanish forests under various forest management and wildfire scenarios, providing valuable insight into the potential impacts of these fires on carbon storage.

Finally, Spadoni et al. (2023) assess the effects of various potential fire drivers, including climate, weather, flammability, socio-economic descriptors, land use changes, and proxies for land governance, on fire-related impacts. This work utilizes Random Forest modelling and Generalized Additive Mixed Model, demonstrating the complex interactions that drive wildfire occurrence and severity.

Together, these works provide a comprehensive overview of European wildfire management policies, highlighting the complexities of this issue and suggesting potential avenues for future research and policy development.

The recent communications from the European Commission signalling a new phase in natural disaster prevention and management echo the proactive approach taken in the Cardiff process, a key initiative focused on European woodland fire management. The Cardiff process represents a significant turning point in European wildfire management policies. It emphasizes a holistic, integrated approach, aligning with the key themes identified in the reviewed literature, such as the focus on integrated fire management proposed by Montiel-Molina (2013), the importance of forest restoration as stressed by Stephens et al. (2016), and the innovative strategies for fire suppression, as demonstrated by Rodrigues et al. (2019). In fact, the Cardiff process and the works reviewed herein underscore the need for a multi-pronged, territory-wide strategy that

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considers a range of fire drivers, from climate and weather conditions to socioeconomic factors, land use changes, and governance policies. By correlating these key findings from the literature with the principles of the Cardiff process, a coherent picture of the evolution, current status, and future directions of European wildfire management emerge.

The work presented in this deliverable was largely influenced by the report published by the European Commission's Directorate-General for Research and Innovation titled "Forest Fires: Sparking firesmart policies in the EU." in 2018 as a “proposal for a decision”. The purpose of this report, edited by Nicolas Faivre, is to assess the EU's research on forest fires and examine how policies can be adapted to address the new challenges posed by larger and more destructive fires. These fires have overwhelmed during the last two decades the capabilities of many wildfire protection programs throughout Europe. According to the report, this trend is caused by unbalanced policies that can suppress wildfires effectively during normal weather conditions but are not enough to prevent extreme events during adverse conditions.

2.1 The Cardiff process

The Cardiff Process[1] was a series of meetings and discussions in the late 1990s and early 2000s among European Union member states to develop a common approach to managing forest fires.

The process was initiated in response to a series of devastating wildfires in Europe, particularly in the Mediterranean region, highlighting the need for better coordination and cooperation among countries to manage this natural hazard.

The Cardiff process resulted in the development a set of guidelines and recommendations for forest fire management, which were adopted by the European Union in 2004.

These guidelines emphasize the importance of prevention, preparedness, and response in managing forest fires and call for a coordinated approach among different levels of government and stakeholders.

The guidelines also recognize the need for a comprehensive and integrated approach to forest fire management, which considers ecological, social, and economic factors and involves various policy instruments and measures.

The Cardiff process proposed standardized forest fire management procedures, including fire prevention, suppression, and rehabilitation guidelines.

The Cardiff guidelines were aligned with the Forest Focus, a European Commission initiative from 2003 to 2012, aiming to improve the protection, management, and monitoring of forests in the European Union (EU). Furthermore, the procedures of the Cardiff process are included in the European Forest Fire Information System (EFFIS) guidelines and recommendations, which were adopted by the European Union in 2004. Here are some of the key procedures proposed:

[1] Commission working document - Integrating environmental considerations into other policy areas- a stocktaking of the Cardiff process /* COM/2004/0394 final */ (https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52004DC0394)

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- Fire prevention: The EFFIS guidelines recommend a range of measures to prevent forest fires, including creating firebreaks, reducing fuel loads through thinning and pruning, and implementing fire-safe land use practices. The guidelines also emphasize the importance of public education and awareness campaigns to help prevent accidental fires.
- Fire suppression: The guidelines propose a standardized approach to wildfire suppression, including the use of incident command systems, the establishment of fire lines, and the use of aerial and ground-based firefighting equipment. The guidelines also emphasize the importance of early detection and rapid response to prevent fires from spreading.
- Rehabilitation: The guidelines recommend a range of measures to rehabilitate forests following a wildfire, including reforestation, erosion control, and the restoration of damaged habitats. The guidelines also emphasize the importance of monitoring and evaluation to assess the effectiveness of rehabilitation efforts.

The guidelines and recommendations are collectively known as the European Forest Fire Information System (EFFIS), and are designed to improve forest fire management and prevention across Europe. EFFIS consists of several different components, including:

1. A forest fire database collects information on forest fires from across Europe and provides statistics on the number, size, and severity of forest fires.
2. A fire danger rating system to assess the risk of forest fires based on factors such as weather conditions, fuel moisture, and topography.
3. Early warning systems to provide real-time information on forest fires to help authorities respond quickly and effectively.
4. Standardized forest fire management procedures, including fire prevention, suppression, and rehabilitation guidelines.
5. Training and capacity-building programs to help develop the skills and knowledge of forest fire management professionals across Europe.

The EFFIS guidelines and recommendations have been adopted by EU member states and are used to guide forest fire management policies and practices across Europe. They are designed to help improve the effectiveness and efficiency of forest fire management, reduce the risk of forest fires, and enhance the resilience of forests to fire.

The Cardiff process also led to the development of several European policies related to forest fire management, including the EU Forest Strategy, which sets out a framework for sustainable forest management, and the EU Civil Protection Mechanism, which provides a framework for cooperation and coordination among EU member states in managing emergencies, including forest fires.

Using the Cardiff process as a reference point, the document positions its analysis within a broader European context. The reference to this process suggests that the deliverable draws on the respective guidelines and recommendations to assess the effectiveness of national and regional wildfire legislation and policies in Europe. It highlights the importance of a coordinated and integrated approach to forest fire management across the E.U. countries and regions.

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2.2 European policies

To fully understand the protection of European forests against fires, we first considered the policies established over many decades through legislation and regulations. This is a crucial part of the European acquis. Landscape fires are becoming a bigger concern in Europe, not only in the South of the E.U. but also in the Central and Northern countries due to the impact of climate change. Due to the EU and national policies aiming to exclude wildfire from the natural ecosystem processes, which is to a certain extent reasonable to protect human activity, some countries have decreased the number of fires and burned areas since the 1980s. Unfortunately, this has turned out over time to be an occasional achievement since larger and more destructive fires occurred because of this aggressive wildfire management strategy. This is putting a strain on many wildfire protection programs across Europe, as the current policies are not equipped to handle extreme events, and even more, they are not oriented to avoid creating conditions that will favour such situations in the future. A more balanced and holistic approach is needed to effectively prevent and suppress these fires.

A significant policy initiative of the E.C. was "Forest Focus"[2], a program running for ten years between 2003 and 2012, which really focused to the holistic management of the European forests. The Forest Focus Directive, implemented through the above-mentioned regulations and consolidated texts, aimed to address the challenges of forest fire management in the European Union. The directive required member states to monitor their forest ecosystems, report on the state of their forests, and assess the impact of air pollution and climate change on their forests. It also supported sustainable forest management practices, provided guidelines and best practices for forest management, and promoted research and innovation in the field of forest monitoring and management.

Through the establishment of a coordinated approach to monitoring forest ecosystems, the directive aimed to improve the protection, management, and monitoring of forests in the EU. Its focus on sustainable forest management practices and the promotion of research and innovation in the field also aimed to address the challenges of forest fire management. While the Forest Focus Directive is no longer in force, many of its objectives and principles have been carried forward in subsequent EU policies and initiatives, such as the EU Forest Strategy and the EU's commitments under the Paris Agreement on climate change.

The diagram below depicts the fundamental stages of progression in the wildfire management policies implemented by the European Commission during the preceding two decades.

- [2] European Commission. (2003). Forest Focus - Council Regulation (EC) No 2152/2003. Official Journal of the European Union, L 324/1. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32003R2152
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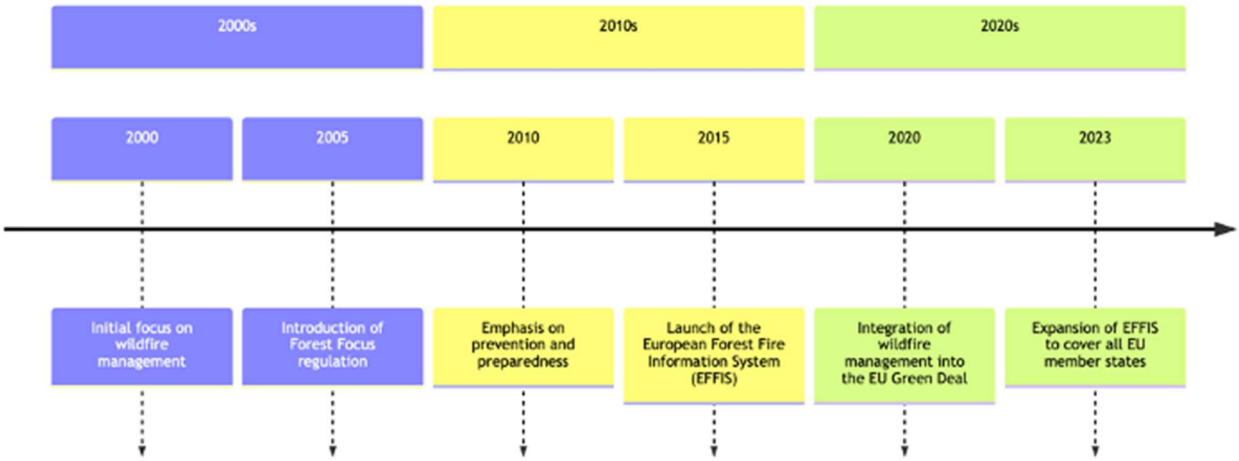


Figure 1. Evolution of European Commission's wildfire management policies

There are several relevant policy challenges that the EU should address at present, including:

- Informed and improved science-based forest fire management and decision-making

Managing forest fires is a major challenge for policymakers. To effectively address this issue, science-based information is necessary. Policymakers must depend on scientific research to make informed decisions on preventing and responding to forest fires.

- Adapting to the needs and requirements of the new wildfire context caused by climate change

The nature of forest fires is evolving, and it is important to improve prevention and preparedness measures. Climate change is causing more frequent and intense forest fires, and policymakers should take a proactive approach to forest fire management.

- Improved coordination among the operational actors in the context of integrated wildfire management

Effective forest fire management requires coordination between all services and stakeholders involved in the forest fire management cycle. This entails different agencies and organizations working together under standardized and common plans to ensure that resources are deployed efficiently and effectively in response to forest fires, particularly in cross-border events.

- Enhanced governance and learning on how-to live-in fire-prone areas

Living in fire-prone areas requires adequate governance, so policymakers need to develop policies and regulations that help people live safely in these areas. This might include zoning regulations, building codes, and other measures that help to reduce the risk of forest fires.

- Improved landscape, forest and communities' resilience to forest fires

Landscapes and communities need to become more resilient to forest fires. This means that policymakers need to focus on measures that help reduce forest fires' impact on people and the environment. This might include creating fire breaks, improving forest management practices, and developing early warning systems.

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The EU has implemented various measures to mitigate and prevent forest fires, such as the EU Forest Strategy[3], which aims to promote sustainable forest management and reduce the risk of forest fires. The Common Agricultural Policy (CAP)[4] and the European Agricultural Fund for Rural Development (EAFRD) also support measures to prevent forest fires by promoting sustainable land use practices[5].

Furthermore, the EU has established the European Forest Fire Information System (EFFIS) to provide fire weather forecasts and other information related to forest fires and help in preparedness by providing decision-makers early warning and situational awareness[6].

The Disaster Risk Management Knowledge Center (DRMKC) has developed a Risk Data Hub to provide access to data related to disaster risks[7]. This hub helps decision-makers to assess the risks associated with forest fires and take appropriate measures to mitigate them. The EU Exchange of Experts program[8] also facilitates the exchange of knowledge and expertise among experts involved in forest fire management.

The EU's Civil Protection Mechanism (UCPM)[9] and Emergency Response Coordination Centre (ERCC)[10] are crucial in responding to forest fires. These mechanisms provide a coordinated response to emergencies and ensure that resources are deployed effectively to manage forest fires.

The EU has also established the European Natural Hazard Scientific Partnership – ARISTOTLE project[11] to improve the understanding of natural hazards, including forest fires. This project aims to develop new tools and methods to assess the risks associated with forest fires and support decision-making.

The Disaster Risk Management Knowledge Center (DRMKC) has developed the Disaster Damages and Loss Data system to provide information on the impacts of disasters, including forest fires. This system helps decision-makers to assess the economic and social impacts of forest fires and take appropriate measures to restore and adapt affected areas.

The EU Solidarity Fund[12] and Cohesion Policy Regional Programmes[13] financially support member states affected by forest fires. These funds help restore and adapt affected areas and support the recovery of affected communities.

[3] https://ec.europa.eu/info/food-farming-fisheries/forestry/eu-forest-strategy_en
[4] https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy_en
[5] https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/rural-development_en
[6] https://effis.jrc.ec.europa.eu/
[7] https://drmkc.jrc.ec.europa.eu/risk-data-hub
[8] https://ec.europa.eu/echo/what/civil-protection/exchange-experts_en
[9] https://ec.europa.eu/echo/what/civil-protection/civil-protection-mechanism_en
[10] https://ec.europa.eu/echo/what/civil-protection/emergency-response-coordination-centre-ercc_en
[11] https://www.egu.eu/news/491/european-natural-hazard-scientific-partnership-aristotle-project/
[12] https://ec.europa.eu/regional_policy/en/policy/what/solidarity-fund/
[13] https://ec.europa.eu/regional_policy/en/policy/what/regional-programmes/

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Based on the above information, it is evident that the EU has taken a comprehensive approach to tackling the threat of forest fires, from implementing policies and defining strategies to promote sustainable land use to supporting disaster management with financial aid. Through the aforementioned projects and policies, the EU is working to mitigate the impacts of forest fires and improve preparedness and response mechanisms. In addition, the EU Solidarity Fund and Cohesion Policy Regional Programmes provide financial support to countries affected by forest fires.

Furthermore, international policies that the E.C. has endorsed are related to wildfire management such as the Sendai Framework, an UN-initiated international agreement aiming at reducing disaster risks caused by natural hazards through a multi-hazard approach. The Sendai Framework has four main priorities i.e., Understanding disaster risk, Strengthening disaster risk governance, Investing in disaster risk reduction for resilient development, and Enhancing disaster preparedness for effective response and to "Build Back Better" in recovery, rehabilitation, and reconstruction. This framework is aligned with other international agreements such as the Paris Agreement on climate change, the 2030 Agenda for Sustainable Development, and the Addis Ababa Action Agenda on financing for development. The framework includes policy aspects related to wildfires and has led to the issuance of national risk reduction policies in several countries. Sendai Policy aspects related to wildfires include Early warning systems, Improved land use & forest management practices, Community engagement, and Climate change adaptation.

2.3 Survey & conclusions on National wildfire management policies

Apart from the European and International policies and initiatives to cope with wildfire challenges, it's crucial to consider relevant national policies that address local and regional issues. As part of the FirEUrisk project, an analysis was conducted to review wildfire management policies in various European countries.

The methodology used to gather information and analyze it is arranged in three steps:

- The first step was to review legal and policy documents and references related to wildfire policies in the EU and the various E.U. member states. This helped to understand the current state of affairs and identify gaps or areas needing further investigation.
- The second step involved collecting information from consortium partners through proper questionnaires designed to gather policy and legislative-related information concerning wildfire management. These were sent to partners in different regions or countries. The feedback gathered through the questionnaires can be interpreted quantitatively and qualitatively, analyzing the written responses.
- The third step is to study and analyse this information against relevant case studies at the national and regional level, which is a work in progress to be reported in D6.15 (M48). This will help to understand how similar issues have been addressed in different contexts and identify best practices or lessons learned that can be reported in D6.15. The analysis will be qualitative and quantitative, meaning that the researchers will look at the specific details of each case study and the broader trends that emerge from them.

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Four different factors that play a key role in managing wildfires are considered in the survey. These factors refer to organizations, legislation, policies, and investments.

- Organizations are responsible for managing wildfires and can include government agencies, local and regional authorities, and non-governmental organizations. The authority level of these organizations indicates the level of government or other authority they report to, such as local, regional, or national.
- Legislation plays a crucial role in wildfire management, covering prevention, suppression, and recovery. Different regions and countries have their own laws that focus on different stages of wildfire management. With this in mind, we propose a comprehensive strategy that takes into account the existing legislation and aims to improve wildfire management practices.
- Policies are an essential component of wildfire management. They serve as the guiding principles and guidelines for prevention, suppression, and recovery efforts. These policies hold the same authority and jurisdiction as legislation, and they are crucial in ensuring effective management at every stage of the process. By following these policies, we can better protect our communities and natural resources from the devastating effects of wildfires.

Investments in wildfire management are financial resources allocated to prevention, suppression, and recovery efforts. The level of authority and jurisdiction of these investments may vary depending on the funding source, and they are focused on specific stages of wildfire management. The distribution of investments across different stages of wildfire management indicates how well-integrated the overall strategy is.

Based on the analysis of the feedback gathered through the national/regional questionnaires, some conclusions were drawn, comparing the forest and fire service management approach in Northern and Southern European Union (EU) countries. The forest and fire service management approach refers to the strategies and methods used to prevent, manage, and respond to forest fires and other natural hazards that may occur in forests. These conclusions are as follows:

- Northern EU countries, such as Sweden and Finland, have a forest management approach that focuses on preventing forest fires by implementing strict regulations on forest use, conducting regular forest inspections, and investing in forest fire prevention technologies. They also have a well-organized fire service that responds quickly to forest fires and has the necessary equipment and resources to manage them effectively, but they do not have great experience in dealing with very large fires.
- In contrast, Southern EU countries, such as Greece and Portugal, have a fire service management approach that focuses on responding to forest fires rather than preventing them. They have a decentralized organization, with regional or federal authorities responsible for managing forest fires. This approach often leads to delays in response time and inadequate resources to manage large-scale forest fires.
- The centralized vs regional/federal organization refers to how forest and fire service management is organized in Northern and Southern EU countries. In Northern EU countries, forest and fire service management is centralized, with a national authority responsible for managing forest fires. In contrast, Southern EU countries, excluding Portugal, have a regional or federal organization, with different authorities responsible for managing forest fires in different regions or states.

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The differences in forest and fire service management approaches and organization between Northern and Southern EU countries can have significant implications for the prevention and management of forest fires. Understanding these differences can help policymakers and stakeholders develop more effective strategies to prevent and manage forest fires in the EU.

In terms of legislation on wildfire management at the national and regional level the information gathered through the FirEUrisk survey has shown different approaches taken by countries with high and low wildfire risks regarding regulations and requirements for wildfire prevention. Thus:

- In countries with a high risk of wildfires, such as Portugal, Spain, and Greece, there are more extensive regulations and requirements for wildfire prevention. These include restrictions on outdoor burning, bans on certain activities during periods of high fire risk, and mandatory evacuation plans for at-risk communities. This approach is referred to as a fire-centered and law-enforcing approach. This approach is adopted because these countries have experienced devastating wildfires in the past, resulting in loss of life, property damage, and environmental destruction. Therefore, they have implemented strict regulations to prevent such disasters from happening again.
- On the other hand, in countries with lower wildfire risk, such as Denmark, Sweden, and the Netherlands, regulations are less extensive. Instead, the focus is on general forest management practices, education, and awareness campaigns to promote responsible behaviour. This approach is referred to as a forest-centered and human-factor-inclusive approach. This is because these countries have not experienced wildfires with devastating results as in the southern countries. Therefore, they focus more on sustainable forest management practices and educating the public on responsible behaviour to prevent wildfires from occurring in the first place.

Both approaches have their advantages and disadvantages. The fire-centered and law-enforcing approach is closer to integrated wildfire management. It may be more effective in preventing wildfires in high-risk areas but also be more restrictive and costly. The forest-centered and human-factor-inclusive approach is closer to the holistic approach to wildfire management. It may be more sustainable and cost-effective, but it may not be as effective in preventing wildfires in high-risk areas.

Analyzing the feedback received, we can classify the regional wildfire management policies in the EU into five regions:

1. Southern Europe,
2. Eastern Europe,
3. Central Europe,
4. North-West (Atlantic) Europe, and
5. Northern Europe.

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The classification is important because it helps to understand the diversity and complexity of laws and regulations related to wildfire prevention in EU member states. The laws and regulations reflect each country's unique challenges, priorities, and culture, which vary based on geographical location. For instance, Southern European countries may face different wildfire challenges compared to those in Northern Europe due to climate, vegetation, and topography differences. Despite the diversity, many member states have adopted similar measures and best practices for wildfire prevention. These measures are mainly based on technological capabilities such as early warning systems, firefighting equipment, and public education and awareness campaigns. Adopting similar measures and best practices is important because it helps improve the effectiveness of wildfire prevention efforts across different regions and countries. However, it is also important to recognize each country and region's unique challenges and priorities to understand that the measures and best practices are tailored to their specific needs.

2.4 Wildfire management policies in Portugal

2.4.1 General status

Portugal has one of the highest forest fire risk rankings in Europe. Fire researchers all point to the same combination of contributing factors: shifting demographics with the population moving from rural to urban areas; the land use with more agricultural and forested areas left unattended and not being maintained; the fragmentation of land ownership patterns that discourage investment in forest management and fire planning; the proliferation of the large areas of eucalyptus trees, even in agricultural land, which are mostly unmanaged and the climatic change.

The trend of annual burned area for the last four decades confirms a new level of fire activity in Portugal, despite increased investment in the number of firefighting assets.
A much greater range in burning conditions can be expected into the future, as demonstrated by the wide variation in climate and weather episodes experienced in Portugal over the last two decades. Some years experienced an extended period of higher severity burning conditions, often adding additional weeks on both the front and back ends of the traditional July through September peak fire season. Other years experienced cooler, moister summers. These years with very low annual burned areas have led to prematurely declaring success because of increased aerial firefighting assets, new policies, and organizational reforms. History has now proven otherwise. The changes made were not sufficient to significantly alter the outcome during the hot, dry extended summer of the catastrophic 2017 fire year. Severe drought, heat waves, massive oceans of flammable forests and scrublands, and a weather phenomenon – Hurricane Ophelia in mid-October - came together in a “perfect storm” situation. All that was needed was the ignition, and Portugal had 523 reported fire occurrences on October 15, 2017. Together with Pedrógão Grande fire on June 17th, Portugal, both fires caused the loss of 118 lives.

Why has Portugal found itself in this profoundly undesirable situation? The answers are basically the same today as they were evident a decade ago: (1) the growing percentage of forest lands that are unmanaged; (2)

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the increase in fuel loads, both in amount and extent; (3) the high number of unwanted fire ignitions during moderate to severe burning conditions, in spite of the reduction that the number of ignitions had during the last decade; and (4) climate change and increasing periods of hot and dry weather that both lengthen and increase the severity of critical periods for extreme fire. The result is summarized in four major areas needing improvement, which have been made evident in several past relevant reports; –(1) preventing unplanned human ignitions and reinforcing the protection of the communities, (2) creating a structural fire prevention system of land management and fuel breaks, namely by reducing fuel load in critical areas, (3) improving firefighting capability by implementing perimeter control tactics and large fire management strategies and, (4) restructuring Portugal's fire organization.

A summary of the main policy lines in Portugal follows:

- Launching of a community protection program called "Safe Villages/ Safe Citizens" in the high-risk areas to promote the sensibilization of the citizens and prepare them to face situations of very large fires to avoid last-minute escape attempts that may cause entrapments.
- Prevention measures: The Portuguese government has implemented various prevention measures, such as promoting forest management and reforestation, developing early warning and decision-making support systems, and establishing regulations for controlled burning. A great effort was made to enforce fuel management around the houses and the settlements. The government also runs a program called "Clean and Safe Forests" to reduce the risk of wildfires and improve forest health.
- Response and management: The Portuguese firefighting services are coordinated by the National Authority for Emergency and Civil Protection (ANEPC), which oversees the work of the local fire services, being mostly voluntary firefighters but there are also other relevant forces, namely FEPC (Special firefighter force) and UEPS-GNR (National Guard emergency teams). The ANEPC also has a national plan for forest fire prevention, which outlines the roles and responsibilities of various agencies and provides guidance on the response to large-scale wildfires.
- Technology and innovation: In recent years, Portugal has invested in new technologies and innovations to improve its wildfire management. For example, the government has developed a system that uses satellites to detect wildfires in real-time, and has invested in firefighting drones and other equipment. During three successive years a 15 million euros research program was launched through the National Science and Technology Foundation, that financed more than forty research projects and mobilized more than one thousand researchers from various areas and backgrounds. Forest fire management policy in Portugal is the responsibility of multiple organizations, including the Portuguese government, the Ministry of Internal Administration, the National Authority for Civil Protection, the Institute for Nature Conservation and Forests (ICNF), and the Portuguese Association of Forest Owners. ICNF is responsible for wildfire prevention and assessing the risk at the national level. They manage prevention by promoting forest management and reforestation, establishing regulations for controlled burning, and overseeing the use of prescribed fire, which is regulated by law. They introduced a new platform to register all citizen-requested controlled burnings, which

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are only allowed if the meteorology conditions are favourable. This measure contributed to reducing the number of unwanted fires and fire escapes.
The National Guard operates a network of surveillance towers and cameras for early warning and manages a complementary network of fire detection technology promoted by local and regional authorities and forest owners as well.
The Portuguese government implemented a reform in its wildfire management organization after the destructive wildfires of 2017. This reform led to the establishment of the Agency for Integrated Rural Fire Management (AGIF) in 2018, which operates as a public agency under the Prime Ministry and is headquartered in Lousã, the center region of Portugal. AGIF's primary responsibility is to devise and execute a national strategy for integrated rural fire management in Portugal. AGIF collaborates with numerous agencies and stakeholders involved in wildfire management, including the National Authority for Emergency and Civil Protection (ANEPC), the Portuguese Institute for Nature Conservation and Forests (ICNF), and The Portuguese Institute for Sea and Atmosphere, I. P. (IPMA, IP). The implementation of this strategy is still ongoing.
Recent climate studies have disclosed disconcerting forecasts for Portugal similar to other EU member states in Southern Europe. The escalation in temperatures and reduction in precipitation have become habitual and present no indications of subsiding in the near future. The latest report from the EC/JRC anticipates that the situation will deteriorate, particularly in the Iberian Peninsula. These alterations in climate and weather are expected to intensify the strain on vegetation, leading to more severe and devastating wildfires.

2.4.2 FirEUrisk survey on Wildfire Management Policies (Portugal)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.
Wildfire Management Policies in Portugal

Portugal's wildfire management policies are governed by various organizations and laws, with a focus on prevention, response, and restoration. The recent Decree-Law n.º 82/2021, effective from 1st January 2021, establishes the new integrated system of rural fires.

Organizations Involved in Wildfire Management

1. *Agência para a Gestão Integrada de Fogos Rurais (AGIF)*: This agency, under the Prime Minister, coordinates and defines strategies related to prevention and compiles and analyses damage and costs of operations.
2. *Instituto da Conservação da Natureza e das Florestas (ICNF)*: Under the Ministry of the Environment and Climate Action, this institute plays a robust role in prevention and recovery interventions, focused on forests. It also maintains a force for suppressing fire in rural territories.
3. *Autoridade Nacional de Emergência e Proteção Civil (ANEPC)*: This national authority coordinates fire protection actions, commands suppression and rescue operations, and supports local authorities in identifying shelters and evacuation routes.
4. *Guarda Nacional Republicana (GNR)*: This national guard works on inspection of fuel management, the use of fire, and access conditioning. It is in charge of fire detection, initial firefighting and ensures also

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the opening ways for the circulation of rescue forces and supports the evacuation of populations and animals in danger.

5. *Polícia de Segurança Pública (PSP)*: Similar to GNR, PSP works on inspection of fuel management, the use of fire, and access conditioning in urban areas. It also ensures the opening ways for the circulation of rescue forces and supports the evacuation of populations and animals in danger.
6. *Polícia Judiciária (PJ)*: Under the Ministry of Justice, PJ works mainly in the investigation of the causes of fires and forest fire crimes.
7. *Forças Armadas (Armed forces)*: They collaborate in the maintenance of fuel management zones, support the logistics of civil protection operations, the evacuation of populations, and act in the response to fires through the ~~air~~ Air ~~force~~Force. The Air Force operates a squadron of drones to survey the territory to monitor fire ignitions and is in charge of managing all the aerial means, although the majority of them are owned and operated by private entities
8. *Instituto Português do Mar e da Atmosfera (IPMA)*: This institute ensures real-time meteorological information for risk analysis.
9. *Direção-Geral do Território (DGT)*: DGT systematises cartographic information and promotes the preparation of programmes for the reordering and management of the landscape.
10. *Direções Regionais de Agricultura e Pescas*: They promote silvopastoral actions and its valorisation as an economic activity.
11. *Direção-Geral de Alimentação e Veterinária (DGAV)*: DGAV defines animal evacuation strategies and promotes good practices in the use of fire for phytosanitary control.
12. *Autarquias Locais, ~~sobretudo~~ mainly Municípios (Municipalities)*: Local authorities have tasks related to regulating fuel management, issuing warnings to populations, planning emergency solutions for the rescue and evacuation of populations, and supporting the return to pre-fire conditions. Municipalities are also in charge of providing logistic support to fire suppression agencies.
13. *Comissões de Coordenação e Desenvolvimento Regional (CCDR)*: They participate in the planning and identification of funding sources and provide technical support to local authorities.
14. *Corpos de Bombeiros (~~Fireman~~ Firefighter ~~corps~~Corporations)*: They conduct fire suppression activities and support preventive burning. The firefighters are mainly volunteers but an increasing number of Commanders and Chiefs are becoming professionals. Their training is assured by a National Firefighting School.
15. Scientific Community: Besides the research program launched by the National Science Foundation the scientific community was involved in a Collaborative program called Forestwise and in a National Observatory created by the Parliament from 2018 to 2020 to assess the authorities in the assessment of legislation and activities related to wildfires. In 2022 the Government created a Scientific Panel to analyse the fires that occurred in that year.

Key Laws and Policies

1. *Decree-Law N.º 130/2017*: This law provides an exceptional regime of prior control for the reconstruction of buildings destroyed or seriously damaged by disasters.

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2. *Decree-Law N.º 124/2006*: This law establishes the Defence System of Forests against Fires.

Based on the information provided and additional resources, here is an extensive report on wildfire management policies in Portugal:

Portugal has a comprehensive system for managing wildfires, with a focus on prevention, response, and restoration. This system is governed by Decree-Law n.º 82/2021, which establishes the new integrated system of rural fires and generally applies from 1st January 2021 onwards.

Several organizations play a key role in this system:

1. **Agência para a Gestão Integrada de Fogos Rurais (AGIF)**: This agency, under the Prime Minister, has strategic competencies of coordination and definition of strategies related to prevention. It also compiles and ~~analyzes~~analyses damage and costs of operations.
2. **Instituto da Conservação da Natureza e das Florestas (ICNF)**: Under the Ministry of the Environment and Climate Action, this institute has a robust role in prevention and recovery interventions, focused on forests, natural areas and in particular on the soil conservation. It also maintains a force for suppressing fire in rural territories.
3. **Autoridade Nacional de Emergência e Proteção Civil (ANEPC)**: This national authority coordinates fire protection actions, commands suppression and rescue operations, and supports local authorities and citizens in identifying shelters and evacuation routes.
4. **Guarda Nacional Republicana (GNR)**: The GNR works on inspection of fuel management, the use of fire, and access conditioning. In response to fires, it ensures the opening of ways for the circulation of rescue forces and supports the evacuation of populations and animals in danger.
5. **Polícia de Segurança Pública (PSP)**: Similar to the GNR, the PSP also works on inspection of fuel management and the use of fire. It supports the evacuation of populations and animals in danger during fires.
6. **Polícia Judiciária (PJ)**: The PJ mainly investigates the causes of fires and forest fire crimes.
7. **Forças Armadas (Armed forces)**: The Armed forces collaborate in the maintenance of fuel management zones, support the logistics of civil protection operations, the evacuation of populations, and act in the response to fires through the air force.
8. **Instituto Português do Mar e da Atmosfera (IPMA)**: The IPMA ensures real-time meteorological information for risk analysis.
9. **Direção-Geral do Território (DGT)**: The DGT systematizes cartographic information and promotes the preparation of programs for the reordering and management of the landscape.
10. **Direções Regionais de Agricultura e Pescas (DRAP)**: The DRAP promotes silvopastoral actions and its valorization as an economic activity.
11. **Direção-Geral de Alimentação e Veterinária (DGAV)**: The DGAV defines animal evacuation strategies and promotes good practices in the use of fire for phytosanitary control.
12. **Autarquias Locais, sobretudo Municípios (Municipalities)**: Local authorities have tasks related to regulating fuel management, issuing warnings to populations, planning emergency solutions for the rescue and evacuation of populations, and supporting the return to pre-fire conditions.

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13. **Comissões de Coordenação e Desenvolvimento Regional (CCDR)**: The CCDR participates in the planning and identification of funding sources and provides technical support to local authorities.
14. **Corpos de Bombeiros (Fireman corps)**: The Fireman corps conducts fire suppression activities and supports preventive burning.

In addition to these organizations, several laws and decrees guide the wildfire management policies in Portugal. For instance, Decree-Law N.º 130/2017 provides an exceptional regime of prior control for the reconstruction of buildings destroyed or seriously damaged by disasters. Decree-Law N.º 124/2006 establishes the Defence System of Forests against Fires.

Investments are also made to support wildfire management. For example, Fundação Gulbenkian and *Efanor Investimentos* have funded a project worth 31 million euros to reduce fuel through active forest management, contributing to the prevention of forest fires. The European Structural & Investment Fund supports the RePLANt project, which aims to develop integrated and innovative solutions for the sustainable management of Portuguese forests. The Ministry of Environment and Climate Action has also supported investment in forestry in 2020 with €100 million, channelled into five bidding areas, complemented with 45 million Euro from the Environmental fund.

In conclusion, Portugal's wildfire management policies are comprehensive and involve various organizations at the national, regional, and local levels. These policies are guided by laws and decrees and are supported by significant investments. The focus is on prevention, response, and restoration, with an emphasis on integrated management of rural fires.

2.5 Wildfire management policies in SPAIN

Spain's forest fire management policy is proactive and collaborative, focusing on prevention and rapid response. Given the political and administrative organization of Spain in a National level and 17 Autonomic Communities, the wildfire management policy is organized at these two levels as well. The Ministry of Ecological Transition and the Demographic Challenge is the national authority in Spain responsible for overseeing and coordinating wildfire management. Spain has a national agency, the Spanish Forest Fire Fighting Service (BRIF), dedicated to fighting forest fires. BRIF was established in 1989 and is part of the Ministry of Ecological Transition and Demographic Challenge. It is composed of 13 fire brigades, each consisting of around 90 highly trained firefighters who are equipped with specialized equipment and vehicles designed to respond to wildfires in remote and difficult-to-reach areas. The agency is also responsible for conducting fire prevention activities, including the establishment of firebreaks and the reduction of fuel loads in high-risk areas. BRIF works closely with other agencies and organizations involved in wildfire management in Spain, including regional firefighting services, the Civil Protection service, and the Spanish Military Emergency Unit. The firefighting services in Spain are coordinated by the Ministry of Agriculture, Fisheries and Food, which oversees the work of the autonomous regions.

At the national level, the main legislation governing wildfire management in Spain is the Forest Fire Prevention and Suppression Law (*Ley de Prevención y Lucha contra los Incendios Forestales*), which was updated in 2015. This law sets out the principles and measures for preventing and fighting forest fires, and establishes the

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responsibilities of different actors involved in wildfire management, including the central government, the autonomous regions, municipalities, landowners, and citizens. The law requires the establishment of fire prevention plans, which must be updated every five years, and sets out the requirements for fire suppression equipment and the training of firefighting personnel. It also establishes penalties for non-compliance with fire prevention measures and for causing wildfires.

At the regional level, each autonomous region of Spain has its own legislation and policies for wildfire management, which must comply with the national legislation. These regional laws establish the specific measures and responsibilities for preventing and fighting forest fires in each region, considering the local climate, terrain, and vegetation types. The 17 Spanish autonomies have their own firefighting and civil protection services responsible for managing and responding to wildfires within their territories. For example, Catalonia has a regional fire and rescue service, the *Bombers de la Generalitat de Catalunya* (CFS), under the Catalan Ministry of Home Affairs.

Andalusia has a Regional wildfire management frame known as the Plan INFOCA. The plan is managed by the Andalusian Government's Ministry of Agriculture, Livestock, Fisheries, and Sustainable Development. INFOCA is designed to respond to the specific wildfire risks and characteristics of the Andalusia region, Spain's largest and most populous region. The plan is implemented annually during the wildfire season, typically from June to October. The objectives of the Plan INFOCA are to prevent and minimize the number and impact of wildfires in the region, protect human life and property, and maintain the ecological and economic value of the forests and other natural areas. The Plan INFOCA involves a range of measures, including the establishment of firebreaks and fuel management zones, the provision of firefighting personnel and equipment, and the development of early warning systems and fire detection technologies. The plan also involves extensive public outreach and education efforts, increasing public awareness of the risks and impacts of wildfires and promoting responsible behaviour among residents and visitors to the region.

~~Similarly~~Similarly, the region of Catalonia has its own Forest Fire Prevention and Suppression Law (*Llei de prevenció i lluita contra els incendis forestals*), which establishes the principles and measures for preventing and fighting forest fires in the region. The law requires establishing fire prevention plans and sets out the responsibilities of different actors involved in wildfire management, including the regional government, municipalities, landowners, and citizens.

Other autonomous regions, such as Galicia, Castilla y Leon and Valencia, also have their own legislation and policies for wildfire management, which vary depending on the specific characteristics of each region.

Municipal fire brigades and civil protection services also play an important role in wildfire management, particularly in urban and peri-urban areas where wildfires pose a significant risk to communities.

Spain invests in research, technology, and innovation to improve its wildfire management. Fire science and technology are integrated and supported through these policies. This can be linked to several large "Spanish" ICT and Innovation companies providing relevant solutions.

2.5.1 FirEUrisk survey on Wildfire Management Policies (Spain)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildfire Management Policies in Spain

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Spain has a comprehensive set of policies and organizations in place to manage wildfires. These policies are implemented at the national level and involve prevention, response, and restoration measures.

Organizations Involved in Wildfire Management

1. **Ministerio de Agricultura, Pesca y Alimentación**: This is the Ministry of Agriculture, Fisheries, and Food. While the specific roles in wildfire management are not specified, it is a national-level organization involved in the process.
2. **Comisión estatal para el patrimonio natural y la biodiversidad**: This is the State Commission for Natural Heritage and Biodiversity, which falls under the Ministry of Ecological Transition and the Demographic Challenge. It is involved in the prevention of wildfires at the national level. More Information
3. **Comité de Lucha contra los Incendios Forestales**: This is the Committee for the Fight Against Forest Fires, also under the Ministry of Ecological Transition and the Demographic Challenge. It is involved in both the prevention and response to wildfires at the national level. More Information

Laws and Decrees

Several laws and decrees guide the wildfire management policies in Spain. These include:

1. **Ley 43/2003, de 21 de noviembre, de Montes**: This is the Law of Forests and natural areas, which includes sections related to fire. It is applied by National Administrations and Autonomic Communities and covers prevention, response, and restoration. The law has been modified over the years, but the current version can be accessed here.
2. **Ley 21/2015, de 20 de julio, por la que se modifica la Ley 43/2003, de 21 de noviembre, de Montes**: This law modifies Law 43/2003 and is also applied by National Administrations and Autonomic Communities. It covers prevention, response, and restoration. The law can be accessed here.
3. **Ley 10/2006, de 28 de abril, por la que se modifica la Ley 43/2003, de 21 de noviembre, de Montes**: This law also modifies Law 43/2003 and is applied by National Administrations and Autonomic Communities. It covers prevention, response, and restoration. The law can be accessed here.
4. **Ley Orgánica 10/1995, de 23 de noviembre, del Código Penal**: This is the Criminal Law, which details arson crimes in Chapter II, Articles 351 to 358bis. It can be accessed here.
5. **Ley 17/2015, de 9 de julio, del Sistema Nacional de Protección Civil**: This is the General Law for the National Civil Protection System, which includes response to wildfires.
6. 6. **Real Decreto 893/2013, de 15 de noviembre, por el que se aprueba la Directriz básica de planificación de protección civil de emergencia por incendios forestales**: This decree approves the Basic guidelines for the planning of civil protection of emergencies due to forest fires. It is applied by National Administrations and Autonomic Communities. The decree can be accessed here.
7. **Real Decreto 734/2019, de 20 de diciembre, *por el que se modifican directrices básicas de planificación de protección civil y planes estatales de protección civil para la mejora de la atención a las personas con discapacidad y a otros colectivos en situación de especial vulnerabilidad ante emergencias***: This decree modifies the Real Decreto 893/2013 to improve the handling of vulnerable

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persons during emergencies. The article dealing with fire emergencies is Article 6. It is applied by National Administrations and Autonomic Communities. The decree can be accessed here.

8. **Resolución de 31 de octubre de 2014, de la Subsecretaría, *por la que se publica el Acuerdo del Consejo de Ministros de 24 de octubre de 2014, por el que se aprueba el Plan Estatal de Protección Civil para Emergencias por Incendios Forestales***: This resolution approves the National Plan of civil protection for emergencies due to forest fires. It is applied by National Administrations and Autonomic Communities. The resolution can be accessed here.
9. **Orden PCI/1283/2019, de 27 de diciembre, *por la que se publica el Acuerdo del Consejo de Ministros de 20 de diciembre de 2019, por el que se modifican directrices básicas de planificación de protección civil y planes estatales de protección civil para la mejora de la atención a las personas con discapacidad y a otros colectivos en situación de especial vulnerabilidad ante emergencias***: This order modifies the Real Decreto 893/2013 to improve the handling of vulnerable persons during emergencies. The article dealing with fire emergencies is Article 7. It is applied by National Administrations and Autonomic Communities. The order can be accessed here.
10. **Decreto 3769/1972, de 23 de diciembre, por el que se aprueba el Reglamento de la Ley 81/1968, de 5 de diciembre, sobre Incendios Forestales**: This decree regulates the Law 81/1968 of Forest Fires, which has been abolished by Law 43/2003, but some of its clauses remain active. The decree can be accessed here.

Policies

1. **Forest Policy**: The Ministry of Ecological Transition and the Demographic Challenge has released strategic guidelines for the forest fire management in Spain. These guidelines cover prevention and response, but are exclusive to restoration. The guidelines can be accessed here.
2. **Technical Recommendations for the Management of Controlled and Prescribed Fires**: This policy, also from the Ministry of Ecological Transition and the Demographic Challenge, provides technical recommendations for the management of controlled and prescribed fires. It is inclusive in prevention but exclusive in response and restoration. The policy can be accessed here.
3. **National Civil Protection Plan for Emergencies Due to Forest Fires**: This policy, implemented by the Ministry of the Interior, is exclusive in prevention but inclusive in response. It does not cover restoration. The policy can be accessed here.

Investments

While the table does not provide specific details on investments related to wildfire management, it is clear that Spain has a robust system in place to manage wildfires. This system involves various ministries and covers prevention, response, and restoration efforts at the national level. The policies and laws in place are comprehensive and are regularly updated to ensure effective wildfire management.

In conclusion, Spain's wildfire management policies are comprehensive, involving multiple organizations and laws. They cover all aspects of wildfire management, from prevention to response and restoration. These

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policies are regularly updated to ensure their effectiveness and to address emerging challenges in wildfire management.

2.6 Wildfire management policies in FRANCE

2.6.1 General status

Forest fire management policies in France are regulated by three primary national codes: the Forest Code, the Environment Code, and the General Code of Territorial Authorities (CGCT).

The regulations governing the management, protection, and utilization of forests in France are specified in the Forest Code. The roles and responsibilities of the parties involved in forest management, including the French National Forestry Office (ONF) for state-owned forests and private forest owners for their own forests, are defined in this code.

The forest code comprises crucial regulations, including:

- A mapping of the forests prone to a fire risk and, within this area, the obligation to clear brush in a radius of 50 meters around buildings
- plans for forest fire protection at the departmental scale that set out the measures to be taken to prevent and manage forest fires, including establishing firebreaks, creating access routes for firefighting vehicles, and developing fire prevention policy.

To prevent wildfires, ONF collaborates closely with local authorities and other stakeholders. Additionally, it has the power to impose fines on those who break the law.

The Environment Code provides local plans to prevent and protect communities from fire risks. These plans, known as PPRIF, map out the areas that are most vulnerable to the risk and restrict building in the red zone (the riskiest area) while allowing building with restrictions in the blue zone (the intermediate area).

The CGCT oversees the organization and management of civil protection and rescue operations, such as managing forest fires. It outlines the duties and obligations of various stakeholders involved in emergency management such as:

- The Departmental Fire Services that are crucial in emergency response as they provide both ground and light aerial resources for firefighting.
- The General Directorate of Civil Security that are responsible for coordinating between departments and providing support, as well as managing the national fleet of planes.

The management and coordination of emergency response resources fall under the purview of the Departmental Fire Service. This organization operates under the leadership of the mayor of the city or the prefect when disasters impact multiple cities. Despite each department managing its funding and organizational structure, all fire services adhere to a national regulatory and training framework.

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Forest fire prevention and management involves collaboration between various organizations at both the departmental and local levels, including the ONF, local civil protection organizations, and forest management services. Their collective objective is to minimize the occurrence and impact of forest fires. During summer months, these organizations conduct regular patrols of the area, disseminate information to the public, and provide prompt initial responses to any potential fire outbreaks.

Early detection of potential wildfires is a critical aspect of effective firefighting. In the Southern region of France, watch towers or camera systems are presently employed for early detection, depending on the fire department's policy. During the most hazardous hours, the national fleet dispatches planes to survey the most high-risk areas.

In 2023, the Ministry of Ecology launched the PANOPTES study to assess a range of technologies, including cameras, IoT, satellites, and social media, with the aim of rapidly detecting and preventing forest fires within a 5-minute timeframe. The most efficient tools identified will be deployed to cover forested regions of mainland France in the near future, excluding overseas territories.

2.6.2 FirEUrisk survey on Wildfire Management Policies (France)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildfire Management Policies in France

Overview

France has a comprehensive and multi-tiered approach to wildfire management, involving various national and regional organizations, as well as a series of laws and decrees. The policies cover prevention, response, and restoration efforts, with different organizations and laws focusing on different aspects of wildfire management.

Organizations Involved

1. **Ministère de l'Intérieur (Ministry of the Interior)**: This national regulatory authority is inclusive in both prevention and response to wildfires but does not participate in restoration. Link
2. **Ministère de l'Agriculture et de l'Alimentation (Ministry of Agriculture and Food)**: This national regulatory authority is involved in prevention and restoration but does not participate in response. Link
3. **Ministère de la Transition écologique (Ministry of Ecological Transition)**: This national regulatory authority is involved in prevention and restoration but does not participate in response. Link
4. **Office National des Forêts**: This service, under the authority of the national regulatory power, is supervised by the Ministry of Agriculture and Food and the Ministry of Ecological Transition. It is involved in all aspects of wildfire management: prevention, response, and restoration. Link
5. **Services Départementaux d'Incendie et de Secours**: This service, under the authority of the regional regulatory power, is involved in prevention and response but does not participate in restoration. Link

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6. **Préfectures**: These regional regulatory authorities are involved in all aspects of wildfire management: prevention, response, and restoration. Link
7. **Mairies**: These local regulatory authorities are involved in all aspects of wildfire management: prevention, response, and restoration. Link

Laws and Decrees

A series of laws and decrees govern wildfire management in France. These laws are applied by various services at the national level and focus on different aspects of wildfire management.

1. **Ordinance No. 2012-92 of January 26, 2012**: This ordinance intervenes in the Forest Code and the Code of Tourism. It is applied by the state, local authorities and their groups, authorized trade union associations, departmental and territorial fire and rescue services, the National Forestry Office, and landowners. It focuses exclusively on prevention.
2. **Law No. 2021-1520 of 25 November 2021**: This law intervenes in the Forest Code and is applied by the state, local authorities and their groups, authorized trade union associations, departmental and territorial fire and rescue services, and the National Forestry Office. It focuses exclusively on prevention.
3. **Law No. 2021-1104 of August 22, 2021**: This law intervenes in the Forest Code and is applied by prefectures, town halls, and owners of areas particularly exposed to fires. It focuses exclusively on prevention.
4. **Law No. 2013-403 of May 17, 2013**: This law intervenes in the Forest Code and the Environmental Code. It is applied by the Board of State, prefectures
4. **Law No. 2013-403 of May 17, 2013**: This law intervenes in the Forest Code and the Environmental Code. It is applied by the Board of State, prefectures, town halls, and owners of areas particularly exposed to fires. It focuses on prevention and restoration.
5. **Decree No. 2021-955 of July 19, 2021**: This decree intervenes in the Forest Code and the Environmental Code. It is applied by the Board of State, prefectures, town halls, and owners of areas particularly exposed to fires. It focuses on prevention and restoration.
6. **Decree No. 2021-1198 of September 15, 2021**: This decree intervenes in the Forest Code and the Environmental Code. It is applied by the Board of State, prefectures, town halls, and owners of areas particularly exposed to fires. It focuses on prevention and restoration.
7. **Decree No. 2021-1418 of November 12, 2021**: This decree intervenes in the Forest Code and the Environmental Code. It is applied by the Board of State, prefectures, town halls, and owners of areas particularly exposed to fires. It focuses on prevention and restoration.
8. **Decree No. 2021-1419 of November 12, 2021**: This decree intervenes in the Forest Code and the Environmental Code. It is applied by the Board of State, prefectures, town halls, and owners of areas particularly exposed to fires. It focuses on prevention and restoration.

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France's wildfire management policies are comprehensive and involve a variety of organizations at the national, regional, and local levels. These policies are governed by a series of laws and decrees that focus on different aspects of wildfire management, including prevention, response, and restoration. The implementation of these policies is carried out by various services and authorities, demonstrating a multi-tiered approach to wildfire management.

Please note that this is a summary of the information found in the documents and the actual policies may contain more details and nuances. For a more in-depth understanding, it is recommended to refer to the original documents and the respective organizations.

2.7 Wildfire management policies in ITALY

2.7.1 General status

According to Italian National Laws, the Regional Administrations are in charge of forest fire management in their territories, including forest fire forecast, monitoring, prevention, and fighting. Each Italian Region has its own legislation and policies for forest fire management, which must comply with the National legislation and define the specific measures and responsibilities for the different phases of forest fire management. Taking into account the local climate, topography, vegetation types, socioeconomic conditions, and else, the Regions organize their own regional forest fire fighting systems, including forest workers and regional Forest Services (after January 2016, the Regional Forest Service is only active in the Autonomous Regions of Sardinia, Valle d'Aosta, Friuli Venezia Giulia, and Sicily, and in the Autonomous Provinces of Trento and Bolzano), volunteers, terrestrial and aerial suppression forces: the management and coordination of the regional fire management are devoted to a Regional Common Operational Room. The Regions can sign specific agreements with the National Fire Corps (CNVVF) for forest fire fighting and with police, forestry, and volunteer bodies for specific activities linked with fire management. The CNVVF is responsible for extinguishing fires when rural-urban interfaces and people are threatened.
The Italian State coordinates, through the Unified Air Operational Center (COAU) of the Civil Protection Department (DPC), the National Forest fire fighting fleet: 18 Canadairs CL 415 and 6 heavy helicopters Erickson S64, all of them owned and managed by the CNVVF. During the summer fire season, military helicopters and other medium-size helicopters from the CNVVF are also available.
Other Institutions are involved in forest fire management in Italy: *Arma dei Carabinieri* for forest fire investigations and crime prevention; Ministry of Environment and Energy Security for forest fire fighting plans in protected areas; Ministry of Agriculture, Food Sovereignty and Forestry, which is involved in technical prevention through the National Forestry Strategy (NFS) (as specified below).

In 2021, after a complex fires season, the Government issued new regulations (Legislative Decree 120/2021 and Law 155/2021) to improve coordination and forecasting capacities, as well as prevention and response to forest fires with the following main aims:
• improving the forecasting and alerting capabilities of the DPC for the whole Italian territory;

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• enhancing the response capacity of the National aerial fleet with additional aircrafts and helicopters and more infrastructures to service the fleet;
• upgrading air and ground response assets and enhancing training activities;
• improving the update rate of the burned area databases.

According to this Law, the DPC prepares - with the help of an inter-institutional technical committee - a "National coordination plan for technological updating" to increase the operational capacity in forecasting, prevention, and active fight of forest fires. The Law also proposed heavier administrative sanctions and amendments to the Penal Code for forest fire crimes. Furthermore, this Law established a three-year funding plan (2021-2023) and assigned part of the resources of the National Strategy for the development of internal areas of the Country (100 million euro for the period 2021-2023) to fund local Authorities for projects, actions, and measures to prevent forest fires in fire-prone areas, to deter the abandonment of forest and rural activities, and to enhance and protect forest heritages.

Another recent strategy issued in 2022 (the National Forest Strategy, SFN) aims at reorganizing the coordination of the fire management system at the Regional and National levels, fostering forest fire forecast and prevention with an environmental-forestry and land-use planning point of view, to promote forest (and related services) resistance and resilience to fires. The SFN is valid for 20 years and revised every five years and represents a strategic document in which forests are acknowledged as a national asset. According to the SFN, the right level of coordination should be traced back to the Presidency of the Council of Ministers within the framework of an inter-institutional forest fire monitoring table. The SFN proposed, in this sense, three main actions aiming at:

- promoting technical and operational actions to integrate and coordinate those sectors at different levels, focusing on forecast, prevention, and firefighting;
- providing the establishment of a permanent inter-institutional steering table, coordinated by the Ministry of Agriculture, Food Sovereignty and Forestry, to support the Civil Protection and the Presidency of the Council of Ministers as a center for reference, coordination, and direction for institutions, administrative and technical-scientific regional and national sectors;
- promoting a more unified and uniform application of ministerial regional fire management and planning guidelines.

2.7.2 FirEUrisk survey on Wildfire Management Policies (Italy)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildfire Management Policies in Italy

Italy has a comprehensive set of wildfire management policies implemented by various organizations at the local, regional, and national levels. These policies cover prevention, response, and restoration activities related to wildfires. Here is an overview of the key organizations and their roles:

Local Level

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1. **Corpo forestale provinciale**: Operated by the Autonomous Province of Bolzano, this organization is inclusive in both prevention and response to wildfires. It focuses on prevention and coordination of extinguishing forest fires.
2. **DEPARTMENT OF CIVIL PROTECTION, FORESTS, AND WILDLIFE**: This organization, run by the Autonomous Province of Trento, is exclusively responsible for response activities. It takes care of firefighting and civil protection activities, also in relation to the State, the regions, and the national civil protection.
3. **SERV. ANTINCENDI E PROTEZIONE CIVILE**: This service, also under the Autonomous Province of Trento, manages and organizes the operational and technical structure of the provincial permanent body of firefighters. It manages the fire prevention activity in the provincial territory in application of state and provincial regulations.
4. **Servizio Foreste**: This service, under the Autonomous Province of Trento, manages the conservation and improvement of the forest-pastoral and mountain territory through forest planning, the defence of the woods from fires.

National Level

1. **CUFA (Comando Unità Forestali, Ambientali e Agroalimentari Carabinieri)**: Under the Ministry of Defence, CUFA is exclusively responsible for response activities, focusing on repressive and investigative tasks.
2. **Corpo Nazionale dei Vigili del Fuoco (Fire Brigade) CNVVF**: Under the Ministry of the Interior, CNVVF is exclusively responsible for response activities. It contributes to fighting forest fires through coordination of extinguishing operations.
3. **Department of Civil Protection, Central Operations Centre (CFC)**: Under the Presidency of the Council of Ministers, CFC is exclusively responsible for response activities. It operates the alert system, prepares predictions based on climatic-meteorological, vegetation, physical conditions, and guarantees and coordinates the aircraft activities of fire extinguishment.

Regional Level

1. **Corpo Valdostano dei Vigili del fuoco**: Under the Autonomous Region of Aosta Valley, this organization is inclusive in response activities, with auxiliary activity on forest fires and primary activity on urban-rural interface fires.
2. **Struttura Protezione Civile (PC)**: Under the Autonomous Region of Aosta Valley, this organization is inclusive in both prevention and response activities. It manages the air vehicles of the regional fleet and management of the Rescue Center (CUS).
3. **Corpo forestale della Valle d'Aosta**: Under the *Dipartimento Agricoltura, Risorse naturali e Corpo forestale*, this organization is inclusive in both prevention and response activities.
4. ***Agenzia Forestale Regionale per lo Sviluppo del Territorio e dell'Ambiente della Sardegna* (FoReSTAS)**: Under the Sardinia Autonomous Region, this organization is inclusive in prevention, response, and restoration activities.
5. ***Agenzia Regionale per la Protezione dell'Ambiente per la Sardegna (ARPAS)***: Under the Sardinia Autonomous Region, this organization is inclusive in prevention activities. It ensures the correct

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functioning of the meteo-climatic networks, the meteorological radar, the Meteosat MSG satellite station, and the meteorological modeling chain.

6. ***Corpo Forestale e di Vigilanza Ambientale*** **(CFVA)**: Under the Sardinia Autonomous Region, this organization is inclusive# Wildfire Management Policies in Italy

Italy has a comprehensive set of policies and organizations dedicated to the prevention, response, and restoration efforts related to wildfires. These policies are implemented at various levels, including national, regional, and local levels, and involve different ministries and autonomous provinces.

Organizations and Their Roles

1. **Corpo forestale provinciale**: This local organization under the Autonomous Province of Bolzano is inclusive in both prevention and response to wildfires. It is primarily responsible for the prevention and coordination of extinguishing forest fires.
2. **DEPARTMENT OF CIVIL PROTECTION, FORESTS, AND WILDLIFE**: This local organization under the Autonomous Province of Trento is exclusively responsible for response. It takes care of firefighting and civil protection activities, also in relation to the State, the regions, and the national civil protection.
3. **SERV. ANTINCENDI E PROTEZIONE CIVILE**: This local organization under the Autonomous Province of Trento manages and organizes the operational and technical structure of the provincial permanent body of firefighters. It manages the fire prevention activity in the provincial territory in application of state and provincial regulations.
4. **Servizio Foreste**: This local organization under the Autonomous Province of Trento manages the conservation and improvement of the forest-pastoral and mountain territory through forest planning, the defense of the woods from fires.
5. **CUFA (Comando Unità Forestali, Ambientali e Agroalimentari Carabinieri)**: This national organization under the Ministry of Defence is exclusively responsible for response. It carries out repressive and investigative tasks.
6. **Corpo Nazionale dei Vigili del Fuoco (Fire Brigade) CNVVF**: This national organization under the Ministry of the Interior is exclusively responsible for response. It contributes to fighting forest fires through coordination of extinguishing operations.
7. **Department of Civil Protection, Central Operations Centre (CFC)**: This national organization under the Presidency of the Council of Ministers is exclusively responsible for response. It operates the alert system and prepares predictions based on climatic-meteorological, vegetation, physical conditions.
8. **Corpo valdostano dei Vigili del fuoco**: This regional organization under the Autonomous Region of Aosta Valley is responsible for auxiliary activity on forest fires and primary activity on urban-rural interface fires.
9. **Struttura Protezione Civile (PC)**: This regional organization under the Autonomous Region of Aosta Valley is inclusive in both prevention and response to wildfires. It manages the air vehicles of the regional fleet and management of the Rescue Center (CUS).
10. **Corpo forestale della Valle d'Aosta**: This regional organization under the Dipartimento Agricoltura, Risorse naturali e Corpo forestale is inclusive in both prevention and response to wildfires.

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11. **Agenzia Forestale Regionale per lo Sviluppo del Territorio e dell'Ambiente della Sardegna (FoReSTAS)**: This regional organization under the Sardinia Autonomous Region - Assessorato della difesa dell'ambiente (Environmental defense department) is inclusive in prevention, response, and restoration efforts related to wildfires.
12. **Agenzia Regionale per la Protezione dell'Ambiente per la Sardegna (ARPAS)**: This regional organization under the Sardinia Autonomous Region - Assessorato della difesa dell'ambiente (Environmental defense department) is inclusive in prevention. It ensures the correct functioning of the meteo-climatic networks, the meteorological radar, the Meteosat MSG satellite station, and the meteorological modeling chain.
13. **Corpo Forestale e di Vigilanza Ambientale (CFVA)**: This regional organization under the Sardin

Legislative context

1. Regional Council Resolution no 444, 19.07.21

Applied by the Abruzzo Region, this policy is inclusive in terms of prevention and response. The policy is implemented through the Regional Fire Management Plan (RFM Plan).

2. Forest Low n. 3 del 04/01/2014

This policy is also applied by the Abruzzo Region and is inclusive in terms of prevention, response, and restoration.

3. Regional Council Resolution n. 58572018

Applied by the Apulia Region, this policy is inclusive in terms of prevention and response. The policy is implemented through the Regional Fire Management Plan (RFM Plan).

4. Forest Law, n. 12/2012

This policy is applied by the Apulia Region and is inclusive in terms of prevention and response.

5. Regional Fire Management Plan (RFM Plan)

This policy is applied by the Autonomous Province of Trento and is inclusive in terms of prevention, response, and restoration.

6. Provincial Law 23 May 2007, n. 11

Applied by the Autonomous Province of Trento, this policy is inclusive in terms of prevention and restoration.

7. Decree of the President of the Region n. 101 dated 15/02/2018

Applied by the Autonomous Region of Aosta Valley, this policy is inclusive in terms of prevention, response, and restoration. The policy is implemented through the Regional Fire Management Plan (RFM Plan).

8. Regional Council Resolution n. 652/2018

Applied by the Basilicata Region, this policy is inclusive in terms of prevention and response. The policy is implemented through the Regional Fire Management Plan (RFM Plan).

9. Forest Law, n. 11/2004

This policy is applied by the Basilicata Region and is inclusive in terms of prevention and response.

10. Regional Fire Management Plan (RFM Plan)

This policy is applied by the Calabria Region and is inclusive in terms of prevention and response. The policy is implemented through the Regional Fire Management Plan (RFM Plan).

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11. Forest Law 12 ottobre 2012, n. 45

This policy is applied by the Calabria Region and is inclusive in terms of prevention, response, and restoration.

12. Regional Council Resolution n. 250/2021

Applied by the Campania Region, this policy is inclusive in terms of prevention, response, and restoration. The policy is implemented through the Regional Fire Management Plan (RFM Plan).

13. Regional Law, n. 12/2017 "Sistema di Protezione Civile in Campania"

This policy is applied by the Campania Region and is inclusive in terms of prevention.

14. Forest Law, n. 14/2006

This policy is applied by the Campania Region and is inclusive in terms of prevention, response, and restoration.

15. Regional Fire Management Plan (RFM Plan)

This policy is applied by the Emilia Romagna Region and is inclusive in terms of prevention and response. The policy is implemented through the Regional Fire Management Plan (RFM Plan).

16. Regional Forest Law, n.30 1981

This policy is applied by the Emilia Romagna Region and is inclusive in terms of prevention and response.

17. Resolution 15 May 2020, n. 270

Applied by the Lazio Region, this policy is inclusive in terms of prevention and response. The policy is implemented through the Regional Fire Management Plan (RFM Plan).

18. Regional Forest Law, n.39 2002

This policy is applied by the Lazio Region and is inclusive in terms of prevention, response, and restoration.

19. Regional Council Resolution no. 1098 14/12/2018

Applied by the Liguria Region, this policy is inclusive in terms of prevention and response. The policy is implemented through the Regional Fire Management Plan (RFM Plan). **(**https://www.agriligurianet.it/it/impresa/politiche-di-sviluppo/tutela-economia-bosco/antincendio-boschivo/piano-di

Complementary Information

Italy is characterized by the highly fragmented institutional framework in the forest (and fire) system: 21 regional or provincial public authorities (regions or autonomous provinces) manage the forest sector tasks, mostly decentralized since the 1970s. Thus there is a heterogeneous framework of regional forest policies, including fire management, with priorities and issues that vary from region to region. Recently, a new national Forest Law trying to address the sector as a whole was approved in 2018 (Law No. 34/2018).

Fire Management

The framework law on forest fires dates back to 2000 (Law No. 353/2000), and firstly defines the primary role of the regions in forecasting, prevention and active fight against forest fires. The Law:

- Sets out principles governing fire-fighting activities aimed at the protection and conservation of forests. Regions shall lay down further provisions.
- Regions must approve the fire-forecast, fire-prevention and fire-fighting activities (Regional Fire Management Plans).

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- Government and the Regions must jointly contribute to the development of formative as well as informative activities.
- Regions can use the resources, means and personnel of the Fire Brigades (*Corpo Nazionale Vigili del Fuoco* (CNVVF)) and - up to 2016 - of the National Forest Service (*Corpo Forestale dello Stato* (CFS)), by means of annual program agreements.
- Regions have the competence to coordinate ground operations and the use of airplanes; competence that was often referred to the CFS

2.8 Wildfire management policies in GREECE

2.8.1 General status

In 1999, the management of wildfires in Greece was transferred from the Forest Service to the Fire Service. Unfortunately, this policy resulted in catastrophic wildfires in 2007, 2018, and 2021, claiming not only natural resources and properties but also the lives of several citizens.

Currently, the responsibility for firefighting and forest fire management in Greece is primarily held by the Hellenic Fire Service (the operational branch of the General Secretariat of Civil Protection under the Ministry of Climate Change and Citizen Protection). Fire protection is a shared competence between the state and the regions.

The oorganisational Structure includes:

- The Hellenic Fire Service (HFS) which is primarily responsible for wildfire suppression, supported by the Hellenic Air Force and the Hellenic Army if needed. The HFS also has Special Disaster Response Units. The HFS is supported by the General Secretariat for Civil Protection, which coordinates the response to wildfires and other disasters across multiple agencies, including the HFS, regional governments, the Hellenic Army, and volunteer organizations.
- The Greek Forest Service, under the Ministry of Environment and Energy, is responsible for forest management, including forest fire prevention measures.
- Regional and municipal governments also have roles in fire prevention and first intervention, including maintaining local firebreaks and conducting public education campaigns.

The framework for fire management is laid out in a number of laws and regulations, including Law 1338/83, Law 1515/85, and Law 1561/85. Forest fires are considered a criminal act in Greece, and persons found responsible can face severe penalties.

Regarding the policy, the Hellenic Fire Service follows a strategy of aggressive initial attack to keep fires small and manageable. Fire prevention measures include creating and maintaining firebreaks, managing vegetation, and conducting prescribed burns to reduce fuel load.

The wildfire response in Greece is assigned to the Hellenic Fire Service, which is centralized and coordinated by the General Secretariat for Civil Protection. They belong to the new Ministry of Civil Protection and Climate Crisis. The GSCP operates the 112 Emergency Service, which is used systematically as the alert mechanism for wildfires in the last 3 years.

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The Fire Service in Greece operates nationally with a modern C&C system (ENGAGE) for supporting firefighting operations and coordination. The HFS is technologically well-equipped, and a huge procurement program for ground and aerial fire-fighting means is ongoing called AEGIS. Additionally, there is a long and rich WFM R&D activity.
Despite the technological advancements and responsive approach of wildfire management policymaking in Greece, it is not enough to address the preventive and integrated policy required. Greece is a representative example of other EU Member States facing similar challenges in wildfire management policymaking.
The General Secretariat for Civil Protection conducts public education campaigns to raise awareness, reduce human-caused fires and increase the population's preparedness.
The Greek government runs a program called "Forest Maps" to define the forest profile of the country areas, which can be a useful spatial infrastructure for fire reduction plans. However, this program is irrelevant to address the lack of central coordination and concrete prevention policy.
At the national level, the main legislation governing forest fire management in Greece is the Forest Law (Law 998/1979), which sets out the rules and guidelines for the management and protection of forests in Greece. The law establishes the responsibilities of different actors involved in forest management, including the Ministry of Environment and Energy and the Forest Service, which is responsible for managing state-owned forests, and private forest owners, who are responsible for managing their own forests.
The Civil Protection Law (Law 3306/2005) also plays an important role in forest fire management in Greece. The law regulates the organization and management of civil protection and rescue activities in Greece, including forest fire management. It sets out the roles and responsibilities of different actors involved in emergency management, including the Hellenic Fire Service, responsible for coordinating firefighting activities at the national level, and regional and local authorities, responsible for coordinating firefighting activities at the regional and local levels.
At the regional level, each of Greece's 13 regions has its own legislation and policies for forest fire management, which must comply with the national legislation. These regional laws establish the specific measures and responsibilities for preventing and fighting forest fires in each region, taking into account the local climate, terrain, and vegetation types.

In terms of organizational structure, Greece's forest fire management system is complex and involves many different actors and organizations at the national, regional, and local levels. The Forest Service is responsible for the management of state-owned forests and for implementing forest fire management policies and measures. The Hellenic Fire Service is responsible for coordinating firefighting and rescue operations during emergencies. Regional and local authorities are responsible for coordinating firefighting activities at the regional and local levels.

2.8.2 FirEUrisk survey on Wildfire Management Policies (Greece)

During the summer months in Greece, forest fires pose a significant threat. Nonetheless, the country has a well-organized system in place to manage forest fires that involve multiple ministries and agencies at the national, regional, and local levels. The Ministry of Climate Crisis and Civil Protection, along with its General

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Secretariat for Civil Protection and the Hellenic Fire Service, are the primary agencies responsible for forest fire management. At the national level, the General Directorate for Forests and Natural Environment (Forest Service) works alongside the General Secretariat for Civil Protection to prevent, suppress, and restore forests. The Forest Service collaborates with local and regional authorities to coordinate firefighting efforts and is responsible for implementing policies and strategies related to forest fire prevention, restoration, and reforestation activities.

The General Secretariat for Civil Protection issues daily maps of fire risks that are shared with all relevant authorities and organizations. They are responsible for coordinating the national response to forest fires, including deploying firefighting resources, managing evacuation procedures, and facilitating communication between agencies involved in the response effort. The Hellenic Fire Service operates a modern command and control system that allows for efficient management of all operational resources at the national level in real time.

Every municipality has volunteer organizations and civil protection offices at the local level. These organizations support firefighting efforts under the orders of the Fire Service and provide additional resources and manpower. Although not always adequately trained and qualified, personnel in civil protection offices play a critical role in the early detection and suppression of forest fires. They also work to raise awareness and educate the public on fire prevention measures.

While Greece's forest fire management organizational structure is complex, the lack of coordination and information sharing between agencies remains a significant challenge. Addressing these challenges will require improved communication and collaboration between all stakeholders involved in forest fire management.

Legislative framework

There are several pieces of legislation related to forest fire management in Greece. The most significant with their more recent updates are summarized here next:

- "Regulation of the organized evacuation of citizens in case of forest fires" (Law 4308/2014): This regulation outlines the procedures to be followed in the event of an organized evacuation of citizens due to a forest fire. It includes guidelines for assessing the danger level of a forest fire, determining the need for evacuation, and coordinating evacuation efforts.
- "Forest Fire Regulation" (Law 4685/2020): This regulation provides guidelines for preventing and suppressing forest fires in Greece. It outlines the responsibilities of various agencies involved in forest fire management, including the Ministry of Environment and Energy, the General Secretariat for Civil Protection, and the Hellenic Fire Service. It also includes guidelines for planning and implementing forest fire prevention measures and procedures for reporting and responding to forest fires.
- "Map of forest fire risk prevention" (Law 4685/2020): This map provides information on the level of fire risk in different areas of Greece. It is used by various agencies involved in forest fire management to coordinate prevention efforts and allocate resources.
- "Special Areas of Forest Fire Risk Management" (Law 4308/2014): This legislation designates certain areas of Greece as "Special Areas of Forest Fire Risk Management." This designation is based on the

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area's fire risk level and allows for the implementation of specific prevention and suppression measures in these areas.

- "Amendment to the Forest Fire Regulation" (Law 4685/2020): This amendment to the Forest Fire Regulation updates the guidelines for preventing and suppressing forest fires in Greece. It includes provisions for creating firebreaks, managing vegetation, and using firefighting equipment.
- "Establishment of the Forest Fire Risk Management Unit" (Ministerial Decision 181752/2022): This legislation establishes a Forest Fire Risk Management Unit within the General Secretariat for Civil Protection. The unit coordinates forest fire prevention and suppression efforts at the national level.
- "Forest Firefighting Fund" (Ministerial Decision 29321/2022): This legislation establishes a Forest Firefighting Fund to finance forest fire prevention and suppression efforts in Greece. The fund is financed through a tax on forested lands and is used to support prevention measures, firefighting equipment, and compensation for damages caused by forest fires.
- "Ministerial Decision on the designation of forest firefighting bodies" (Ministerial Decision 61420/2019): This decision designates various agencies and organizations as forest firefighting bodies and outlines their responsibilities for preventing and suppressing forest fires.
- "Ministerial Decision on the creation of forest firefighting teams" (Ministerial Decision 55904/2019): This decision creates forest firefighting teams within the designated forest firefighting bodies. The teams are responsible for responding to forest fires and implementing prevention measures.
- "Presidential Decree on forest fire prevention measures" (2018): This decree outlines the prevention measures to be taken to reduce the risk of forest fires. It includes guidelines for managing vegetation, creating firebreaks, and conducting controlled burns.
- "Law on forest protection" (1998) establishes guidelines for protecting forests in Greece. It includes provisions for preventing forest fires, managing vegetation, and protecting wildlife.
- "Presidential Decree on forest fires" (Presidential Decree U60/2018): This decree outlines the procedures to be followed during a forest fire. It includes guidelines for reporting and responding to forest fires and coordinating firefighting efforts.
- "Ministerial Decision on forest firefighting measures" (Presidential Decree U60/2018) establishes guidelines for preventing and suppressing forest fires in Greece. It includes provisions for creating firebreaks, managing vegetation, and conducting controlled burns.
- "Forest Firefighting Regulation" (Law 4685/2020): This regulation provides guidelines for forest firefighting in Greece. It includes provisions for organizing and deploying firefighting teams, as well as using firefighting equipment and coordinating efforts between agencies.
- "Ministerial Decision on forest firefighting bodies" (Ministerial Decision 61420/2019: This decision designates various agencies and organizations as forest firefighting bodies and outlines their responsibilities for preventing and suppressing forest fires.
- "Ministerial Decision on forest firefighting teams" " (Ministerial Decision 18851/2023): This decision creates forest firefighting teams within the designated forest firefighting bodies. The teams are responsible for responding to forest fires and implementing prevention measures.

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- "Ministerial Decision on forest firefighting measures" (Ministerial Decision 15005/2021): This decision outlines the prevention measures to be taken to reduce the risk of forest fires. It includes guidelines for managing vegetation, creating firebreaks, and conducting controlled burns.

These pieces of legislation provide a comprehensive framework for forest fire management in Greece, including guidelines for prevention, suppression, and recovery efforts. They also establish specific agencies and units responsible for coordinating these efforts at the national level.

Funding instruments

Wildfire management funding in Greece involves a complex framework of diverse financial tools and resources from various national and European sources and is distributed among multiple beneficiaries. However, the concept of funding wildfire management does not exist in public administration, as financial data concerning this issue are neither recorded nor collected uniformly by the responsible public authorities. Available resources originate from multiple funding instruments, some of which finance only prevention actions, while others focus solely on suppression measures.

A complex interplay of various financial tools and resources from national and European sources characterizes Greece's funding landscape for wildfire management. However, the lack of a strategic approach, the intricate nature of the funding procedures, and the overemphasis on suppression actions raise concerns regarding the efficient and transparent management of resources. To improve wildfire management effectiveness, developing a comprehensive strategy, streamlining funding procedures, and balancing prevention and suppression efforts is imperative. These measures will contribute to a more resilient approach to wildfire management and better protect Greece's forests and communities.

The main funding sources and financial tools used for prevention and suppression of wildfires in Greece include the Public Investment Program (PIP), Annual Forest Protection Program, Green Fund, Central Autonomous Resources (C.A.R.), and the ESFA 2014-2020 programs. The funding allocation for prevention or suppression activities depends on various factors, including the overall design of funding instruments, different levels of administration, existing funding proposals, and political decisions regarding the allocation between prevention and suppression efforts.

However, the absence of a unified data collection system and standardized reporting mechanisms hinders effective oversight and evaluation of resource allocation, contributing to the lack of transparency and accountability in resource management. Additionally, the overemphasis on funding suppression activities rather than prevention measures undermines the long-term goal of mitigating wildfires. Allocating more resources towards prevention can reduce the frequency and intensity of wildfires, leading to substantial cost savings and protection of lives and ecosystems.

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2.9 Wildfire management policies in CROATIA

2.9.1 General status

Forest fire management policies in Croatia are mainly governed by the Forest Act, the Law on Fire Protection, and the Law on Protection and Rescue.

The Forest Act regulates the management, protection, and use of forests in Croatia. It provides for the establishment of the Croatian Forests, a state-owned company responsible for the management of forests and forest land in the country. The Croatian Forests is responsible for implementing fire prevention measures, organizing firefighting activities, and conducting research on forest fires.

The Law on Fire Protection regulates the prevention, detection, and suppression of fires in Croatia. It sets out the roles and responsibilities of various stakeholders involved in fire protection, including the Croatian Firefighting Association, firefighting units, and local authorities. The law also requires landowners to take measures to prevent fires on their property.

The Law on Protection and Rescue regulates the organization and management of civil protection and rescue activities in Croatia. It sets out the roles and responsibilities of various stakeholders involved in emergency management, including firefighting units, local authorities, and other emergency services.

The Croatian Forests is responsible for implementing forest fire management policies. It works closely with firefighting units and other stakeholders to prevent fires, detect and suppress fires when they occur, and restore forest areas damaged by fires. The Croatian Firefighting Association is also involved in fire prevention and suppression activities and provides training and support to firefighting units.

At the local level, municipalities and counties have a role to play in preventing wildfires by enforcing laws related to land use, regulating construction in forested areas, and educating the public about the risks of fire.

It's important to note that forest fire management policies and responsibilities can change over time, and the information provided may not be up-to-date or comprehensive.

Wildfire management in Croatia is a collaborative effort between various organizations: the Ministry of the Interior, the Ministry of Agriculture, and the Ministry of Environment and Energy. The Croatian Firefighting Association (CFA) is the primary agency responsible for wildfire prevention and management nationwide. Under its umbrella are 21 county firefighting services that operate independently. Aside from managing wildfires, the CFA also handles other emergencies like floods, earthquakes, and other natural disasters. The Croatian Forests Public Company (Hrvatske šume d.o.o.) manages and safeguards the country's forests. This includes implementing measures to prevent wildfires, such as clearing vegetation, monitoring weather conditions, and establishing firebreaks. Meanwhile, the National Protection and Rescue Directorate (DUZS) coordinates emergency responses for wildfires and other calamities. The Croatian Meteorological and Hydrological Service is also integral to the effort, providing weather forecasts and meteorological data to support wildfire management.

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2.10 Wildfire management policies in BULGARIA

2.10.1 General status

Bulgaria has a wildfire management policy that involves multiple organizations, including the Ministry of Agriculture, Food, and Forestry, the Ministry of Interior, and the Ministry of Defence.

The State Forestry Agency (SFA) is responsible for managing and protecting Bulgaria's forests, which includes implementing measures to prevent wildfires. The SFA's wildfire prevention measures include clearing vegetation, establishing firebreaks, and conducting public awareness campaigns. In addition to prevention, the SFA also coordinates with local firefighting services and other emergency response agencies to manage wildfires when they occur. SFA's report first when fire occur especially in wildland areas where fire watch towers are in place.

The Bulgarian Fire Safety and Population Protection Association (BFSPPA) is another key organization involved in wildfire management in Bulgaria. The BFSPPA's role includes coordinating firefighting efforts and managing emergency responses to wildfires and other disasters. BFSPPA is the successor of the Ministry of Civil Protection that was merged in 2010 with the Firefighting department of MoI in Bulgaria.

The Bulgarian Academy of Sciences provides scientific and technical support for wildfire management in Bulgaria, and participate in the coordination measures in cases of extreme fire event that last for longer than several days alongside with the Ministry of Defence who bring the life force on the spot.

Specifically, the academy's Forest Research Institute develops and implements research projects on wildfire prevention and management.

The National Institute of Meteorology and Hydrology also plays a role in wildfire management by providing weather forecasts and other meteorological data to support prevention and response efforts.

At the national level, the main legislation governing forest fire management in Bulgaria is the Forest Law *(Zakon za gorata)*, which sets out the rules and guidelines for managing and protecting forests in Bulgaria. The law establishes the responsibilities of different actors involved in forest management, including the Ministry of Agriculture and Food, which is responsible for the management of state-owned forests, and private forest owners, who are responsible for managing their forests.

The Civil Protection Act (*Zakon za zashtita ot vchanso deistvie*) also plays an important role in forest fire management in Bulgaria. The act regulates the organization and management of Bulgaria's civil protection and rescue activities, including forest fire management. It sets out the roles and responsibilities of different actors involved in emergency management, including the Ministry of Interior, responsible for coordinating firefighting activities at the national level, and regional and local authorities, responsible for coordinating firefighting activities at the regional and local levels.

At the regional level, each of Bulgaria's 28 regions has its own legislation and policies for forest fire management, which must comply with the national legislation. These regional laws establish the specific measures and responsibilities for preventing and fighting forest fires in each region, considering the local climate, terrain, and vegetation types.

Regarding organizational structure, Bulgaria's forest fire management system is complex and involves many different actors and organizations at the national, regional, and local levels. The Forest Research Institute, part of the Bulgarian Academy of Sciences, is responsible for research and development related to forest fire

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management. The Bulgarian National Rescue Service is responsible for coordinating rescue and firefighting operations during emergencies alongside with the Ministry of Defence in the cases of extreme fires, and the State Forestry Agency is responsible for managing state-owned forests.

2.11 Wildfire management policies in ROMANIA

2.11.1 General status

In Romania, the management of wildfires is the responsibility of multiple organizations, including the Ministry of Environment, Waters and Forests, the Ministry of Internal Affairs, and the National Administration of Meteorology.

The Romanian Forest Service (Romsilva) is the primary agency responsible for managing and safeguarding Romania's forests, which includes activities related to wildfire prevention and suppression. Romsilva also monitors and enforces regulations related to forestry and environmental protection.

The General Inspectorate for Emergency Situations (IGSU) is responsible for coordinating emergency responses to wildfires and other disasters, including the deployment of firefighting teams and other resources. IGSU works closely with local firefighting services and other emergency response agencies to manage wildfires when they occur.

The National Administration of Meteorology provides weather forecasts and other meteorological data to support wildfire management efforts. This information is crucial for predicting the behaviour of wildfires and determining the best course of action for managing them.

The National Institute for Research and Development in Forestry provides scientific and technical support for wildfire prevention and management. This includes conducting investigations on the causes and effects of wildfires, developing new technologies and strategies for managing them, and providing training and education to those involved in wildfire management.

At the national level, the main legislation governing forest fire management in Romania is the Forest Code (*Codul Silvic*), which sets out the rules and guidelines for the management and protection of forests in Romania. The code establishes the responsibilities of different actors involved in forest management, including the National Forest Administration (A*dministrația Națională a Pădurilor*), which is responsible for the management of state-owned forests, and private forest owners, who are responsible for the management of their own forests.

The National Agency for Environmental Protection (*Agenția Națională pentru Protecția Mediului)* also plays an important role in forest fire management in Romania. The agency is responsible for developing and implementing environmental policies and regulations, including forest fire management. It sets out the roles and responsibilities of different actors involved in emergency management, including the National Inspectorate for Emergency Situations, responsible for coordinating firefighting activities at the national level, and regional and local authorities, responsible for coordinating firefighting activities at the regional and local levels.

At the regional level, each of Romania's 42 counties has its own legislation and policies for forest fire management, which must comply with the national legislation. These regional laws establish the specific

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measures and responsibilities for preventing and fighting forest fires in each region, considering the local climate, terrain, and vegetation types.
In terms of organizational structure, Romania's forest fire management system is complex and involves many different actors and organizations at the national, regional, and local levels. The National Forest Administration is responsible for the management of state-owned forests and for implementing forest fire management policies and measures. The National Inspectorate for Emergency Situations coordinates firefighting and rescue operations during emergencies. Regional and local authorities are responsible for coordinating firefighting activities at the regional and local levels.

2.11.2 FirEUrisk survey on Wildfire Management Policies (Romania)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildfire Management Policies in Romania

Organizations Involved

1. **Ministerul Mediului Apelor și Pădurilor (MMAP) / Ministry of Environment, Waters and Forests**: This is the national authority primarily responsible for managing forest fire risk in Romania. They are involved in prevention, response, and restoration efforts.
2. **Ministerul Afacerilor Interne (MAI) / Ministry of Internal Affairs**: MAI plays a secondary role in managing forest fire risk. They are responsible for restoration actions like investigation of the fire event, assessment of the fire event impact, and restoration of the normality state.
3. **Garda Forestieră/Forestry Guard**: These are territorial public institutions responsible for implementing and controlling the application of forestry and hunting in the national forest fund and forest vegetation on land outside the national forest fund. They perform the role of state authority on forest fire protection in their area of competence.
4. **Garda Forestiera Națională/National Forestry Guard**: Founded in July 2021, this organization coordinates the territorial Forestry Guards.
5. **Regina Nationala a Padurilor ROMSILVA/National Forest Administration ROMSILVA**: This state agency administers the public forests, which make up around 50% of the forest surface in Romania.
6. **State and private forest districts**: These local structures are responsible for forest fire risk mitigation, response, and ecological restoration. They are generally the first responders in case of a fire.
7. **Forest owners**: They provide the necessary financial, material, and human resources for the protection of the forest against fires.
8. **Inspectoratul General pentru Situatii de Urgență (IGSU)/ General Inspectorate for Emergency Situations**: This organization coordinates the County Emergency Inspectorates and leads the intervention actions for forest fire extinguishing, protection, and rescue of persons at the national level.

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9. **Inspectoratele pentru Situaţii de Urgenţă Judeţene/ County Emergency Inspectorates**: These military structures are in charge of prevention, response, and restoration of forest fires at the county level.
10. **Structurile Politiei Române/ Romanian Police Structures**: They carry out public order actions, provide security during the evacuation of the population and material goods, and participate in the investigation and establishment of the causes of fire.
11. **Structurile Jandarmeriei Române/ The structures of the Romanian Gendarmerie**: They ensure the security and surveillance of the affected/evacuated areas and support the evacuation of people, animals, and property.
12. **Inspectoratul General de Aviație/ General Aviation Inspectorate**: They participate in reconnaissance missions in forest fire monitoring and in the actions of extinguishing forest fires.
13. **MINISTERUL APĂRĂRII NAŢIONALE/ Ministry of National Defense**: They participate in forest firefighting with emergency response capabilities and support other response structures at the national level.
14. **MINISTERUL EDUCAŢIEI/ MINISTRY OF EDUCATION**: They are responsible for education for emergency situations.
15. **MINISTERUL TRANSPORTURILOR ŞI INFRASTRUCTURII/ MINISTRY OF TRANSPORT AND INFRASTRUCTURE**: They ensure the regulation of the traffic on the road and railway infrastructure affected by the forest fires.
16. **Administraţia Naţională de Meteorologie/ National Meteorological Administration**: They transmit regionalmeteorological information and warnings issued by the Regional Meteorological Centers in case of dangerous meteorological phenomena (drought, heat wave, and wind) to the Emergency Operations Center with permanent activity within the Ministry of Environment, Waters and Forests, to the Inspectorates County / Bucharest-Ilfov for Emergency Situations, for taking the necessary preventive measures, notifying the local public administration authorities, warning and / or alerting the population in due time.
17. **COUNTY AND LOCAL AUTHORITIES**: They ensure the necessary funds for the endowment of the Voluntary Services for emergency situations with materials and means specific to the forest fire intervention; constantly inform the public about the urgent measures to be applied (including through the media), their warning and alarming; ensuring the functioning of the information flow between the County Committee for Emergency Situations and the central public administration with responsibilities in the field.

Laws and Decrees

Several laws and decrees guide the wildfire management policies in Romania, including:

1. **Decision No 1313/2013 / EU**: From the European Parliament and the Council of Europe on the Union Civil Protection Mechanism.

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2. **Law no. 46/2008 Forestry Code**: The main forestry law from the Romanian Parliament.
3. **Law no. 307 of July 12, 2006**: The main general fire protection law from the Romanian Parliament.
4. **Law no. 481 of November 8, 2004**: The main civil protection law from the Romanian Parliament.
5. **Emergency Ordinance no. 21 of April 15, 2004**: On the National Emergency Management System from the Romanian Government.
6. **Emergency Ordinance no. 77 of March 3, 2021**: The establishment of the National Forest Guard from the Romanian Government.
7. **Government Decision no. 557 of August 3, 2016**: Regarding the management of risk types.
8. **Government Decision no. 1491 of September 9, 2004**: Approving the Framework Regulation on the organizational structure, tasks, operation, and staffing of emergency operational committees and centers.
9. **Government Decision no. 762 of July 16, 2008**: The approval of the National Strategy for the prevention of emergencies.
10. **Government Decision 743 of September 9, 2015**: On the organization and functioning of the Forest Guards from the Ministry of Environment and Forests.
11. **COMMON ORDER no. 551/1475 of August 8, 2006**: Approving the Regulation on monitoring and managing the risks of hail and severe drought, the Regulation on emergency management in the field of phytosanitary - invasions of pests and contamination of agricultural crops with phytosanitary products and of the Regulation on the management of emergencies as a result of forest fires.
12. **Ministerial Order no. 163 of February 28, 2007**: The approval of the General Norms for fire protection from the Ministry of Internal Affairs.
13. **Ministerial Order no. 456 of March 3, 2016**: The approval of the Regulation on the organization and functioning of the Forest Guards from the Ministry of Environment and Forests.
14. **Ministerial Order no. 2579 of July 9, 2012**: The approval of the information-decisional flow of warning-alarm in case of emergencies generated by the specific risks of the Ministry of Environment and Forests.
15. **National concept of response in case of forest fires, 2018**: National concept of response in case of forest fires from the Ministry of Internal Affairs.
16. **National Disaster Risk Management Plan, 2020**: National Disaster Risk Management Plan from

Policies

1. **Forest Policy**: The Ministry of Environment, Waters and Forests is responsible for a national policy that includes measures for prevention, response, and restoration in the event of wildfires. This policy

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ensures that forests are managed sustainably and that measures are in place to mitigate the risk of wildfires.

2. **Fire Policy**: Both the Ministry of Environment, Waters and Forests and the Ministry of Internal Affairs are involved in a national fire policy. This policy includes measures for prevention and response to wildfires, ensuring that there are procedures in place to respond effectively when wildfires occur.
3. **Civil Protection Policy**: The Ministry of Internal Affairs is responsible for a national civil protection policy. This policy includes measures for prevention of wildfires, ensuring that civil protection measures are in place to protect communities from the risk of wildfires.

Investments

1. **National Budget (state)**: Both the Ministry of Environment, Waters and Forests and the Ministry of Internal Affairs receive funding from the national budget for wildfire management. This funding supports measures for prevention, response, and restoration.
2. **National Budget (state)**: The Ministry of National Defense also receives funding from the national budget for wildfire management. This funding supports measures for prevention and response.
3. **European Structural & Investment Fund**: The Ministry of Internal Affairs and the Ministry of Regional Development and Public Administration receive funding from the European Structural & Investment Fund. This funding has been used to purchase special vehicles designed for forest fire response and helicopters with bambi buckets. A national risk assessment for 11 natural disasters, including forest fires, was also conducted through a project co-financed by the European Social Fund.
4. **Other**: Forest administrators and Forest Owners also invest in wildfire management at a local level. This investment supports measures for prevention, response, and restoration.
5. **Regional Budget (state)**: County and local authorities receive funding from the regional budget for wildfire management. This funding supports measures for prevention, response, and restoration.

2.12 Wildfire management policies in SWEEDEN

2.12.1 General status

Sweden's area and population are divided into 290 municipalities with a median population of 16 300 and a median area of 643 km^2. 25 % of the municipalities have a population density ≤10 inhabitants/ km^2. Each municipality has a high degree of autonomy and is by law responsible to prevent and respond to accidents within the municipal boarders. Despite being a heavily forested country dominated by flammable coniferous forest, Sweden lacks a specialised wildfire organisation. Instead, forest fires are handled by multipurpose rescue services organised at the municipal level where responsibility lies (Sjöström and Granström, 2023). There are no regulations or set national targets on wildfire training within these organisations but knowledge is mostly built on personal and group experience rather than formal education (Granström et al., 2023).

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The rescue service is required to handle the immediate threat at no cost to the landowner. Once the fire perimeter is contained, it is the responsibility of the landowner to care for surveillance and mop-up. Most land is owned by large forestry companies and surveillance is normally outsourced to contractors which normal tasks are thinning or planting, but often lack in-depth knowledge on mop-up. Should the landowner have very small resources the rescue services usually (but are not required to) stay and deal with mop-up and sharing of equipment. A key factor identified for the large area burnt during the 2018 fire season was insufficient surveillance and mop-up due to resource scarcity (Granström, 2020).

Until ten years ago, most municipalities had their individual rescue service organisations. This led to problems during border-crossing fires and to difficulties for small, often rural, municipalities to take in aerial resources since these competed with a tight municipal budget covering other core responsibilities such as education or child- and elderly care.

The last few years have seen significant changes in the organization of rescue services and resource availability. The national Swedish civil contingencies agency (MSB) has positioned 24 material deposits throughout the country that can be utilized by rescue services for free with equipment like six-wheelers, kilometers of hoses, pumps, etc. In addition, MSB is responsible for keeping ten helicopters and four fixed-wing aircrafts stand-by, strategically positioned throughout the country. Some of these are a part of the European rescEU resource sharing scheme. The rescue services can now utilize aerial resources at the government's expense instead of individual municipalities, significantly increasing the incitement for its use (MSB, 2023).

Moreover, MSB have written directives that essentially force the municipalities to join clusters of larger operational areas with common command and control centers from January 2022. This centralization aims to aid the individual rescue service during a large incident to organise resources from national resources, neighbouring municipalities and gather information on landowners, forecasts, and communication. For very large incidents, the rescue services can ask MSB to take over the incident's command using the municipal fire fighting forces. The changes made have mostly been appreciated but have not yet been thoroughly assessed.

Regarding preparedness, MSB has a contract with the Swedish Meteorological and Hydrological Institute (SMHI) to issue hourly updated fire danger maps for fire occurrence in forests and grasslands (https://www.smhi.se/vader/varningar-och-brandrisk/brandrisk). These maps form the basis for several regulations on what operations the public allows, and industries such as agricultural or forestry companies. The maps also serve the wildfire mobile app '*Brandrisk ute'*, which is operationalized by MSB and aimed for the public. SMHI also determines the ignitions detected by the satellite VIIRS system, which is then directly sent to the national emergency number 112. Other resources related to preparedness include the national maps on fuel classification on a 10 by 10-metre resolution, maps of suitable water sources for aerial firefighting, and guidance for rescue services for fighting wildfires.

The 21 counties of Sweden are responsible for tending to fire surveillance flights. These are contracted to private operators, and the counties can seek funding from national sources in retrospect.

The most commonly used preventive measure on wildfires in Sweden is the fire bans, issued either by municipalities or, in some cases, by a whole county. The fire bans are legally binding for the public and industries. In terms of land management, there are very few regulations in Sweden. Forestry operations are controlled by regulations issued by the National Forest Agency, but there are no binding regulations to aim

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management for less fire-prone forests. However, the Forest Agency issues guidance to landowners regarding their responsibility for surveillance and mop-up and publicly available maps on wet areas and forest damages from fires and bark beetle attacks (https://kartor.skogsstyrelsen.se/kartor/). The municipalities are responsible for maintaining safe neighbourhoods (access for fire trucks and alike) but no specific guidance or regulations on forming fire breaks or clearing vegetation around buildings or settlements.
Concerning recovery, generally, the ecological implications of wildfires are overwhelmingly positive in Sweden. For large incidents, natural reserves are sometimes formed to preserve fire-affected forests from being cut. Forestry companies can use wildfires to account for their prescribed burning for biodiversity reasons required for environmental certification of timber or paper pulp. The most important recovery actions are issued by the Forest Agency, which (i) controls the amount of dead wood in production forests to mitigate the risk of bark beetle outbreaks in fire-affected areas and (ii) guides on economically effective salvage logging.

2.12.2 FirEUrisk survey on Wildfire Management Policies (Sweden)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildfire Management Policies in Sweden

Sweden has a comprehensive set of policies and organizations dedicated to wildfire management. The responsibilities are divided among various entities, including local municipalities, national agencies, and landowners. Here is an extensive report based on the provided information and additional resources:

Organizations and Their Roles

1. **Municipalities**: There are 290 municipalities in Sweden, each responsible for responding to accidents and providing a suitable rescue service. They also prevent accidents by informing the public, helping people and organizations fulfil their responsibilities. Some municipalities share their rescue service for organizational purposes, and in total, there are 152 individual rescue services throughout Sweden.
2. **Swedish Civil Contingency Agency (MSB)**: Under the Justice Department, MSB helps with coordination and aerial support for very complicated incidents. MSB is also responsible for developing warning systems for different natural hazards, including forest and grass fires. They are also working on fuel mapping and recommendations.
3. **Landowners**: The organization, company, or person owning the land is responsible for restoration after an incident.
4. **SMHI - National Meteorological Institute**: Under the Environmental Department, SMHI calculates the fire danger classes every day on behalf of MSB.
5. **Forest Agency**: Under the Ministry of Trade and Industry, the Forest Agency issues the regulations for landowners on protocols after a fire.
6. **Länstyrelser (County Administrative Boards)**: Sweden is divided into 21 Counties. The Administrative board of a county is responsible for coordination between different municipalities and between municipalities and national authorities (MSB) for large incidents. They can also decide to take control of the response of an incident. They are also responsible for approvals on issues after an incident, such as the creation of natural reserves, etc.
7. **RescEU**: Sweden is a part of ResEU, and through this mechanism, Sweden can receive and provide resources for large incidents.

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Laws and Decrees

1. **LSO - Lagen om skydd mot olyckor (2003:778) (English: protection against accidents)**: MSB is responsible for supervising that organizations comply with the law. The law describes the responsibilities of the public, companies, and different public organizations in preventing accidents and in case an accident occurs.
2. **Brottsbalken, chap 2 (English: crime)**: The law dictates the liability of individuals that cause fires out of neglect or deliberately.
3. **Miljöbalken, chap 2 (English: Environmental law)**: The law dictates how threats to the environment should be avoided and how to restore land after accidents in accordance with the national environmental goals.

Investments

1. **National budget (state)**: MSB provides funds for the development of e.g., fuel maps and fire danger systems.
2. **National budget (state)**: Formas, a government research council for sustainable development, is funded from the national budget.
3. **EU Research & Innovation**: Provides funding for prevention, response, and restoration.
4. **Other (Private research funds)**: There are several research funds, often trade-specific, that deal with funding development of protocols, knowledge, and information transfer.

Additional Information

1. **Fire bans**: Each county administrative board is responsible for the information relating to fire bans in effect in the county's municipalities. There are two types of fire ban – fire bans and stringent fire bans. Information on the current fire bans can be found on the websites of the municipality or county administrative board (source).
2. **Satellite fire detection**: MSB, in collaboration with SMHI, county administrative boards, and municipal rescue services, has developed a system to detect fires using satellites. This system complements the existing forest fire monitoring aircraft and has proven to be highly beneficial for rescue services. The primary goal is to detect forest fires early and begin extinguishing efforts before the fires spread. The system has also been useful for locating fires, which can be challenging based on incoming reports (source).
3. **Controlled burns**: In certain situations, controlled burns are used as a preventive measure. For example, in Älvdalen, 800 hectares were set to be burned to prevent a larger wildfire. This was the largest controlled burn in Sweden to date. The goal of such burns is to remove all fuel from the area so that when a larger fire reaches the area, there is nothing left to burn, effectively stopping the fire (source).
4. **Fire safety guidelines**: The Swedish Civil Contingencies Agency (MSB) provides guidelines for lighting fires and the Right of Public Access. These guidelines include information on when and where to light fires, what to do if a fire spreads, and how to extinguish a fire safely (source).
5. **Climate change and forest fires**: While the annual burned area of the forest in Sweden has been relatively low, indicating efficient fire suppression policies, forest fires are expected to increase due to

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climate change. Preventive measures, including communicating restrictions regarding the lighting of fires and ensuring compliance with these restrictions, will become increasingly important. Fire monitoring will also continue to be a central task (source).

In conclusion, Sweden's wildfire management policies involve a combination of local and national entities, strict laws and decrees, and strategic investments. The country also leverages advanced technology, such as satellite fire detection, and implements preventive measures, such as controlled burns and fire bans, to manage and mitigate the risk of wildfires.

2.13 Wildfire management policies in CYPRUS

2.13.1 General status

In Cyprus approximately 66.970 ha (38%) of the forests are privately owned while 107.430 ha (62%) are public (Cyprus Ministry of Agriculture Natural Resources and Environment, Department of Forests and FAO 2005).

Prevention measures in Cyprus refer to the actions taken to reduce the risk of wildfires in forests and woodlands. These measures include using firebreaks, areas cleared of vegetation to create a barrier that can stop or slow down the spread of a fire. Fuel management involves reducing the amount of flammable material, such as dead leaves and branches, in an area to make it less susceptible to fires. Public education and awareness campaigns aim to inform people about the dangers of wildfires and how to prevent them.

Cyprus has a ban on outdoor burning during the summer months when the risk of wildfires is highest. This ban helps to reduce the number of fires caused by human activities, such as campfires and barbecues, which can quickly get out of control in dry and windy conditions. During the winter months, it is possible to obtain a permit for burning agricultural remains. However, this is not always done in practice.

Early detection is crucial in minimizing the size and impact of wildfires. Cyprus has invested in a network of fire towers and lookout stations, which are manned by trained personnel who can spot fires and alert the authorities. Aerial surveillance and satellite monitoring are also used to detect fires, especially in remote or inaccessible areas.

Suppression efforts in Cyprus are led by the Department of Forests, which coordinates the response to wildfires. Ground-based resources, such as firefighters and fire engines, are used to contain and extinguish fires. Aerial firefighting resources, such as helicopters and water bombers, are also deployed to drop water or fire retardant on the flames. The choice of resources depends on the size and location of the fire, as well as the weather conditions.

Post-fire recovery efforts in Cyprus focus on restoring damaged ecosystems and preventing erosion and other negative impacts. The Department of Forests works with other agencies and stakeholders to assess the extent of the damage and develop a plan for rehabilitation. This may involve planting new trees and vegetation,

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stabilizing the soil, and controlling invasive species. Research and monitoring are also conducted to evaluate the effectiveness of wildfire management policies and practices, and to identify areas for improvement.

At the national level, the main legislation governing forest fire management in Cyprus is the Forest Law (Law 86(I)/2012), which sets out the rules and guidelines for the management and protection of forests in Cyprus. The law establishes the responsibilities of different actors involved in forest management, including the Forest Department, which is responsible for the management of state-owned forests, and private forest owners, who are responsible for the management of their own forests.

The Civil Defence Law (Law 2(I)/2007) also plays an important role in forest fire management in Cyprus. The law regulates the organization and management of civil protection and rescue activities in Cyprus, including forest fire management. It sets out the roles and responsibilities of different actors involved in emergency management, including the Civil Defence Force, which is responsible for coordinating firefighting activities at the national level, and regional and local authorities, which are responsible for coordinating firefighting activities at the regional and local levels. In terms of organizational structure, Cyprus's forest fire management system is complex and involves many different actors and organizations at the national, regional, and local levels. The Forest Department is responsible for the management of state-owned forests and for implementing forest fire management policies and measures. The Fire Service is responsible for coordinating firefighting in periurban areas while Civil Defense is in charge of rescue operations during emergencies. Regional and local authorities are responsible for supporting firefighting activities at the regional and local levels. In Cyprus, various civil society volunteer groups are actively involved in forest firefighting. However, their efforts are not effectively coordinated at present.

2.13.2 FirEUrisk survey on Wildfire Management Policies (Cyprus)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildfire Management Policies in Cyprus

Organizations Involved in Wildfire Management

1. **Cyprus Fire Service**: Under the Ministry of Justice, this organization operates at a national level, focusing on prevention and restoration, particularly in structures within Wildland-Urban Interface (WUI) areas.
2. **Cyprus Forest Department**: Also, under the Ministry of Justice, this organization operates at a national level, focusing on prevention, response, and restoration in WUI and up to 1km around those areas.
3. **Civil Protection**: This organization supports the Fire Service and the Forest Department in executing evacuations. It operates at a national level, focusing on prevention and restoration.
4. **Police**: The police provide support to the Fire Service and the Forest Department, managing the road network and working with Civil Protection for evacuations.

Laws and Decrees

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1. **Forest Law 2012**: Applied by the Cyprus Forest Department, this law includes national forest policies and national forest programs, land and forest management, Natura 2000 policies, private forests, and penalties for fires, tree cutting, or causing damage in forests.
2. **Criminal Law (chapter 154)**: Applied by the Cyprus Police, this law imposes penalties for causing or attempting to cause fires in buildings, vehicles, private or public forests, ores, crops.
3. **Fire Service Law 2021**: This law defines all aspects of the operation of the Cyprus Fire Service. The CFS is not responsible for forest fires but operates alongside the Forest Department when requested.
4. **Rural Fires prevention law 1988**: This law defines and describes all actions, operations, responsibilities of the local services and authorities when a rural (non-urban area) fire erupts.

Policies

1. **Fire**: Under the Ministry of Interior, this policy named "Rules for Fire Protection" is part of The Law for the design of streets and buildings.
2. **Land planning**: A policy regarding the construction of isolated structures in forest areas is in place. Permits to build isolated structures are issued by the relevant land planning authorities of the Ministry of Interior.
3. **Forest**: A policy is in place where owners are required to apply for a permit to burn dead vegetation in their properties. Permits are issued by the Forest Department or the local authorities during the winter months when fire risk is low.

Investments

1. **National budget (state)**: State budget for all fire-related events, the operation of the government authorities.
2. **European Recovery Fund**: Cyprus has included fire prevention and fighting equipment in the European Recovery Fund application for 2021-26.
3. **EU Research & Innovation**: The three services are partners in various EU projects related to fire prevention, management, first responders, research for future policies etc.
4. **European Structural & Investment Fund**: Funding for the leasing of firefighting airplanes and helicopters.

Additional Information

The Cyprus Forest Department is responsible for the management of state forests for the benefit of the environment and the rural population. The department's activities include forest protection, afforestation, management of state forests, provision of services to the rural population, wildlife management, and the enforcement of forest legislation.

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The Cyprus Fire Service is responsible for firefighting in urban areas and provides assistance to the Forest Department in fighting forest fires. The Fire Service also provides rescue services in cases of natural disasters and accidents.

The Civil Protection Department is responsible for coordinating actions to prevent and respond to natural and man-made disasters. The department works closely with the Fire Service, the Forest Department, and other agencies to ensure a coordinated response to wildfires.

The Police assist in wildfire management by enforcing laws related to fire prevention, providing support to firefighting operations, and managing road networks during wildfires.

2.14 Wildfire management policies in GERMANY

2.14.1 General status

Wildfire management policy in Germany is the responsibility of multiple organisations at different federal levels of government. At the federal level, the Federal Ministry of Food and Agriculture is responsible for developing and implementing policies related to wildfire management. The Federal Office for Agriculture and Food (BLE) and the Thünen Institute (Federal Research Institute for Rural Areas, Forestry and Fisheries) provide scientific and technical support to the Federal Ministry of Food and Agriculture (BMEL). At the state level, each of Germany's 16 federal states responsibilities for wildfire are always shared between the state forestry administrations and the ministries for civil protection. These agencies are typically located within the state forestry departments and are responsible for implementing wildfire prevention and suppression measures. The state agencies also coordinate emergency responses to wildfires. For example, the State Ministry of Food, Agriculture, and Forestry in Bavaria is responsible for wildfire management in Bavaria. The State Agency for Nature, Environment, and Consumer Protection coordinates wildfire prevention and suppression efforts in North Rhine-Westphalia. The division of responsibilities between federal and state agencies allows for a coordinated and efficient approach to wildfire management in Germany.

On a daily basis, the German Weather Service produces forecasts of fire danger for both forests, utilizing a modified version of the Canadian Forest Fire Weather Index, referred to as the *Waldbrandindex*, and for grasslands, utilizing the Grassland Fire Index.

In the event of a wildfire, the primary responders are the local fire brigade responsible for the affected communities. Additional support may be requested from nearby communities if necessary. If the situation escalates to an unmanageable level, the next level of authority (the district or "Kreis" in German) may declare a catastrophe alert and request assistance from the state police (*Landespolizei*), federal police (*Bundespolizei*), military (*Bundeswehr*), and the Federal Agency for Technical Relief (THW).

In Germany, forest fire management policies are regulated by national and regional legislation and are implemented by various government agencies and organizations.

At the national level, the main legislation governing forest fire management in Germany is the Federal Forest Act (*Bundeswaldgesetz*), which sets out the rules and guidelines for managing and protecting forests in Germany. The act establishes the responsibilities of different actors involved in forest management, including

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the Federal Ministry of Food and Agriculture, which is responsible for managing federal forests, and private forest owners, who are responsible for managing their own forests.
The Civil Protection Act (*Zivilschutzgesetz*) also plays an important role in forest fire management in Germany. The act regulates the organization and management of civil protection and rescue activities in Germany, including forest fire management. It sets out the roles and responsibilities of different actors involved in emergency management, including the Federal Agency for Technical Relief (*Technisches Hilfswerk*), which is responsible for coordinating firefighting activities at the national level, and regional and local authorities, which are responsible for coordinating firefighting activities at the regional and local levels. In the event of an emergency, the Technical Relief Agency (THW) can provide practical and technical aid. The Federal Office of Civil Protection and Disaster Assistance is the governing body tasked with supplying civil protection and alerts. Forest fire fighting is primarily the responsibility of the local fire departments, which are organized at the municipal level. These fire departments are typically staffed by volunteer firefighters who occasionally receive specialized training in forest firefighting techniques. In addition to the local fire brigades, other organizations may also be involved in forest fire fighting in Germany, depending on the size and severity of the fire.
The German Armed Forces, specifically the Joint Support Service (*Streitkräftebasis*), also play a role in forest fire fighting. They have specialized firefighting units and equipment that can be deployed to assist in firefighting operations when needed.
At the regional level, each of Germany's 16 states has its own legislation and policies for forest fire management, which must comply with the national legislation. These regional laws establish the specific measures and responsibilities for preventing and fighting forest fires in each region, considering the local climate, terrain, and vegetation types.
In terms of organizational structure, Germany's forest fire management system is complex and involves many different actors and organizations at the national, regional, and local levels. Regional and local authorities are responsible for coordinating firefighting activities at the regional and local levels.

2.14.2 FirEUrisk survey on Wildfire Management Policies (Germany)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildfire Management Policies in Germany

Germany's wildfire management policies are primarily implemented at the regional level, with a focus on prevention measures. The country's approach to wildfire management is characterized by a combination of legal regulations, technological solutions, and strategic planning.

Organizational Structure

1. ***Sachsenforst***: This organization operates under the Federal State of Saxony and focuses exclusively on prevention measures. It classifies forest fire hazard levels based on historical data, forest structures, and climatic conditions. The areas with the highest risk of forest fire are in the northern part of Saxony due to low annual rainfall, water-permeable sandy soils, and large-scale, highly ignitable pine stands.
2. **Integrated Regional Control Center East Saxony and AWFS headquarters in Eilenburg**: This organization is responsible for responding to wildfires. It processes smoke reports from 17 cameras

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installed in Saxony and passes on the information to the fire protection, rescue, and disaster control centers.

3. **Firewatch System - Wildfire Centre (*Waldbrandzentrum*)**: This organization, under the Ministry of Rural Development, Environment and Agriculture of the State of Brandenburg, has installed 106 cameras with a range of 20km to detect fires and relay the images to the Wildfire response Centre.
4. **DWD Deutsche Wetterdienst (German Weather Service)**: This national organization provides daily updates on fire risk based on weather and vegetation conditions.

Legal Framework

Germany's wildfire management policies are enforced through a series of laws and decrees, including:

1. **SächsWaldG**: This law restricts certain activities related to fire risk in the proximity of a forest, irrespective of Fire Risk Level.
2. **SächsWaldG**: This law prohibits motorized vehicle use in forests, with the exception of forestry activities.
3. **SächsWaldG**: This law allows the closure of a forest for a number of reasons including heightened fire risk.
4. **SächsWaldG**: This law requires forest owners to prevent the risk of significant damage to the forest through natural events, forest fires, etc.
5. **SächsWaldG**: This law empowers the forest authority to order the necessary protective measures to prevent forest fires and the dangers of natural events.
6. **SächsWaldG**: This law allows the declaration of a forest for recreational purposes. Regulations on the behaviour of visitors must be issued.
7. **SächsWaldG**: This law specifies fines for offenses related to fires, smoking, and negligence.
8. **LWaldG**: This law allows a forest to be made 'off-limits' or closed for forest protection.
9. **LWaldG**: This law mandates preventive forest fire protection such as the construction and maintenance of forest fire protection strips, forest fire protection bars, or extinguishing water extraction points.
10. **LWaldG**: This law provides a subsidy from the state for reforestation costs incurred due to forest fire damage.
11. **LWaldG**: This law allows the highest forest authority to divide the forest areas of the state into forest fire hazard classes.
12. **Section 23 LWaldG**: This law restricts the use of fire in and within 50m of a forest.
13. **Section 37 LWaldG**: This law imposes fines for not fulfilling the obligations for preventive forest fire protection.

Investments

Investments in wildfire management in Germany are made at both the national and regional levels. The specific details of these investments are not provided in the given information.

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RecentDevelopments

Unfortunately, we were unable to find recent developments in wildfire management policies in Germany. However, it's important to note that Germany's approach to wildfire management is continually evolving to address the changing climate and the increasing risk of wildfires. The country's focus on prevention measures, technological solutions, and strategic planning helps to mitigate the impact of wildfires and protect both people and ecosystems.

2.15 Wildfire management policies in FINLAND

2.15.1 General status

In Finland, forest fire management policies are regulated by national and regional legislation and are implemented by various government agencies and organizations.

The Finnish Forest Centre (FFC) operates under the guidance of the Ministry of Agriculture and Forestry and is responsible for preventing and controlling forest fires in Finland. Its responsibilities include organizing and coordinating the country's prevention and control of forest fires and conducting fire risk assessments to identify areas vulnerable to forest fires. The FFC develops fire prevention plans to reduce the risk of forest fires and trains personnel to respond to forest fires effectively. It also provides guidance and support to regional authorities to prevent and control forest fires.

The Finnish Meteorological Institute provides weather forecasts that are critical in preventing and responding to forest fires. It also calculates the daily forest fire risk map and provides forest fire warnings and alerts.

The Forest Act (1093/1996) and the Forest Fires Act (607/2011) regulate wildfire prevention in Finland. The Forest Act sets out the general framework for forest management in Finland, including provisions related to forest fires while the Forest Fires Act is more specific to wildfire prevention and management.

At the national level, the main legislation governing forest fire management is the Forest Act (*Laki metsistä*), which sets out the rules and guidelines for the management and protection of forests in Finland. The act establishes the responsibilities of different actors involved in forest management, including the Finnish Forest Board *Metsähallitus*, which is responsible for managing state-owned forests, and private forest owners, who are responsible for managing their own forests but are supported in this by the Finnish Forest Centre (*Metsäkeskus*). The Ministry of the Interior is responsible for overall preparedness and coordination of rescue services, including forest fire management. The Ministry collaborates closely with the Finnish Environment Institute, the Finnish Meteorological Institute, and other stakeholders to prevent and manage forest fires.

The Rescue Act (*Pelastuslaki*) also plays an important role in forest fire management in Finland. The act regulates the organization and management of rescue activities in Finland, including forest fire management. It sets out the roles and responsibilities of different actors involved in emergency management, including the Finnish Department of Interior's Rescue Services Department, responsible for coordinating firefighting activities at the national level, and regional and local authorities, responsible for coordinating firefighting activities at the regional and local levels.

At the regional level, each of Finland's 21 regions has its own legislation and policies for forest fire management, which must comply with the national legislation. These regional laws establish the specific

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measures and responsibilities for preventing and fighting forest fires in each region, taking into consideration the local climate, terrain, and vegetation types.
In terms of organizational structure, Finland's forest fire management system is complex and involves many different actors and organizations at the national, regional, and local levels. The Finnish Forest Centre is responsible for advising on forest fire management policies and measures. The Finnish Ministry of Interior's Rescue Services Department coordinates firefighting and rescue operations during emergencies. Regional and local authorities are responsible for coordinating firefighting activities at the regional and local levels. They also host and equip firefighting crews and coordinate their operations with voluntary firefighting crews. Municipalities and other responsible parties must establish and maintain fire protection plans for vulnerable areas, such as forests and peatlands.

2.15.2 FirEUrisk survey on Wildfire Management Policies (Finland)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildfire Management Policies in Finland

Introduction

Finland, a country known for its vast forests and low population density, has a comprehensive wildfire management policy in place. The country's wildfire management is handled by several organizations at the national, regional, and local levels. These organizations are responsible for prevention, response, and restoration efforts related to wildfires.

Organizations Involved in Wildfire Management

1. Ministry of the Interior

The Ministry of the Interior is a national-level organization that is inclusive in both prevention and response to wildfires. However, it does not play a role in the restoration process. More information can be found on their website.

2. Regional State Administrative Agency

The Regional State Administrative Agency operates at the regional level and is inclusive in prevention efforts. It exclusively handles the response to wildfires but does not involve itself in the restoration process. More details can be found on their website.

3. Rescue Departments

There are 22 local rescue departments in Finland that are inclusive in prevention, response, and restoration efforts related to wildfires. More information can be found on their website.

Laws and Decrees

1. Rescue Act (379/2011)

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The Rescue Act (379/2011) is applied by the Ministry of the Interior at the national level. It is inclusive in prevention, response, and restoration efforts related to wildfires.

2. Instructions by the Regional State Administrative Agency

The Regional State Administrative Agency provides instructions at the national level that are inclusive in prevention and response efforts. However, these instructions are exclusive to the restoration process.

3. Instructions by the Rescue Departments

The local rescue departments provide instructions that are inclusive in prevention and response efforts but are exclusive to the restoration process.

Policies

The Civil Protection policy is applied by the Ministry of the Interior, the Regional State Administrative Agency, and the local rescue departments. However, the application level and the specific roles in prevention, response, and restoration are not specified in the provided data.

Investments

1. National Budget (State)

The national budget, applied by the Ministry of the Interior, is inclusive in prevention and response efforts but does not include restoration.

2. Regional Budget (State)

The regional budget, applied by the Regional State Administrative Agency, is inclusive in prevention and response efforts but does not include restoration.

3. Regional Budget (State)

The regional budget, applied by the local rescue departments, is inclusive in prevention and response efforts but is exclusive to the restoration process.

Finland's wildfire management policy is comprehensive, involving multiple organizations at various levels. The country places a strong emphasis on prevention and response, with some organizations also involved in restoration efforts. The policy is supported by national and regional budgets, ensuring that the necessary resources are available for effective wildfire management.

2.16 Wildfire management policies in the United Kingdom (U.K).

2.16.1 General status

In the UK, wildfire is a devolved matter across the home nations of England, Wales Scotland and Northern Ireland. Within each nation, management policy is the responsibility of a single department but requires the output of multiple departments at different levels.

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For example, in England, the Home Office is the Lead Government Department for wildfire risk. As part of the Wildfire Framework for England other departments also have roles. For instance, the Department for Environment, Food, and Rural Affairs (DEFRA) has a role for developing policies and legislation related to wildfire management at the national level. DEFRA provides guidance and support to land managers to better manage wildfire risks.

At the local level, fire and rescue services (FRS) are responsible for responding to and managing wildfires. Fire and rescue services work closely with local authorities, landowners, and other organizations to prevent and manage wildfires in their areas. Wildfires are covered in the relevant Fire and Rescue Services Act in the home nation.

Several non-governmental organizations (NGOs) in the UK are involved in wildfire management, such as the Wildfire Trust and the Moors for the Future Partnership. The Wildfire Trust promotes DEFRA and Forestry Commission wildfire prevention and management, while the Moors for the Future Partnership focuses on restoring moorlands and reducing the risk of wildfires in those areas.

There is currently no legislation for forest fires in all parts of the UK. The only legislation is in the Fire and Rescue Services Act (2004) that is now applicable only to England, whereas legislation has changed in Wales and Scotland to fit their devolved needs.

Fire safety regulations are designed to prevent fires from occurring and help ensure that people are safe in the event of a fire. However, in England for example the RRO (Fire Safety) 2005, excludes fields and woods and it therefore cannot be used for wildfire prevention.

Local fire and rescue services, who are part of each country's fire and rescue service, are responsible for coordinating firefighting activities at the local levels. There are currently 44 FRS in England, 3 in Wales, 1 in Northern Ireland and 1 in Scotland. Each FRS addresses wildfire differently.

Thus, wildfires are 'covered' (under the term 'fire') in the relevant devolved Fire and Rescue Services Acts for England & Wales, Scotland and Northern Ireland. That means, for example, in England there are 44 separate and uncoordinated approaches to wildfire prevention and response. However, strategies in Wales, Scotland and Northern Ireland seek to provide a much more effective and cohesive response across FRS and land managers than in England.

2.16.2 FirEUrisk survey on Wildfire Management Policies (U.K.)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildland fire management policies are crucial in preventing, responding to, and restoring areas affected by wildfires. This report provides an overview of the wildland fire management policies in the United Kingdom, focusing on the four nation-states: England, Scotland, Wales, and Northern Ireland. The policies and responsibilities of various organizations at the regional and national levels are outlined, along with the legislative frameworks and investment sources for wildfire prevention, response, and restoration.

1. Fire and Rescue Services (44 England and 3 Wales)

Ministry: Home Office

Level: Regional

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Prevention: YES

Response: NO

Restoration: N/A

The Fire and Rescue Services in England (44 services) and Wales (3 services) are responsible for wildland fire prevention and response. The Home Office oversees these services. While they have a role in fire prevention, their primary responsibility is responding to wildfires. The restoration of affected areas is the responsibility of the relevant organization owning or managing the land.

2. Fire and Rescue Services Northern Ireland

Ministry: Northern Ireland Department of Health, Social Services and Public Safety

Level: Regional

Prevention: YES

Response: NO

Restoration: N/A

In Northern Ireland, the Fire and Rescue Services are responsible for wildland fire prevention and response. The Northern Ireland Department of Health, Social Services and Public Safety oversees these services. Similar to England and Wales, the restoration of fire-affected areas lies with the relevant organization owning or managing the land.

3. Scottish Fire and Rescue Services

Ministry: Cabinet Secretary for Justice in the Scottish Government

Level: Regional

Prevention: YES

Response: NO

Restoration: N/A

The Scottish Fire and Rescue Services are responsible for wildland fire prevention and response in Scotland. The Cabinet Secretary for Justice in the Scottish Government oversees these services. Restoration efforts after wildfires are the responsibility of the relevant organization owning or managing the land.

4. Department for Environment, Food & Rural Affairs - England

Ministry: Department for Environment, Food & Rural Affairs

Level: Regional

Prevention: YES

Response: YES

Restoration: YES

The Department for Environment, Food & Rural Affairs (DEFRA) in England is responsible for wildland fire prevention, response, and restoration. DEFRA plays a significant role in managing wildfires in England, including the restoration of fire-affected areas.

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5. Department of Levelling Up, Housing and Communities - England
Ministry: Department of Levelling Up, Housing and Communities
Level: Regional

Prevention: YES

Response: N/A

Restoration: YES

The Department of Levelling Up, Housing and Communities in England contributes to wildfire prevention and restoration efforts. However, it does not have a specific response role. The restoration of fire-affected areas is part of their responsibility.

6. Department for Transport

Ministry: Department for Transport

Level: Regional

Prevention: YES

Response: N/A

Restoration: YES

The Department for Transport in England also plays a role in wildfire prevention and restoration. It does not have a direct response role but focuses on ensuring transportation-related aspects during fire incidents.

7. Ministry of Defence

Ministry: Ministry of Defence

Level: National

Prevention: YES

Response: N/A

Restoration: YES

The Ministry of Defence in the UK has a national-level responsibility for wildland fire prevention and restoration. While it does not directly respond to wildfires, it is involved in supporting restoration efforts.

8. Business, Energy and Industrial Strategy

Ministry: Department for Business, Energy and Industrial Strategy

Level: Regional

Prevention: YES

Response: N/A

Restoration: YES

The Department for Business, Energy and Industrial Strategy in England contributes to wildfire prevention and restoration efforts. It does not have a specific response role but focuses on addressing the impacts of wildfires on business, energy, and industrial sectors.

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9. Natural Resources Wales

Ministry: Welsh Assembly Government

Level: Regional

Prevention: YES

Response: N/A

Restoration: N/A

Natural Resources Wales, under the Welsh Assembly Government, is responsible for wildfire prevention in Wales. However, it does not have a direct role in response or restoration efforts, which fall under the responsibility of the relevant land-owning or managing organizations.

10. Scottish Forestry

Ministry: Scottish Government

Level: Regional

Prevention: YES

Response: N/A

Restoration: YES

Scottish Forestry, under the Scottish Government, is responsible for wildfire prevention and restoration in Scotland. While it does not have a direct response role, it actively contributes to restoration efforts.

11. Scottish Government

Ministry: Scottish Government

Level: Regional

Prevention: YES

Response: N/A

Restoration: YES

The Scottish Government has a regional-level responsibility for wildfire prevention and restoration in Scotland. It works alongside other organizations to ensure effective prevention measures and restoration of fire-affected areas.

Legislation and Policies

1. Fire and Rescue Services Act 2004

Applied by (Service): Fire and Rescue Services

Level: Regional

Prevention: YES

Response: NO

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Restoration: N/A

The Fire and Rescue Services Act 2004 applies to Fire and Rescue Services in England and Wales. It provides a legislative framework for their roles in fire prevention and response.

2. Civil Contingencies Act (2004)

Applied by (Service): Fire and Rescue Services

Level: National

Prevention: YES

Response: NO

Restoration: N/A

The Civil Contingencies Act (2004) applies to Fire and Rescue Services in England. It establishes a legal framework for their response to emergencies, including wildfires.

Investment Sources

1. Regional budget (state)

Applied by: Fire and Rescue Services and other relevant organizations

Level: Regional

Prevention: YES

Response: NO (Fire and Rescue Services)

Restoration: N/A (Fire and Rescue Services), YES (other organizations)

The regional budgets, funded by national and/or regional sources, contribute to wildfire prevention, response, and restoration efforts. Fire and Rescue Services, as well as other relevant organizations, utilize these funds for their respective responsibilities.

2. Levy on local council tax

Applied by: Fire and Rescue Services (England)

Level: Regional

Prevention: YES

Response: NO

Restoration: N/A

Fire and Rescue Services in England receive funding through a small local council tax levy known as a precept. This additional funding supports their efforts in fire prevention and response.

In conclusion, wildland fire management policies in the United Kingdom involve multiple organizations at both regional and national levels. While the specific responsibilities and approaches vary across the four nation states, fire prevention has an inclusive focus. Response and restoration responsibilities primarily lie with the relevant organizations owning or managing the land.

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2.17 Wildfire management policies in Ukraine

2.17.1 General status

At the national level, the main legislation governing forest fire management in Ukraine is the Forest Code of Ukraine (*Кодекс України про ліси*), which sets out the rules and guidelines for the management and protection of forests in Ukraine. The code establishes the responsibilities of different actors involved in forest management, including the State Forest Resources Agency of Ukraine (*Державне агентство лісових ресурсів України*), which is responsible for the management of state-owned forests, and private forest owners, who are responsible for the management of their own forests. State Strategy on Integrated Landscape Fire Management in Ukraine developed (GFMC/REEFMC) for 2021-2025 together with Ministry of Environment Protection and Natural Resources of Ukraine (not approved due to war) https://nubip.edu.ua/sites/default/files/u184/proiekt_derzhavna_strategiya_upravlinnya_landshaftnimi_pozhezhami.pdf

The State Agency of Forest Resources of Ukraine, also known as *Derzh-Lisagentstvo*, is a central executive authority responsible for managing Ukraine's forests and preventing wildfires. The agency is responsible for implementing the state policy in forestry and hunting, conservation and restoration of forests, the rational use and protection of forests, and ensuring the sustainable development of state-owned forests. To prevent forest fires, the agency develops and implements forest fire prevention plans and programs, conducts forest patrols, establishes firebreaks, and monitors forest fires. During wildfire response efforts, the agency works closely with the State Emergency Service of Ukraine (SESU) to manage the situation effectively. In Ukraine forestry and forest fire stations all over the country responsible for detection, prevention and initial attack. If fire grows more 50 ha other Agencies (State Emergency Service of Ukraine (SESU), National Police, Army) may provide resources to help cope the fire.

While other organizations, such as local fire departments and civil society groups, also play a role in forest fire prevention and response efforts, *Derzh-Lisagentstvo* is the primary organization responsible for managing these activities nationwide.

The Law of Ukraine on Civil Protection (*Закон України "Про цивільний захист*) also plays an important role in forest fire management in Ukraine. The law regulates the organization and management of civil protection and rescue activities in Ukraine, including forest fire management. It sets out the roles and responsibilities of different actors involved in emergency management, including the State Emergency Service of Ukraine (*Державна служба з надзвичайних ситуацій України*), which is responsible for coordinating firefighting activities at the national level, and regional and local authorities, which are responsible for coordinating firefighting activities at the regional and local levels.

Ukraine has been taking significant steps to improve its wildfire management strategies, especially after the catastrophic year of 2020. In May 2020, a new National System of Fire Weather Danger was developed, with daily maps and a three-day forecast published on the national meteorological website. Further strengthening the country's fire management capabilities, in May 2022, the Cabinet of Ministers of Ukraine approved a new

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Order of Fire and Pest Management in Forests. This order mandates obligatory training for firefighters before they are allowed to combat fires. A National Fire Management Center was also opened in Desna village to centralize and streamline the country's fire management efforts.

However, the ongoing Russian military invasion has posed significant challenges to fire management in eastern and southern Ukraine. The conflict has contaminated approximately 600,000 hectares of forests by unexploded ordnance (UXO), severely limiting fire management activities in these areas. The State Service of Emergencies of Ukraine (SESU) estimates that it will take at least seven years to clear the forests of UXO. National security concerns have also led to fire detection cameras, fire aviation, and forest patrolling restrictions. The transfer of fire pickup trucks to the army and enlisting many foresters in the military has further weakened the country's fire management capabilities.

Climate change has also had a significant impact on Ukraine's fire situation, with major fires in 2015 and 2020 resulting in the loss of more than 160,000 hectares of pine forests, impacting 22 villages, and causing 17 fatalities and 54 injuries. Despite these challenges, Ukraine has tried to replant all lost forests, ensuring no net forest loss. The establishment of the National Forest Company "Forests of Ukraine" in December 2022, although making fire management more difficult due to the increased size of forestry units, signifies the country's commitment to forest conservation and management.

At the regional level, each of Ukraine's 24 oblasts has its own legislation and policies for forest fire management, which must comply with the national legislation. These regional laws establish the specific measures and responsibilities for preventing and fighting forest fires in each oblast, considering the local climate, terrain, and vegetation types.

Regarding organizational structure, Ukraine's forest fire management system is complex and involves many different actors and organizations at the national, regional, and local levels. The State Forest Resources Agency of Ukraine is responsible for the management of state-owned forests and for implementing forest fire management policies and measures. The State Emergency Service of Ukraine is responsible for coordinating firefighting and rescue operations during emergencies. Regional and local authorities are responsible for coordinating firefighting activities at the regional and local levels.

2.18 Wildfire management policies in The Netherlands

2.18.1 General status

Netherlands has a low wildfire risk due to its climate and landscape, which has resulted in very little development of wildfire management policies and strategies. There are few natural forests in the country, and wildfires are rare occurrences. As such, there is no dedicated wildfire management organization in the Netherlands.

However, the country has recognized the potential risks of climate change and the increasing threat of wildfires in other parts of Europe and has taken some measures to be prepared for potential wildfire incidents. The Dutch government invests in training and equipping firefighters to respond to wildfires, and in 2019, the Dutch Forestry Commission launched a new initiative aimed at preventing wildfires in the country's nature reserves.

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Regarding legislative framework, the Netherlands has no specific laws related to wildfire prevention and management but rather incorporates wildfire into broader legislation on nature conservation and environmental protection. The primary responsibility for wildfire prevention and management lies with the regional fire services, which work in coordination with other stakeholders, such as the Dutch Forestry Commission and local authorities.
Thus, while the Netherlands does not face significant wildfire challenges, it has taken some measures to prepare for potential incidents and has recognized the need to adapt to the changing climate. Nonetheless, the country has minimal specific legislation and organizational framework concerning wildfire management.

2.18.2 FirEUrisk survey on Wildfire Management Policies (Ukraine)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.
Wildfire management policies in Ukraine

The structure of wildfire organization in Ukraine is based on the following organizations:

1. **State Agency of Forest Resources of Ukraine (SAFRU)**: Under the Ministry of Environment Protection and Natural Resources of Ukraine (MENR), SAFRU operates at the national level and is exclusively responsible for prevention and restoration efforts related to wildfires. It also plays an inclusive role in response efforts. More information can be found on their official website.
2. **State Service of Emergencies of Ukraine (SESU)**: This agency is under the Ministry of Internal Affairs of Ukraine (MIA) and operates at the national level. It plays an inclusive role in response efforts to wildfires. More details can be found on their official website.
3. **State Agency on Exclusion Zone**: This agency is also under the Ministry of Internal Affairs of Ukraine (MIA) and operates at the regional level. It is exclusively responsible for prevention, response, and restoration efforts related to wildfires.
4. **Ministry of Environment Protection and Natural Resources of Ukraine (MENR)**: MENR operates at the national level and is exclusively responsible for prevention and response efforts related to wildfires.

The following laws and decrees are applied in Ukraine for wildfire management:

1. **Forest Code of Ukraine**: Applied by SAFRU at the national level, this code exclusively covers prevention, response, and restoration efforts related to wildfires.
2. **Code of Civil Protection of Ukraine**: Applied by SESU at the national level, this code plays an inclusive role in response efforts to wildfires.
3. **Rules of Fire Safety in Forest of Ukraine**: Applied by SAFRU at the national level, this code exclusively covers prevention and response efforts related to wildfires.

The following policies are applied in Ukraine for wildfire management:

1. **Forest Policy**: Applied by the Ministry of Environment Protection and Natural Resources of Ukraine (MENR) at the national level, this policy exclusively covers prevention and restoration efforts related to wildfires. It also plays an inclusive role in response efforts.

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2. **Climate Policy**: Applied by MENR at the national level, this policy exclusively covers prevention, response, and restoration efforts related to wildfires.
3. **Fire Policy**: Applied by the Ministry of Internal Affairs of Ukraine (MIA) at the national level, this policy plays an inclusive role in prevention and response efforts related to wildfires.
4. **Civil Protection Policy**: Applied by MIA at the national level, this policy exclusively covers prevention and response efforts related to wildfires.
5. **Land Planning Policy**: Applied by local authorities at the local level, this policy plays an inclusive role in prevention, response, and restoration efforts related to wildfires.

In terms of investment, SAFRU is responsible for applying funds at the national level for exclusive prevention, response, and restoration efforts related to wildfires.

2.18.3 FirEUrisk survey on Wildfire Management Policies (Netherlands)

Here next follows more detailed information from the data gathered through the FirEUrisk Questionnaire.

Wildfire Management Policies in the Netherlands

The Netherlands has a comprehensive and well-structured system for managing wildfires. The system involves several organizations and policies that work together to prevent, respond to, and restore areas affected by wildfires.

Organizations Involved in Wildfire Management

1. **Ministry of Defence**: The Ministry of Defence plays a crucial role in the response to wildfires at the national level.
2. **Landbouw, Natuur en Voedselveiligheid (LNV) - Agriculture, Nature and Food Safety**: This national-level ministry is exclusively responsible for the prevention of wildfires.
3. **Brandweer Nederland (IFV) - Fire Brigade Netherlands**: Established by law as an independent administrative body, the Fire Brigade Netherlands is exclusively responsible for responding to wildfires. They also offer classes and coursework on response.
4. **Staatsbosbeheer - Forestry Commission**: This national organization has an inclusive role in both the prevention of wildfires and the restoration of areas affected by wildfires. Their scope includes research, conservation, and restoration.
5. **Safety Regions**: The Netherlands is divided into 25 so-called 'Safety Regions' (*veiligheidsregio's*), a decentralized level of government, which are in charge of the fire brigade and the emergency medical care for their territory. They are responsible for drawing up joint regulations for crisis management and for administering the emergency services in their respective region. [1]

Key Policies and Laws

1. **Safety Region's Act (2010)**: This national law replaces the Disaster and Heavy Accidents Act, the Act on Medical Assistance in Times of Disaster, and the Fire Service Act of 1985. It establishes the 25 safety regions for the Netherlands through which wildfire response is managed.

Investments and Programs

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1. **Bosbrandverordening' program (1945-2002)**: This program was run by *Staatsbosbeheer* (The Dutch national forestry department) and supported Dutch landowners in making their properties less susceptible to fire risk. The program was abandoned in 2002 as data indicated fire was decreasing.
2. **Visie Natuurbrandbeheersing**: This is an integrated approach to prevent and combat future wildfires being developed by the Dutch Fire Brigade (*Brandweer*).

3 Conclusions

The aim of the present report was to disseminate the findings of the FirEUrisk project, which focused on investigating the European institutions, policies, and laws that govern the management of wildland fires. The objective was to gain insights into the diverse approaches adopted by different countries in addressing this issue, and to evaluate the efficacy of policies in mitigating the impact of these fires. Drawing on the feedback obtained through the FirEUrisk questionnaires on forest and fire management in Northern and Southern EU countries, we have formulated certain conclusions.

Forest management in Northern EU countries, like Sweden and Finland, prioritize fire prevention, whereas Southern EU countries, such as Greece and Portugal, focus on managing forest fires through their fire service. There are notable differences in forest and fire service management approaches and organization between Northern and Southern EU countries, which can have significant impacts on the prevention and management of forest fires.

Different countries have varying approaches to managing wildfires. For instance, Portugal, Spain, and Greece, which have high wildfire risks, have more comprehensive regulations and requirements for preventing wildfires. On the other hand, countries with lower wildfire risks like Denmark, Sweden, and the Netherlands concentrate on general forest management practices, education, and awareness campaigns to encourage responsible behavior.

Upon thorough analysis of feedback received, it has been established that regional policies for wildfire management in the EU can be categorized into five distinct regions, namely Southern Europe, Eastern Europe, Central Europe, North-West (Atlantic) Europe, and Northern Europe. Although there exists heterogeneity among member states, numerous countries have implemented comparable measures and best practices for wildfire prevention that rely on technological capabilities such as early warning systems, firefighting equipment, and public education and awareness campaigns. This is of paramount importance as the adoption of similar measures and best practices can considerably enhance the efficacy of wildfire prevention efforts across diverse regions and countries.

Despite the longstanding engagement of humans with fire, the majority of focus has been directed towards the destructive potential of fire rather than its role in shaping landscapes (Vecchio, 1974; Leone and Lovreglio, 2003). It is incumbent upon E.C. to gain a thorough understanding and recognition of the ecological significance of forest fires, and to integrate this knowledge into formalized wildfire management plans across Europe. Rather than imposing strict limitations, which may potentially exacerbate climate change and wildfire pattern changes, it is essential to consider the incorporation of this valuable knowledge (Ribet, 2002).

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The Cardiff process, mentioned in this document, addressed various issues related to civil protection, including forest fires. However, given the increasing frequency and severity of forest fires in E.U., particularly in the context of climate change, there may be a need for a new initiative or process to address these challenges. Such an initiative could focus specifically on the impacts of climate change on forest fires and pan-European strategies for preventing and managing these fires amidst a changing climate.

In the last decade, the European Commission has taken steps to address forest fires by implementing measures such as adopting the EU Forest Strategy and establishing the RescEU program. These initiatives are meant to prevent and manage forest fires and improve the EU's capacity to deal with large-scale fires. Considering the vast and intricate nature of the wildfire issues linked to climate change, additional efforts and coordinated endeavours from the European Commission may be necessary to combat the effects of climate change on forest strength at a European level. This will involve promoting sustainable forest management as the appropriate framework for a comprehensive approach to wildfire management.

There exist a multitude of pressing concerns that demand the attention of both European and national policymakers in their pursuit of refined policies that serve to safeguard and reinforce forests and natural landscapes within the EU. These concerns may encompass the following:

- Standardized prevention measures. Developing and implementing standardized prevention measures across the EU, such as supporting regular fuel reduction, firebreak construction, and Pan-European community outreach and engagement programs.
- Early warning systems. Implementing early warning systems has proven to be a viable strategy in mitigating the impact of wildfires. These systems typically involve satellite monitoring, remote sensing technologies, and citizen reporting programs to enable timely detection and response to wildfire incidents.
- Standardized suppression procedures. Focus should be on developing standardized protocols for managing forest fires. Standardized suppression procedures and systems must include interoperable firefighting equipment, techniques, and incident command systems.
- Cross-border cooperation. Facilitating cross-border collaboration and coordination between European Union member states is a viable approach to enhance the effectiveness of wildfire prevention, detection, and suppression initiatives.
- Rehabilitation and restoration measures. Developing standardized measures for rehabilitating and restoring forests following wildfires, including reforestation, erosion control, and restoring damaged habitats.
- Research and innovation. Promoting policy harmonization between countries that share similar fire regimes and wildfire management requirements is important. Additionally, end users should be trained to utilize research and innovation-driven improvements to enhance their operations.

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