Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

LANDSCAPE FIRE MANAGEMENT
IN THE WESTERN BALKANS
www.lfmwb.net



YOUTH AND COMMUNITY FIRE PREVENTION GUIDE FOR THE OHRID UNESCO REGION

A Training Manual for Youth Ambassadors, Farmers, and Community Leaders

ABOUT THIS MANUAL

This manual was developed to support youth, farmers, landowners, and community leaders in the Ohrid region to prevent landscape fires, respond safely, and contribute to the recovery of damaged ecosystems and cultural heritage.It integrates scientific best practices, traditional ecological knowledge, and community engagement strategies, providing a step-by-step approach to fire risk reduction, leadership development, and sustainable land management.The guide aligns with global frameworks including the UNESCO World Heritage Risk Management Guidelines, the FAO Fire Management Voluntary Guidelines, and the Sendai Framework for Disaster Risk Reduction.Through prevention, preparedness, leadership, and teamwork, this manual seeks to inspire action and strengthen resilience—helping to protect the region's biodiversity, cultural treasures, and local livelihoods from the growing threat of landscape fires.

Prepared by: Association for Ecology EKOMENLOG

Supported by: Landscape Fire Management Western Balkans (LFMWB) Programme/SDC/Farmahem

Table of Contents

Table of Contents i
List of Figures ii
List of Tables iii
Preface and Executive Summary 1
About This Manual 1
Key Objectives of the Manual 1
Why This Manual Is Needed 1
1.1 Context and Rationale 2
1.2 The Role of Community-Centered Prevention 2
1.3 Purpose of This Manual 2
1.4 Scope and Structure 3
1.5 Alignment with Global Frameworks 3
2.1 What Are Landscape Fires? 3
2.2 Types of Landscape Fires 3
2.3 What Causes Landscape Fires? 4
2.4 Why Are Fires Dangerous? (The Risks of Landscape Fires) 5
2.5 Climate Change and Fire Risk: A Growing Threat 6
2.6 The Importance of Prevention and Awareness 7
3.1 When Fire Becomes Destructive 7
3.2 Biodiversity at Risk 7
3.3 Damage to Cultural Heritage 8
3.4 Community Safety and Livelihood Impacts 8
3.5 The Domino Effect: How Fires Weaken Entire Systems 9
4.1 Stopping Fires Before They Start: Why Prevention Matters 9
5.1 Why Response Matters 13
Step 1: Recognize the Signs Early 14
Step 2: Report Immediately — Don't Assume Others Have Called 14

Step 3: Evacuate Early If Required 15
Step 4: Do NOT Try to Be a Hero — Know Your Limits 15
6.1 Why Firebreaks Matter for Agriculture, Biodiversity, and Safety 17
Step 1: Planning and Site Selection 17
Step 2: Design Specifications for Different Firebreak Types 17
Step 4: Recommended Native Species for Firebreak Planting 18
7.1 Why Recovery Matters 21
8.1 Why Traditional Knowledge Matters 24
9.1 Why Leadership and Communication Are Essential 26
9.2 Who Can Be a Fire Prevention Leader? 26
10.1 Why Use Checklists and Templates? 29
11.1 Fire Prevention Is Everyone's Responsibility 33
11.2 Youth as Leaders of Change 33
11.3 From Prevention to Resilience 33
11.4 Final Takeaway Messages 34
11.5 Together for a Fire-Free Ohrid 34
Annex 1. Fire Prevention Action Checklist (Printable Version) 36
Annex 2. Evacuation Planning and Preparation Checklist 36
Annex 3. Fire Reporting Template 36
Annex 4. Youth Awareness Activity Plan Template 37
Annex 5. Seasonal Calendar for Fire Prevention and Maintenance 37
Annex 6. Emergency Contacts List (Printable Template) 37
Annex 7. Optional Monitoring and Learning Record Sheet 38

List of Figures

Figure 1: Causes of Landscape Fires 4
Figure 2: Why Fires Are Dangerous 5
Figure 3: Fire Behavior Triangle 6
Figure 4: Buffer Zone Design for Fire Prevention 9

Figure 5: Waste Management Practices for Fire Prevention 10
Figure 6: Fire Response Flowchart: Stay Calm, Act Fast, Stay Safe 13
Figure 7: Fire-Resistant vs. Highly Flammable Plant Species 18
Figure 8: Seasonal Calendar for Fire Prevention and Maintenance 19
Figure 9: Participatory Monitoring and Recovery Cycle 23
Figure 10: Youth Leadership Roles in Fire Prevention 27

List of Tables

Table 1: Structure of the Training Mannuel & Trainings 3
Table 2: Landscape Fires Classification 3
Table 3: Impacts of Landscape Fires 5
Table 4: Landscape Fires Impact on Biodiversity 7
Table 5: Landscape Fires Impact on Cultural Heritage 8
Table 6: Landscape Fires Impact on Community Safety and Livelihood Impacts 8
Table 7: Creating Buffer Zones – Natures Protective Shield 10
Table 8: Manage Waste Safely – Don't Feed the Flames 11
Table 9: Raise Awareness – Spread Knowledge, Not Fire 11
Table 10: Maintain Green Infrastructure Wisely 12
Table 11: Equip Yourself and Your Community 12
Table 12: Recognize the Signs Early 14
Table 13: Evacuate Early If Required 15
Table 14: Do NOT Try to Be a Hero — Know Your Limits 15
Table 15: Youth Roles in Safe Response 15
Table 16: Basic Fire Safety Equipment 16
Table 17: After the Fire 16
Table 18: Design Specifications for Different Firebreak Types 17
Table 19: Vegetation Management Within Firebreak Zones 17
Table 20: Recommended Native Species for Firebreak Planting 18
Table 21: Cleaning and Maintaining Buffer Zones Safely 19
Table 22: Seasonal Calendar for Firebreak Maintenance 19
Table 23: Preventing Soil Erosion and Supporting Regrowth 20
Table 24: Assess the Damage 21
Table 25: Protect the Soil – The First Priority 21
Table 26: Replant Wisely (If Needed) 22
Table 27: Support Wildlife Recovery 22
Table 28: Monitoring Guide 22
Table 29: Integrating Traditional Practices with Modern Fire Management 25

Table 30: Skills of Effective Fire Prevention Leaders 26
Table 31: Tools for Effective Communication 27
Table 32: Youth Leadership in Action: Roles and Activities 28
Table 33: The Importance of Teamwork 28
Table 34: Fire Prevention Checklist for Communities and Farmers 30
Table 35: Evacuation Preparation Checklist 30
Table 36: Fire Response Information Template 30
Table 37: Youth-Led Awareness Activity Plan Template 31
Table 38: Post-Fire Recovery Monitoring Sheet 31
Table 39: Emergency Contacts Table 31

Preface and Executive Summary

The Ohrid region of North Macedonia, globally recognized as a UNESCO World Heritage site, represents a unique convergence of natural biodiversity and cultural heritage. This landscape of global importance is home to endemic species, ancient churches, and archaeological sites, forming a living mosaic of ecological and cultural values that has persisted for millennia (UNESCO, 2023; Albrecht & Wilke, 2008). However, these treasured ecosystems and heritage sites face increasing threats from landscape fires—an issue that is exacerbated by climate change, unsustainable land management practices, and human negligence (San-Miguel-Ayanz et al., 2022; Turco et al., 2018).

Fires in the Ohrid region are not simply environmental events; they are complex socio-ecological disturbances that affect biodiversity, cultural assets, local economies, and the health and well-being of communities. Frequent or intense fires can lead to habitat loss, degradation of soil and water resources, destruction of cultural monuments, and significant economic damage, particularly in tourism and agriculture (Bowman et al., 2009; Johnston et al., 2012).

While emergency response remains critical in minimizing immediate impacts, evidence from good global practices suggests that the most effective way to reduce fire risks lies in initiative-taking **prevention**, community awareness, and landscape-level planning (FAO, 2019). In particular, the empowerment of youth as active agents of change has emerged as a key strategy for building long-term resilience. Young people, through their creativity, leadership, and community engagement, can play a pivotal role in promoting fire prevention, supporting recovery efforts, and safeguarding both natural and cultural heritage (UNDRR, 2019).

About This Manual

This manual, titled **Youth and Community Fire Prevention Guide for the Ohrid UNESCO Region**, has been developed as a practical, action-oriented toolkit for young people (aged 15–25), farmers, landowners, and community leaders. It aims to provide participants with knowledge, skills, and leadership capacity to engage effectively in fire prevention, preparedness, safe response, and post-fire landscape recovery.

The content of this manual is grounded in:

- **Scientific best practices in fire ecology and prevention** (Keeley et al., 2011; Pausas & Keeley, 2019).
- **Traditional fire-related knowledge from the Ohrid region**, integrating local ecological wisdom with modern approaches (EKOMENLOG, 2025).
- **International guidelines and frameworks**, including those from the Food and Agriculture Organization (FAO, 2019), the European Commission Joint Research Centre (San-Miguel-Ayanz et al., 2022), and the United Nations Office for Disaster Risk Reduction (UNDRR, 2019).

The manual is structured to guide readers through understanding the causes and impacts of landscape fires, learning effective prevention strategies, practicing safe response, and contributing to ecosystem recovery after fire events. It also emphasizes leadership development, teamwork, and communication as essential components of successful fire prevention and management.

Key Objectives of the Manual

- Build awareness of the risks and dynamics of landscape fires in the Ohrid UNESCO region.
- Promote evidence-based and culturally respectful fire prevention practices.
- Enhance the leadership role of youth, farmers, and community members in local fire management efforts.
- Facilitate the integration of traditional fire-related knowledge with modern science.
- Support safe and sustainable recovery and restoration of affected landscapes.

Why This Manual Is Needed

- **Up to 90% of wildfires in the Mediterranean region are caused by human activities** such as careless burning, unsafe waste disposal, and negligence (San-Miguel-Ayanz et al., 2022).
- **Climate change is increasing the length and intensity of the fire season**, making fire events more frequent and unpredictable (Turco et al., 2018).

- The Ohrid region's biodiversity and cultural sites are particularly vulnerable to fire-related damage due to their ecological uniqueness and historical value (UNESCO, 2023).
- **Youth participation in disaster risk reduction** has been shown to improve community resilience and foster long-term stewardship of natural and cultural heritage (Calkin et al., 2011; UNDRR, 2019).

By equipping local communities and the next generation of leaders with the necessary tools, knowledge, and strategies, this manual contributes to building a safer, greener, and more resilient Ohrid region — where prevention is recognized as the first and most powerful line of defense.

"The best firefighting strategy is to prevent the fire from starting."
(FAO, 2019)

---

1. Introduction: Why This Guide Matters

1.1 Context and Rationale

The Ohrid UNESCO region stands as a beacon of both cultural heritage and ecological uniqueness, hosting some of Europe's oldest lakes, endemic biodiversity, and centuries-old monuments (UNESCO, 2023; Albrecht & Wilke, 2008). Yet, this exceptional landscape is increasingly at risk from **landscape fires**—uncontrolled or poorly managed fires that threaten ecosystems, cultural sites, local economies, and the health and safety of communities.

Most of these fires in Mediterranean and Balkan regions, including North Macedonia, are **human-induced**, caused by activities such as careless agricultural burning, poor waste management, and negligence in fire-prone landscapes (San-Miguel-Ayanz et al., 2022; FAO, 2019). Meanwhile, the ongoing impacts of **climate change**, including rising temperatures, longer drought periods, and extreme weather events—are compounding these risks by creating more favorable conditions for fires to ignite and spread (Turco et al., 2018).

In such a high-stakes environment, **reactive firefighting alone is not enough**. There is an urgent need to shift focus from response to **initiative-taking prevention, preparedness, and community-led action**.

1.2 The Role of Community-Centered Prevention

Landscape fire management is most effective when it is rooted in **local knowledge, participation, and shared responsibility**. According to the Food and Agriculture Organization of the United Nations, successful fire prevention strategies must engage local communities not only as beneficiaries but as active partners and leaders (FAO, 2019). This is especially relevant in areas like Ohrid where the cultural and ecological landscape is shaped by generations of human-nature interaction.

Youth engagement has been recognized by global frameworks on disaster risk reduction as a critical component of building long-term resilience. Young people bring fresh perspectives, energy, creativity, and strong social networks—qualities that can significantly amplify fire prevention efforts (UNDRR, 2019).

1.3 Purpose of This Manual

This manual has been designed as a **practical training tool** for:

- **Youth Ambassadors** (aged 15–25), including students, youth groups, and volunteers.
- **Farmers and Landowners** are responsible for agricultural lands and forest edges.
- **Community Leaders and Local Stakeholders** involved in landscape and cultural heritage management.

The manual's purpose is to:

✅ Build understanding of fire dynamics, risks, and ecological impacts.
✅ Promote safe, effective, and culturally sensitive fire prevention actions.
✅ Empower youth and communities with leadership, communication, and teamwork skills for fire risk reduction.

✅ Facilitate post-fire recovery planning and restoration efforts.
✅ Integrate **traditional ecological knowledge** with **scientific best practices** for sustainable fire management.

1.4 Scope and Structure

The manual offers a **step-by-step approach**, structured into the following core modules:
Table 1: Structure of the Training Mannuel & Trainings

Module	Focus Area
Understanding Landscape Fires	Causes, types, and impacts on biodiversity, culture, and society.
Fire Prevention Strategies	Buffer zones, waste management, fire-resistant species, community awareness.
Safe Response and Youth Roles	What to do in case of fire, including early detection, evacuation, and youth-safe actions.
Post-Fire Recovery	Soil protection, replanting, wildlife support, and monitoring.
Traditional Practices Integration	How local fire-related knowledge complements modern science.
Leadership and Communication	Mobilizing teams, spread awareness, and fostering local action.
Practical Checklists and Templates	Risk assessment, action planning, emergency contacts, monitoring tools.

1.5 Alignment with Global Frameworks

This manual aligns with key global initiatives, including:

- The **FAO Voluntary Guidelines on Fire Management** (FAO, 2019).
- The **UNDRR Sendai Framework for Disaster Risk Reduction 2015–2030** (UNDRR, 2019).
- The **European Forest Fire Information System (EFFIS)** recommendations (San-Miguel-Ayanz et al., 2022).
- The **UNESCO guidelines for safeguarding natural and cultural World Heritage sites** (UNESCO, 2023).

"Disaster risk reduction is not a choice—it's an investment in sustainable development."
(UNDRR, 2019)

🟢 2. Understanding Landscape Fires

2.1 What Are Landscape Fires?

Landscape fires refer to fires that occur in natural, semi-natural, or agricultural environments, including forests, grasslands, shrublands, wetlands, and farmland. These fires can be either **uncontrolled wildfires** or **intentionally set prescribed burns** used as part of land management practices (Pausas & Keeley, 2019).
Fire is not inherently negative. In many ecosystems, particularly Mediterranean and sub-Mediterranean environments like the Ohrid region, fire plays an important ecological role by supporting seed germination, maintaining biodiversity, and recycling nutrients (Keeley et al., 2011). However, when fire occurs **too frequently**, **too intensely**, or **at the wrong time and place**, it can cause severe ecological degradation, threaten human lives, and damage cultural heritage.
The challenge lies in **distinguishing beneficial fire use from harmful fire events**—and in ensuring that human actions do not turn fire from a natural process into a disaster.

2.2 Types of Landscape Fires

Landscape fires can be classified based on their origin, purpose, and level of control:
Table 2: Landscape Fires Classification

Type of Fire	Description	Example in the Region

Wildfires	Unplanned, uncontrolled fires that spread rapidly across vegetation and landscapes.	Wildfires in Galicica National Park (2007, 2021) damaging pine forests and grasslands (EEA, 2018).
Prescribed Fires	Planned and controlled burns used intentionally to reduce fuel loads, maintain healthy ecosystems, or promote grazing.	Applied in pastureland management or fuel reduction under expert supervision.
Agricultural Fires	Fires were used to clear fields of stubble, branches, or other residues. Risky if not effectively managed or regulated.	Burning of orchard residues or clearing of agricultural lands near forests.

(Sources: FAO, 2019; Keeley et al., 2011; Pausas & Keeley, 2019)

2.3 What Causes Landscape Fires?

Fires may be triggered by either **natural factors** or **human activities**. However, in the Mediterranean and Western Balkan regions, including North Macedonia, studies show that **over 90% of wildfires are caused by human actions** (San-Miguel-Ayanz et al., 2022).

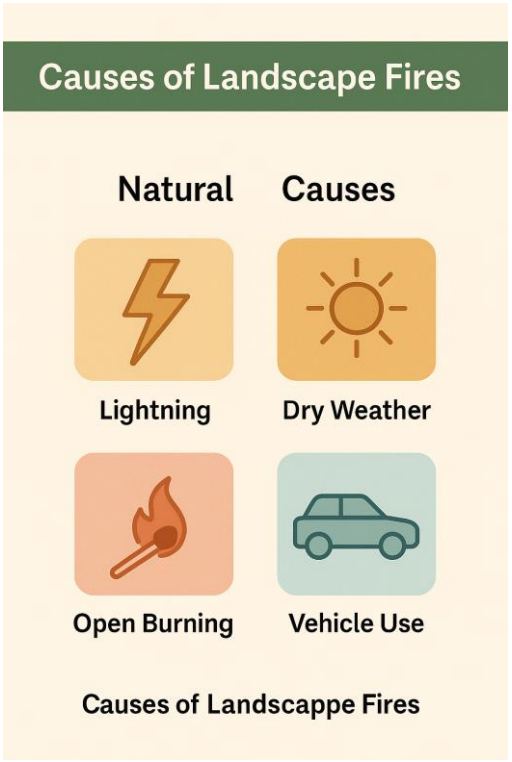
✅ **Natural Causes:**

- **Lightning strikes** during dry storms.
- Rarely, **volcanic activity** (not present in the Ohrid region).

❌ **Human Causes:**

- Careless agricultural burning and stubble clearing.
- Discarded cigarette butts and matches.
- Unattended campfires, barbecue pits, or bonfires.
- Arson (deliberate fire setting).
- Sparks from vehicles, chainsaws, or other machinery.
- Poor waste management (e.g., combustible waste near vegetation).
- Neglect of safe buffer zones between human activities and fire-prone areas.

Figure 1: Causes of Landscape Fires



Most landscape fires are caused by human activities such as agricultural burning, waste mismanagement, and negligence with fire sources like cigarettes or campfires. Natural causes, including lightning strikes, account for a much smaller proportion. Preventing human-caused fires is the most effective strategy for risk reduction.

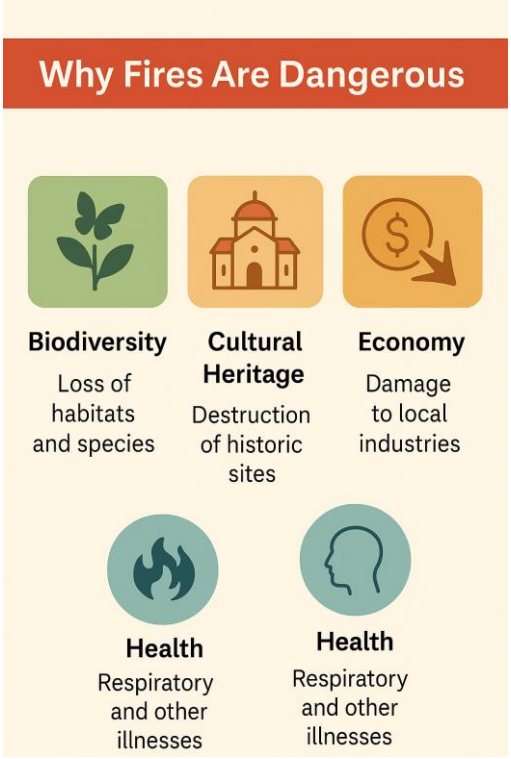
> *"Human negligence remains the dominant cause of wildfires across the Mediterranean basin" (FAO, 2019, p. 14).*

2.4 Why Are Fires Dangerous? (The Risks of Landscape Fires)

Although fire has natural functions in some ecosystems, **uncontrolled fires** bring significant risks, particularly when occurring:

- After long dry periods (drought conditions).
- In areas with high fuel loads (dry grass, shrubs, pine needles).
- Close to **homes**, **villages**, and **cultural monuments**.

Figure 2: Why Fires Are Dangerous



Landscape fires in the Ohrid region pose significant risks to four key areas: biodiversity (loss of habitats and endemic species), cultural heritage (damage to monuments and historical sites), economy (reduction of tourism and agricultural productivity), and health (air pollution and respiratory problems). Understanding these impacts is essential for effective fire prevention.

The main risks are summarized below:

Table 3: Impacts of Landscape Fires

Impact Area	Example of Risk

Biodiversity Loss	Destruction of endemic species' habitats, such as the Macedonian pine (*Pinus peuce*) and sensitive orchid species (Keeley et al., 2011; EEA, 2018).
Cultural Heritage Damage	Heat and smoke harming ancient churches, frescoes, and archaeological remains around Lake Ohrid (UNESCO, 2023).
Economic Damage	Loss of tourism revenue, damaged agriculture, and reduced forestry productivity (Bowman et al., 2009).
Community Safety	Health risks from smoke inhalation, forced evacuations, and property loss (Johnston et al., 2012).

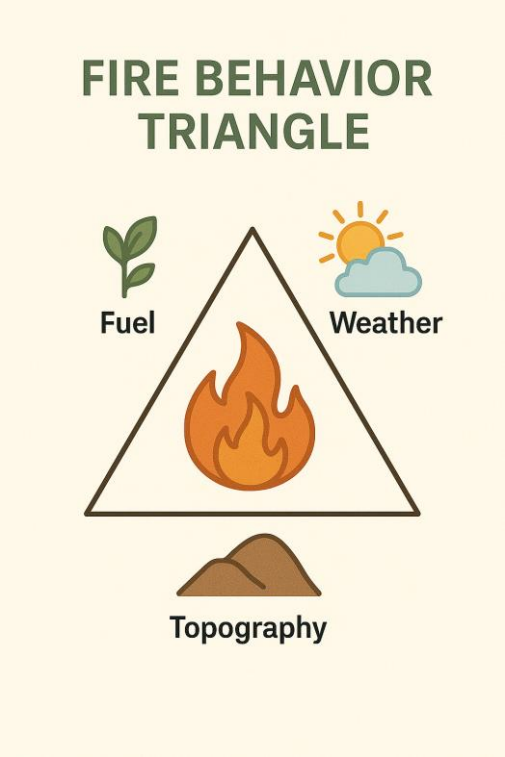
2.5 Climate Change and Fire Risk: A Growing Threat

Research shows that **climate change is significantly worsening fire conditions**, especially in Mediterranean regions. Key climate-driven factors include:

- Rising average air temperatures.
- Prolonged drought periods.
- Increased frequency of **heatwaves**.
- More erratic weather patterns, including fierce winds (Turco et al., 2018).

These changes create a **longer and more intense fire season**, where even a small spark can ignite a major blaze.

Figure 3: Fire Behavior Triangle



The behavior of landscape fires is influenced by three interacting factors: fuel (type, amount, and arrangement of vegetation), weather (wind, temperature, humidity), and topography (slope, aspect, terrain). Understanding how these elements combine helps predict fire intensity and spread.

"Climate-induced fire risk is now a permanent feature of Mediterranean environments" (Turco et al., 2018, p. 2977).

2.6 The Importance of Prevention and Awareness

Prevention remains the most effective defense against landscape fires. Understanding the causes and impacts of fires enables individuals and communities to:

- **Recognize risky behaviors** (e.g., unsafe burning, waste mismanagement).
- **Act responsibly** to reduce ignition risks.
- **Participate actively** in fire prevention, response readiness, and recovery planning.

Successful fire prevention requires **shared responsibility** between residents, farmers, youth groups, and decision-makers.

"Preventing landscape fires is not only an environmental necessity; it is a social and cultural responsibility" (FAO, 2019, p. 22).

---

3. How Fires Affect Our Nature, Culture, and Community

3.1 When Fire Becomes Destructive

Although fire plays an ecological role in certain environments, **uncontrolled, frequent, or intense landscape fires** bring severe and often irreversible damage, particularly in sensitive regions such as the Ohrid UNESCO area. In this region, **biodiversity, cultural heritage, and local livelihoods are deeply interconnected**, making the impacts of fire not only environmental but also social, economic, and cultural.

Frequent fires can destabilize ecosystems, **accelerate biodiversity loss**, damage irreplaceable cultural monuments, and jeopardize the safety and livelihoods of communities who depend on the land for farming, grazing, forestry, or tourism (UNESCO, 2023; Bowman et al., 2009).

"The consequences of landscape fires extend far beyond the immediate burning—they disrupt the very systems that support life, culture, and economic stability" (FAO, 2019, p. 25).

Understanding these risks is the first step toward **effective prevention, preparedness, and recovery planning**.

3.2 Biodiversity at Risk

The Ohrid region is internationally recognized as a **biodiversity hotspot**, home to many endemic species—plants, animals, and microorganisms found nowhere else on Earth (Albrecht & Wilke, 2008). Lake Ohrid, one of the oldest lakes in the world, and Galicica National Park, with its unique alpine and sub-alpine habitats, are especially vulnerable to fire-related disturbances.

Uncontrolled fires can lead to:

Table 4: Landscape Fires Impact on Biodiversity

Impact on Biodiversity	Explanation
Habitat loss and fragmentation	Fires clear large areas of vegetation, making it difficult for wildlife to find food, shelter, or migration corridors (Pausas & Keeley, 2019).
Species extinction risks	Fire-sensitive species such as certain orchids, amphibians, and invertebrates may not survive repeated burning events (Keeley et al., 2011).

Invasive species spread	Burned landscapes are vulnerable to fast-growing invasive plants that outcompete native species, blocking natural recovery processes (Certini, 2005).

Case Example: *In Galicica National Park, wildfires have damaged key areas for* ***Macedonian pine (Pinus peuce)*** and high mountain grasslands, disrupting these delicate ecosystems (EEA, 2018).

3.3 Damage to Cultural Heritage

The Ohrid UNESCO region is not only an ecological treasure but also a **cultural World Heritage site**, featuring ancient churches, monasteries, and archaeological remains that reflect more than two millennia of human civilization (UNESCO, 2023). Fires pose direct and indirect threats to these irreplaceable cultural assets.

Table 5: Landscape Fires Impact on Cultural Heritage

Impact on Cultural Heritage	Explanation
Direct heat and flame damage	Intense heat can crack stone walls, damage roof structures, and destroy frescoes and mosaics.
Smoke and soot exposure	Chemical deposits from smoke can stain and deteriorate historical materials over time.
Firefighting side effects	Use of water, chemicals, or physical disturbance during firefighting can inadvertently damage fragile heritage sites (UNESCO, 2023).

Important Note: Cultural monuments, once damaged by fire, are often **impossible to fully restore**. Prevention and prompt action remain the best strategy.

3.4 Community Safety and Livelihood Impacts

Landscape fires directly affect local people—not just through immediate threats to safety, but also through **long-term economic disruption and health risks**. The rural communities around Lake Ohrid rely heavily on **agriculture, forestry, grazing, and tourism**—sectors that are highly vulnerable to fire impacts (Bowman et al., 2009).

Table 6: Landscape Fires Impact on Community Safety and Livelihood Impacts

Impact Area	Risk Description
Loss of agricultural production	Fires can destroy orchards, vineyards, pastures, and store crops, leading to economic hardship for farming families.
Tourism decline	Burned landscapes, trail closures, and damaged cultural sites reduce tourist visits and income (UNESCO, 2023).
Health hazards	Smoke inhalation can cause respiratory problems, particularly among vulnerable groups such as children, the elderly, and people with asthma (Johnston et al., 2012).
Forced evacuations and displacement	In severe cases, fires may force residents to evacuate or abandon homes, disrupting social cohesion and community life.

Real Example: *During the 2021 wildfire season in Galicica,* ***early evacuations prevented serious human injuries*** *but highlighted the vulnerability of nearby villages to fire threats (EEA, 2018).*

3.5 The Domino Effect: How Fires Weaken Entire Systems

The effects of fire are rarely isolated. Uncontrolled fires initiate a **cascade of negative consequences** across environmental, economic, cultural, and social systems:

1. **Loss of vegetation cover →**
2. **Soil erosion and landslides →**
3. **Degraded water quality and sedimentation in lakes →**
4. **Biodiversity loss and habitat disruption →**
5. **Decline in tourism and agriculture →**
6. **Damage to cultural heritage →**
7. **Community displacement and health impacts.**

This **"Domino Effect"** underlines why fire management should not be treated as a firefighting issue alone but as a critical component of **landscape stewardship and disaster risk reduction** (FAO, 2019).

"Preventing fire means protecting biodiversity, cultural identity, and livelihoods — safeguarding the future of the Ohrid community" (UNESCO, 2023).

🟢 4. What We Can Do – Fire Prevention

4.1 Stopping Fires Before They Start: Why Prevention Matters

Landscape fires may often appear as unavoidable natural disasters, but research shows that **most fires in Mediterranean and Balkan regions are preventable**. In fact, up to **90% of wildfires** are caused by human actions such as unsafe burning of agricultural residues, careless waste disposal, and negligence (San-Miguel-Ayanz et al., 2022; FAO, 2019).
This is both sad news and good news:

❌ Bad news — most fires are human-caused.

✅ Good news — this means we have the power to stop them.

Fire prevention is not about waiting for emergencies. It is about **creating safer, well-managed landscapes and informed communities** that work together to reduce risks every day.
Whether you are a farmer, a student, a hiker, or a community leader, **you have a role to play**. Prevention is everyone's responsibility.

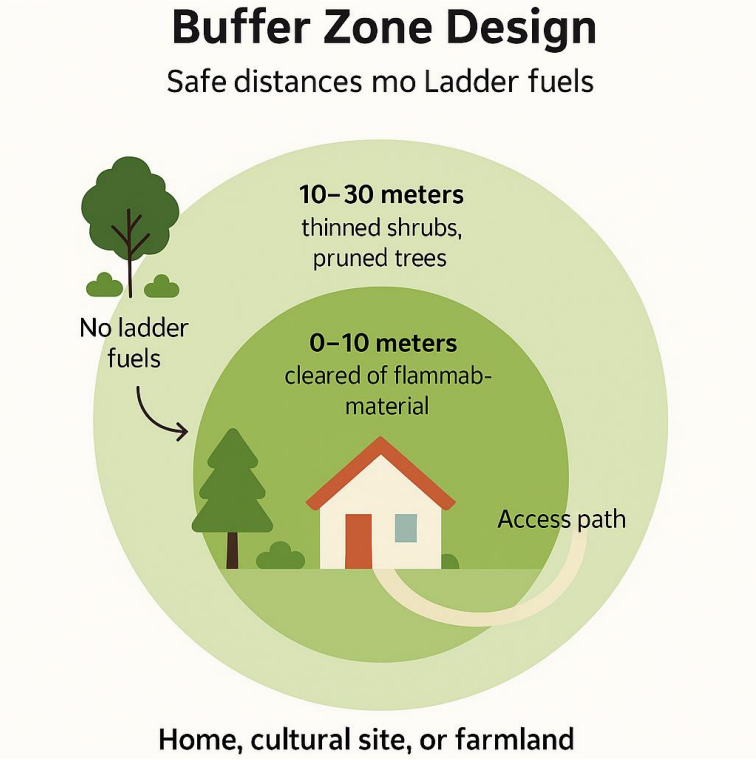
🟠 4.2 Fire Prevention Strategies

This section introduces **five key strategies** for preventing landscape fires. These are designed to be practical, culturally respectful, and based on both **the best scientific practices** and **traditional ecological knowledge**.

✅ Strategy 1: Create Buffer Zones – Nature's Protective Shield

Buffer zones are areas where vegetation is reduced, cleared, or managed to slow or stop the spread of fires into homes, cultural sites, agricultural lands, or settlements. These zones work like a security system in computer systems—**blocking the fire from reaching critical assets**.

Figure 4: Buffer Zone Design for Fire Prevention



Meticulously designed buffer zones reduce fire risk by maintaining cleared areas around homes, farmland, and cultural sites. The inner zone (0–10 meters) should be fully cleared of flammable material, while the outer zone (10–30 meters) should feature thinned shrubs, pruned trees, and no ladder fuels. Safe access paths should be kept open for firefighting and evacuation.

Table 7: Creating Buffer Zones – Natures Protective Shield

Good Buffer Zone Practices	Explanation
Maintain at least 10–50 meters of cleared space around homes, roads, or heritage sites.	Reduces direct contact between fire and structures (FAO, 2019).
Use fire-resistant species with high moisture content and low flammability (e.g., chestnut, ash, maple).	Avoids fast-spreading flames from resinous plants like pine or juniper (Agee & Skinner, 2005).
Remove ladder fuels (dry grass and shrubs beneath trees).	Prevents fire from climbing into the tree canopy.
Keep access paths clear for firefighting vehicles and teams.	Ensures safe and quick response if needed.

Regional Example: *Following the 2007 Galicica wildfire, experts recommended buffer zones between forested slopes and local roads as one of the key preventive measures (EEA, 2018).*

✅ Strategy 2: Manage Waste Safely – Do not Feed the Flames

Burning trash or leaving combustible waste near vegetation is a leading cause of preventable fires. Proper **waste management** helps break the chain of ignition.

Figure 5: Waste Management Practices for Fire Prevention



Poor waste management, such as dumping plastics, glass, or organic debris near vegetation, increases fire risks. Good practices include composting organic waste, recycling non-combustible materials, and keeping surroundings clean and clear of flammable trash. Preventing ignition sources starts with responsible waste disposal.

Table 8: Manage Waste Safely – Do not Feed the Flames

Safe Waste Management Tips	Why It Matters
Never burn trash outdoors, especially during dry, windy days.	Open waste burning is a major source of accidental fire ignition (FAO, 2019).
Compost organic materials like branches, leaves, and grass clippings.	Safer and environmentally friendly alternative to burning.
Recycle or safely dispose of plastics, glass, and metal.	Reduces combustible materials and prevents glass from acting as a magnifying lens.
Regularly clear dry materials from yards, gardens, and building perimeters.	Keeps potential fuels away from ignition sources.

*Did you know? A **broken glass bottle in the sun** can ignite dry grass by concentrating sunlight like a magnifying glass.*

✅ Strategy 3: Raise Awareness – Spread Knowledge, Not Fire

Preventing fires is a **shared community responsibility**. Awareness-raising activities ensure that everyone knows **what causes fires, how to avoid risky behavior, and what to do in case of danger**.

Table 9: Raise Awareness – Spread Knowledge, Not Fire

Awareness-Raising Activities	Impact
Community notice boards, posters, and flyers.	Reach local audiences directly with key messages.
Youth-led social media campaigns (short videos, Instagram posts).	Amplify messages using creative digital tools.

School-based workshops, drawing competitions, and clean-up events.	Engage the next generation early in prevention efforts.
Fire safety information at festivals, fairs, or markets.	Informs people where they gather socially.

Global Example: *Community-based fire prevention programs in Portugal and Spain significantly reduced fire incidents by empowering residents and farmers through clear awareness campaigns (FAO, 2019).*

✅ Strategy 4: Maintain Green Infrastructure Wisely

Not all plants burn the same way. Choosing the right species and landscape design helps to **reduce fire intensity** and slow its spread.

Table 10: Maintain Green Infrastructure Wisely

Green Solutions for Fire Safety	Explanation
Use fire-resistant plants such as chestnut (*Castanea sativa*), ash (*Fraxinus ornus*), olive trees (*Olea europaea*).	These species have higher moisture content and lower flammability (Agee & Skinner, 2005).
Avoid large clusters of resin-rich plants like pine (*Pinus spp.*), juniper (*Juniperus spp.*), and cypress (*Cupressus spp.*).	These species increase fire risk due to high oil content.
Maintain soil moisture through mulching and controlled irrigation.	Healthier vegetation burns less easily.
Break continuous fuel lines with well-spaced plants and open areas.	Reduces the speed at which fire can spread.

✅ Strategy 5: Equip Yourself and Your Community

Readiness is prevention.

Having the right equipment and clear action plans improves your community's capacity to act quickly and safely.

Table 11: Equip Yourself and Your Community

Basic Fire Prevention Tools	Purpose
Water tanks, hoses, or buckets	Enable rapid response to small fires.
Fire beaters, rakes, or shovels	Smother grass fires before they spread.
Personal protective equipment (PPE)	Helmets, gloves, boots, and masks for safe action.
Cleared access routes	Ensure fire trucks and teams can reach the site.

Personal Safety Reminder: *Always have an* ***emergency plan*** *and know the local fire emergency number (****193*** *in North Macedonia).*

4.3 Key Message: Prevention Is Power

Preventing landscape fires is **the most effective, affordable, and safest way** to protect people, nature, and heritage. Every tree saved, every risky behavior avoided, and every informed community member makes the difference between **safety and disaster**.

"The best firefighting strategy is to prevent the fire from starting."
(FAO, 2019, p. 14).

🟢 5. How to Respond – If Fire Happens

(Stay Calm. Act Fast. Safety First.)

5.1 Why Response Matters

Even with the best prevention strategies in place, fires may still occur due to natural causes (like lightning) or unforeseen accidents. When fire breaks out, the most important priority is **personal safety and rapid, organized action**.

"Preparedness and early response can significantly reduce the loss of life, property, and environmental damage" (FAO, 2019, p. 36).

This section provides **step-by-step guidelines** for safe and effective response, focusing on **what young people, farmers, and community members can do without putting themselves at risk**.

🟠 5.2 The Fire Response Principles

✅ **Do not panic — stay calm and think clearly.**
✅ **Do not take unnecessary risks — your life comes first.**
✅ **Alert the authorities immediately — never assume someone else has reported it.**
✅ **Help others evacuate safely if advised by authorities.**

"Your safety always comes first. Never fight a fire that is too big, too fast, or out of control" (NFPA, 2021).

🟠 5.3 Step-by-Step: What to Do If You See Fire

Figure 6: Fire Response Flowchart: Stay Calm, Act Fast, Stay Safe



In the event of a fire, immediate and organized action saves lives. The correct response sequence is recognizing the early signs of fire → report immediately to the authorities → evacuate safely if necessary → support others and follow instructions from trained teams. Personal safety is the priority—never attempt to fight large fires without training.

Step 1: Recognize the Signs Early

The sooner a fire is detected, the easier it is to stop.
Stay alert for:

Table 12: Recognize the Signs Early

Early Warning Sign	What It May Indicate
Columns of smoke, even far away.	Fire ignition point.
The unusual smell of burning vegetation.	Fire may be nearby, even if not visible yet.
Sudden changes in wind direction.	May carry embers and flames toward your area.
Unusual wildlife behavior or fleeing animals.	Fire disturbance in their habitat.

Check reliable fire danger forecasts regularly:

- **EFFIS daily fire risk maps** (https://effis.jrc.ec.europa.eu).
- Local government warnings and civil protection alerts.

Youth Role: Share early alerts through WhatsApp groups, Viber, Instagram Stories, or local notice boards to help spread the word quickly.

Step 2: Report Immediately — Do not Assume Others Have Called

If you see smoke or flames:

- **Call the Fire Service immediately**: **193 (North Macedonia fire emergency number).**

- Provide **clear and accurate information**:
  - Exact location (landmarks, road names, or GPS coordinates).
  - Approximate size of the fire (small, medium, large).
  - Type of vegetation burning (grass, shrubs, forest).
  - Direction the fire is moving (if visible).
  - Any people, homes, or cultural sites nearby.

✅ **DO NOT attempt to extinguish large fires yourself.**
Leave this to trained firefighting teams.

Step 3: Evacuate Early If Required

If authorities recommend evacuation—or if the fire is approaching your area—leave immediately. **Do not wait until it is too late.**

Table 13: Evacuate Early If Required

Evacuation Checklist	Why It is Important
Grab your emergency kit: ID, medicine, mobile phone, charger, water, flashlight, first aid.	Allow quick, safe exit without wasting time.
Wear protective clothing: long pants, long sleeves (cotton preferred), boots, hat, mask, or cloth for face protection.	Reduces the risk of burns and smoke inhalation.
Close all windows and doors before leaving.	Slows down fire entry into buildings.
Know multiple escape routes (not just one exit).	Avoids getting trapped if fire blocks one path.
Stay low to the ground in smoking conditions.	Smoke rises—lower air is clearer.
Always follow official instructions.	Keeps you aligned with coordinated evacuation plans.

***Real Example:** During the **2021 Galicica fire**, early evacuations of nearby villages helped prevent casualties, underscoring the importance of acting fast (EEA, 2018).*

Step 4: Do NOT Try to Be a Hero — Know Your Limits

⚠️ **Never attempt to fight fast-moving or large fires without proper training and equipment.**

Table 14: Do NOT Try to Be a Hero — Know Your Limits

Only attempt to extinguish a fire when:	If any of these apply, STOP, and evacuate:
The fire is small, low-intensity, and manageable (like a grass patch or small campfire).	The fire is spreading rapidly.
You have water, sand, or fire beaters ready.	Wind conditions are changing unpredictably.
You can act without risking yourself or others.	There is dense smoke or poor visibility.
You have clear escape routes.	You feel unsure or unsafe about the situation.

🟢 5.4 Youth Roles in Safe Response (Without Direct Firefighting)

Youth can play a powerful role in fire response—but safely, without putting themselves at unnecessary risk.

Table 15: Youth Roles in Safe Response

What Youth Can Do	Why This Helps

Help spread evacuation messages via social media and direct contact.	Speeds up warning to neighbors and vulnerable groups.
Assist elderly, disabled, or children in evacuating.	Supports community safety and reduces panic.
Provide emergency supplies support (water, medicine, tools).	Keeps resources flowing where needed.
Update and share contact lists and maps with responders.	Ensure accurate information during emergencies.
Participate in training, first-aid courses, and simulation exercises.	Builds preparedness skills for future incidents (NWCG, 2021).

⚠ **DO NOT attempt direct firefighting unless you are professionally trained and equipped.**

🟢 5.5 Know Your Tools: Basic Fire Safety Equipment

Table 16: Basic Fire Safety Equipment

Equipment	Purpose	When to Use
Fire beater or rake	To smother small ground fires.	Only for small, slow-moving fires.
Water hose, buckets, or tanks	To extinguish small flames, close to a water source.	Nearby and safe areas only.
Shovel or Pulaski tool	To clear vegetation or create fire lines.	In controlled situations, not in fast-spreading fires.
Personal protective gear (PPE)	Helmet, gloves, boots, face covering.	Always use when participating in any safe response activities.

Preparedness today prevents tragedies tomorrow" (FAO, 2019, p. 38).

🟠 5.6 After the Fire: Stay Alert, Stay Safe

Even when flames seem extinguished, dangers remain. Fires can restart from **hidden hotspots, roots, or embers**.

Table 17: After the Fire

Post-Fire Safety Tips	Why It Matters
Do not return to burned areas unless the authorities declare safe.	Smoldering embers may still ignite new flames.
Stay away from damaged structures, burned trees, and power lines.	Elevated risk of collapse, injury, or electrocution.
Monitor for soil erosion or landslides, especially on slopes.	Burned soil is unstable and prone to wash-off.
Report any new smoke or embers immediately.	Early detection helps prevent re-ignition.

🟢 Key Message: Respond Smart – Your Life Comes First

Responding to fire is **not about heroics**—it is about **making smart choices that protect your life, your family, your heritage, and your community**. The best outcomes happen when everyone knows their role, respects the guidance of trained professionals, and acts responsibly.

"Success in fire management is not only measured by how fast we respond but by how safely we do so" (NFPA, 2021).

🟢 6. Firebreak Creation and Maintenance for Farmers and Landowners

6.1 Why Firebreaks Matter for Agriculture, Biodiversity, and Safety

Firebreaks are strategically cleared or managed strips of land designed to slow down, stop, or redirect the spread of landscape fires. For farmers, landowners, and rural communities, firebreaks are a critical tool to protect:

- Agricultural fields, orchards, and pasturelands.
- Infrastructure, livestock, and stored harvests.
- Surrounding forests, biodiversity hotspots, and cultural heritage sites.

Carefully planned and maintained firebreaks also contribute to **landscape resilience**, supporting biodiversity by creating mosaics of vegetation, improving wildlife corridors, and integrating natural fire barriers into land use planning (Fernandes & Botelho, 2003; FAO, 2021).

"A well-designed firebreak is not just an empty strip of land—it is an active defense line against disaster" (FAO, 2019, p. 46).

6.2 Step-by-Step: How to Design, Establish, and Maintain Firebreaks

Step 1: Planning and Site Selection

The first step in effective firebreak creation is identifying **high-risk zones**:

✅ Areas where agricultural land meets forests or shrublands.
✅ Slopes or hilltops where fire could spread uphill quickly.
✅ Roads, pathways, or property boundaries.
✅ Zones near critical infrastructure (water tanks, storages, fences).
✅ Cultural heritage sites.

Use local knowledge, maps, or GIS tools to prioritize areas for intervention (Rodrigues et al., 2018).

***Best Practice:** Follow **contour lines** on slopes to prevent soil erosion during and after clearing.*

Step 2: Design Specifications for Different Firebreak Types

Table 18: Design Specifications for Different Firebreak Types

Type of Firebreak	Recommended Width	Purpose
Primary Firebreak (mechanical clearing)	10–20 meters wide	Stops high-intensity fire fronts; used at the edges of large fields or forests.
Secondary Firebreak (manual clearing)	3–10 meters wide	Slows down fire spread; protects smaller fields, houses, or infrastructure.
Access Roads Used as Firebreaks	Maintain **5–10 meters clear** on both sides of roads.	Provides dual function: vehicle access + fire spread prevention.

(Sources: FAO, 2019; EEA, 2018; USDA, 2014)

Step 3: Vegetation Management Within Firebreak Zones

Table 19: Vegetation Management Within Firebreak Zones

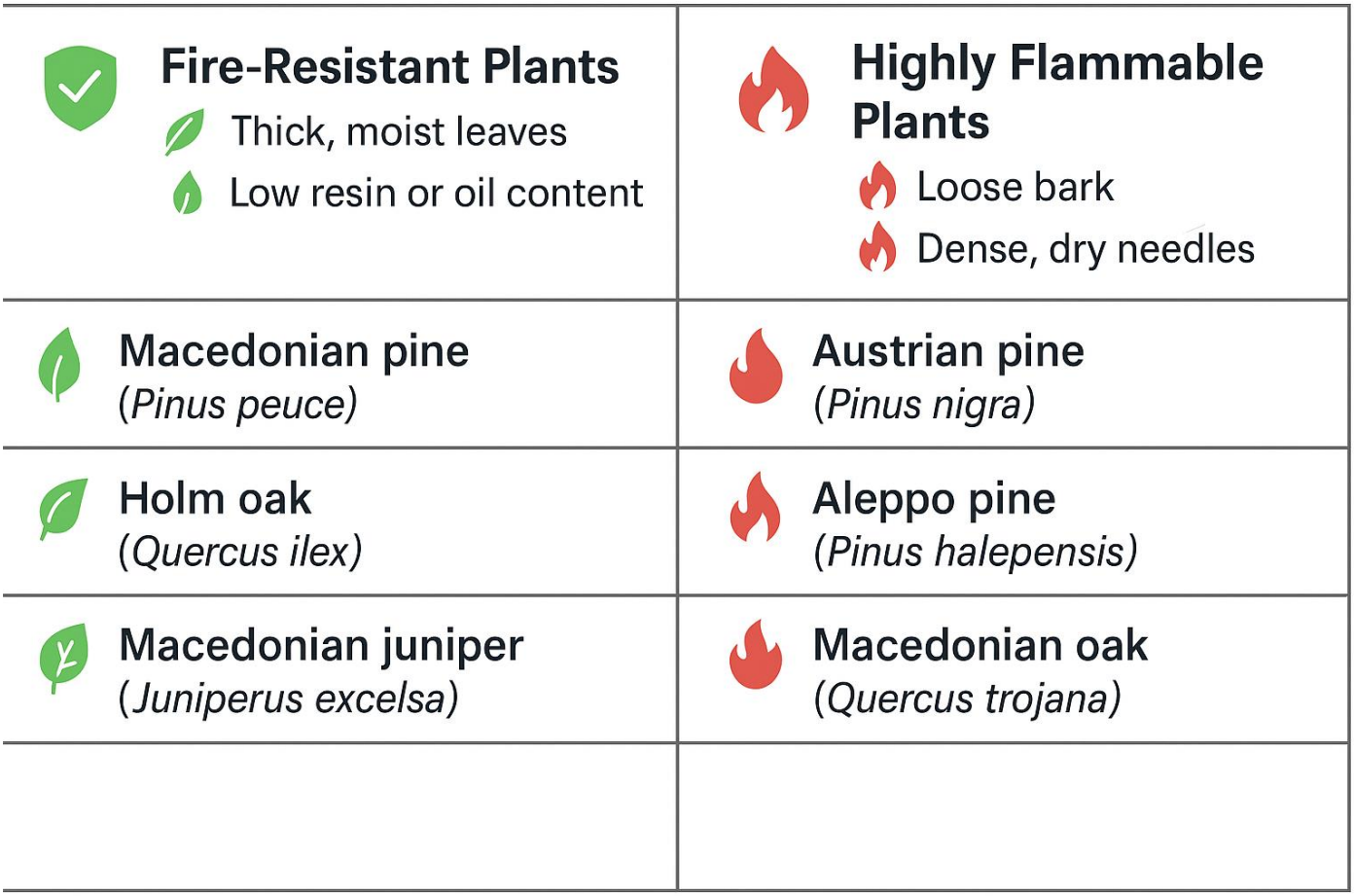
Vegetation Management Task	Action

Remove deadwood, dry grass, and shrubs.	Prevents buildup of flammable materials.
Eliminate ladder fuels (low branches, undergrowth).	Stops fire from climbing from the ground into tree canopies.
Trim low-hanging tree branches up to 2 meters from the ground.	Maintains a safe canopy height and separation.
Maintain grass height at max 10 cm.	Reduces fuel continuity.
Space trees and shrubs to avoid dense, continuous canopies.	Creates natural fuel breaks and safer fire zones.

Step 4: Recommended Native Species for Firebreak Planting

The choice of species within or near firebreaks is essential. Use **native, low-flammability species** that also contribute to erosion control and soil stabilization.

Figure 7: Fire-Resistant vs. Highly Flammable Plant Species



Selecting the right plant species near homes, firebreaks, and agricultural zones is a key prevention measure. Fire-resistant species like chestnut (Castanea sativa), ash (Fraxinus ornus), and dogwood (Cornus sanguinea) reduce fire spread, while flammable species such as pine (Pinus spp.), juniper (Juniperus spp.), and cypress (Cupressus spp.) increase risks. Proper plant choice supports both safety and ecological health.

Table 20: Recommended Native Species for Firebreak Planting

Plant Type	Scientific Name	Benefits
Trees	*Castanea sativa* (chestnut)	High moisture content, erosion control.
	Fraxinus ornus (manna ash)	Deciduous, slow to ignite.
	Acer campestre (field maple)	Low flammability foliage.
Shrubs	*Viburnum tinus*	Low resin, compact growth.

	Cornus sanguinea (dogwood)	Fire-resistant, soil stabilizer.
Ground Cover	*Trifolium repens* (white clover)	Maintains green cover, fixes nitrogen.

⚠ Important: Avoid planting highly flammable species such as pine (Pinus spp.), juniper (Juniperus spp.), and cypress (Cupressus spp.) within firebreak zones (Pausas & Keeley, 2019; FAO, 2021).

6.3 Cleaning and Maintaining Buffer Zones Safely

Maintenance of firebreaks is as important as their initial creation. Poorly maintained zones can quickly become overgrown and ineffective.

Table 21: Cleaning and Maintaining Buffer Zones Safely

Task	Method	Safety Considerations
Dry grass cutting	Manual tools, brush cutters, or grazing.	Avoid sparks during dry weather; work in early morning or late afternoon.
Shrub removal	Hand tools preferred over mechanical in dry periods.	Stack biomass safely away from fire-prone zones.
Branch trimming	Trim up to 2 meters from the ground.	Use personal protective equipment (PPE).
Waste disposal after clearing	Compost, chip for mulch, or burn only during legal periods under local regulations.	Never leave cut biomass piled near forests.

***Legal Compliance Reminder:** Follow North Macedonia's laws and local municipality guidelines on **burning waste or agricultural residues**.*

6.4 Seasonal Calendar for Firebreak Maintenance

Table 22: Seasonal Calendar for Firebreak Maintenance

Activity	Recommended Period	Notes
Cutting dry grass and shrubs	Late winter to early spring (February–April).	Prevents risk buildup before fire season.
Tree pruning and thinning	Late autumn to early spring (November–March).	Allows fuel reduction before summer heat.
Replanting / reseeding native species	Early spring (March–April) or autumn (September–October).	Ensure plant establishment before droughts.
Inspection and maintenance	Twice per year: spring and autumn.	Check after storms, winds, or previous fires.

(Sources: FAO, 2019; EEA, 2018; USDA Forest Service, 2014)

Figure 8: Seasonal Calendar for Fire Prevention and Maintenance



January – February	January – Februnry
	Firebreak inspection, early pruning, clearing dead branches
	Grass cutting, fuel load reduction, awareness campaigns
	Final firebreak checks before dry season; social media remimders
	No burning, high alert monitoring, community patrols, waste removal
	Post-season evaluation, recovery planting (if needed), invasive species monitoring
November–December	Planning for next year, community meetings tool maintenance

The seasonal calendar highlights the recommended timing for key fire prevention, maintenance, and recovery activities throughout the year. Actions such as grass cutting, firebreak maintenance, pruning, and awareness campaigns are best aligned with seasonal conditions to maximize safety and effectiveness.

6.5 Preventing Soil Erosion and Supporting Regrowth

Firebreaks, especially on slopes, can contribute to **soil erosion** if not designed carefully. Apply the following measures to avoid land degradation:

Table 23: Preventing Soil Erosion and Supporting Regrowth

Erosion Control Practice	Purpose
Clear along contour lines, not up and down slopes.	Reduces runoff speed and soil wash-off.
Apply mulch (wood chips, straw, biodegradable mats).	Protects bare soil, retain moisture, and prevent erosion.
Plant staggered rows of shrubs or ground cover.	Stabilizes soil and encourages biodiversity.
Monitor after heavy rains.	Detects early signs of erosion or slope failure.

Ecological Benefit: *Well-maintained firebreaks can serve as* ***wildlife corridors*** *and support pollinator species while reducing fire risk.*

6.6 Key Message: Firebreaks as a Prevention Backbone

A firebreak is **not just an empty strip of land**—it is a thoughtfully managed space that helps protect lives, livelihoods, ecosystems, and heritage. Combined with other prevention strategies like waste management, awareness campaigns, and community engagement, firebreaks form the **backbone of landscape fire risk reduction**.

"An effective firebreak is a first line of defense—not the last hope for survival" (FAO, 2019, p. 47).

7. After the Fire – How to Help the Land Recover

7.1 Why Recovery Matters

When the flames are gone, the damage may continue. Fires leave behind **weakened ecosystems, damaged soils, destroyed vegetation, and vulnerable wildlife**. Without proper post-fire recovery actions, these areas remain exposed to erosion, invasive species, water pollution, and further ecological degradation (Pausas & Keeley, 2019; Certini, 2005). **Post-fire recovery is not just about planting trees**, it is about restoring the health of the entire landscape and supporting the natural processes that help ecosystems heal.

"The recovery phase is as important as prevention and response in effective landscape fire management" (FAO, 2019, p. 52).

7.2 Step-by-Step: What to Do After the Fire

The recovery process begins **immediately after the fire is extinguished** and should continue over the following weeks, months, and even years depending on the severity of the burn.

✅ Step 1: Assess the Damage

Table 24: Assess the Damage

Assessment Area	What to Check
Soil condition	Signs of erosion, ash layers, water runoff patterns.
Vegetation survival	Which plants are still alive, which areas are fully burned.
Tree damage	Burned bark, dead crowns, unstable or fallen trees.
Cultural sites and infrastructure	Cracks, heat damage, weakened walls or paths.
Wildlife signs	Tracks, presence of surviving species, habitat damage.

***Pro Tip:** Use **photos, maps, and GPS** to document the affected areas. This helps with planning and reporting.*

✅ Step 2: Protect the Soil – The First Priority

After a fire, **bare soil is at elevated risk of erosion**, especially on slopes. Without quick action, rain can wash away nutrients and ash into rivers and lakes, causing water pollution and further biodiversity loss (Certini, 2005).

Table 25: Protect the Soil – The First Priority

Soil Protection Technique	Purpose
Apply organic mulch (straw, wood chips, bark).	Covers soil, prevents erosion, retains moisture.
Install small contour barriers (logs, stones, straw wattles).	Slows down water runoff on slopes.
Sow quick-growing ground cover plants like clover (*Trifolium repens*).	Stabilizes soil, prevents weed invasion.
Avoid heavy machinery in the area.	Prevents soil compaction and further disturbance.

✅ Step 3: Assist Natural Regeneration

In many cases, **native plants will begin to regrow naturally**, especially species adapted to fire. Support this process by:

- **Monitoring which species recover naturally.**
- **Removing invasive plants** that may take over burned areas.
- **Leaving unburned patches untouched** as seed sources.
- **Protecting seedlings from grazing animals** using simple fencing where needed.

"Intervening too much after fire can sometimes do more harm than good—support natural recovery first" (Keeley et al., 2011).

✅ Step 4: Replant Wisely (If needed)

Where natural recovery is insufficient, especially in **severely burned or erosion-prone areas**, carefully planned replanting may be required.

Table 26: Replant Wisely (If needed)

Replanting Guidelines	Reason
Use native species only (adapted to local soils and climates).	Supports biodiversity and prevents invasives.
Select fire-resistant species for strategic zones (see Section 6.4).	Adds long-term resilience to fire-prone areas.
Prioritize mixed species planting rather than monocultures.	Increases ecosystem stability and diversity.
Plant outside the peak dry season (preferably in autumn or early spring).	Gives seedlings the best chance to establish.

⚠ ***Avoid fast-growing exotic species*** *that may increase fire risk (e.g., Robinia pseudoacacia, Eucalyptus spp.).*

✅ Step 5: Support Wildlife Recovery

Fire not only destroys plant life, but it also **removes habitat and food sources for animals**. Wildlife recovery actions may include:

Table 27: Support Wildlife Recovery

Action	Purpose
Install temporary water stations for birds and mammals.	Helps species survive during recovery phase.
Leave unburned refuges and dead wood intact.	Provides shelter and foraging sites.
Monitor wildlife presence and behavior post-fire.	Supports adaptive management and recovery plans.

🟠 7.3 Monitoring and Learning

Effective recovery requires **ongoing monitoring** and adjustments based on what is working or not.

Table 28: Monitoring Guide

What to Monitor?	How Often?	Purpose
Regrowth of vegetation (species, coverage)	Every 3–6 months.	Track recovery progress.
Soil stability (erosion, runoff)	After heavy rains and twice yearly.	Prevent long-term damage.
Invasive species presence	Quarterly during the first 2 years.	Early removal to support natives.
Wildlife return and habitat use	Seasonal checks.	Ensure ecosystem recovery.

Involve **youth ambassadors, schools, farmers, and volunteers** in monitoring activities as a learning opportunity.

✅ 7.4 Participatory Recovery – The Role of the Community

Recovery is most effective when **local people take ownership** of the process. Youth groups, farmers, and community leaders can contribute by:

- Assisting with **replanting and maintenance**.
- Participating in **invasive species removal actions**.
- Helping with **wildlife monitoring**.
- Sharing **observations and knowledge** with local experts.

Figure 9: Participatory Monitoring and Recovery Cycle



The recovery process benefits from continuous learning and participation. This cycle emphasizes observing conditions, recording data, sharing findings, taking corrective actions, and reflecting on results to improve future prevention and recovery strategies. Involving youth, farmers, and local leaders strengthens ownership and effectiveness.

Success Story: *In post-fire recovery efforts in Portugal and Spain, participatory approaches significantly improved restoration success and community engagement (FAO, 2019).*

🟢 7.5 Key Message: Recovery Is Healing—For the Land and the People

Helping the land recover after fire is not only about repairing ecological damage, but also about **rebuilding hope, reconnecting communities, and restoring balance between people and nature**.

"Recovery after fire is an opportunity to rebuild landscapes better, stronger, and wiser—reducing future risks while caring for the living heritage we share" (UNESCO, 2023).

---

8. Traditional Practices for Fire Prevention and Recovery

8.1 Why Traditional Knowledge Matters

For centuries, local communities across the Ohrid region and the broader Balkans have developed **traditional land-use practices** that contribute to fire risk reduction, sustainable land management, and ecosystem health. These practices are based on generations of observation, respect for nature, and adaptation to local environmental conditions.
Modern fire management science increasingly recognizes that **blending traditional knowledge with scientific approaches** enhances the success of prevention and recovery strategies (Gómez-Ibáñez, 2019; FAO, 2019). Involving local communities and respecting their cultural heritage strengthens both ecological resilience and social cohesion.

"Indigenous and traditional fire knowledge offers valuable lessons for modern prevention and land stewardship" (FAO, 2019, p. 56).

8.2 Traditional Practices Identified in the Ohrid Region

Through the documentation process conducted with local farmers, elders, and community members in the Ohrid region, several traditional fire-related practices were identified as important contributors to **fire prevention, ecosystem care, and cultural heritage preservation**.

✅ 1. Seasonal Grazing and Pasture Rotation

- Regular grazing by livestock (sheep, goats, cattle) reduces the buildup of dry grass and shrubs that function as fire fuel.
- Traditional **pasture rotation schedules** prevent overgrazing and allow vegetation recovery.
- Goats are used for targeted fuel reduction in steep or hard-to-reach areas.

Good Practice Example: *Controlled goat grazing in fire-prone zones has been successfully applied in Mediterranean countries to maintain fuel breaks and reduce wildfire risks (FAO, 2019).*

✅ 2. Sacred Buffer Zones Around Churches and Monasteries

- Local customs often maintain **open, clear spaces around sacred sites** such as small churches (*цркви*) and monasteries (*манастири*).
- These buffer zones, traditionally respected for cultural reasons, also function as effective **firebreaks**, reducing ignition risk near heritage structures.

✅ 3. Stone Walls and Terraces as Fire Barriers

- **Dry stone walls (сувомеѓи)** are widely used in agricultural landscapes to mark property lines and create terraces on slopes.
- These structures naturally **interrupt the spread of fire**, especially across grasslands and orchards.
- Terracing also helps prevent soil erosion and supports vegetation regeneration post-fire.

"The use of stone terraces integrates both erosion control and fire risk reduction" (UNESCO, 2023).

✅ 4. Planting Fire-Resistant Aromatic and Medicinal Herbs

- Farmers traditionally plant **aromatic herbs** such as rosemary (*Rosmarinus officinalis*), sage (*Salvia officinalis*), and lavender (*Lavandula angustifolia*) near homes and gardens.
- Some of these species, when properly spaced and maintained, can serve as **low-flammability vegetation barriers**, especially if combined with pruning and removal of dry biomass.
- Local use of **wild herbs** for household purposes encourages regular harvesting, which reduces biomass accumulation.

⚠ ***Note:*** *Some aromatic species can be flammable if unmanaged spacing, pruning, and regular harvesting are key to their safe use.*

✅ 5. Seasonal Calendars and Fire Awareness

- Knowledge of **seasonal cycles** (linked to religious holidays, planting and grazing seasons, weather patterns) guides when certain activities should or should not occur.
- Many farmers traditionally avoid burning, pruning, or clearing during **high-risk dry periods** like July and August.
- Oral transmission of fire-related rules, such as **"don't burn near the feast of St. Ilija"** (associated with summer storms), reinforces safe behavior.

✅ 6. Community Firefighting and Mutual Aid Practices

- Historically, **neighborhood groups and families assisted each other** during fire emergencies, sharing tools, livestock protection methods, and workforce.
- Simple water storage systems, beaters, and manual fire suppression were used to contain small-scale fires.
- Today, this tradition of **mutual aid** can be revived through youth groups, volunteer brigades, and local community plans.

🟠 8.3 Integrating Traditional Practices with Modern Fire Management

While traditional methods alone may not be sufficient in the face of modern climate-driven fire risks, they offer **valuable complementary strategies**. By combining these cultural practices with modern science, fire prevention and recovery efforts become:

✅ More community-centered and culturally accepted.
✅ Better aligned with local land-use patterns and ecological conditions.
✅ Supported by knowledge holders who actively participate in monitoring and decision-making.

Table 29: Integrating Traditional Practices with Modern Fire Management

Traditional Practice	Modern Complementary Action
Grazing and pasture rotation	Combine with fuel load assessments and mapping tools.
Stone terraces and walls	Integrate with GIS firebreak planning.
Sacred buffer zones	Include in official fire prevention zoning plans.
Aromatic herb planting	Use fire-resistant species lists and spacing guidelines.
Seasonal calendars	Combine with modern weather forecasting and fire risk alerts.
Community mutual aid	Formalize as **local volunteer firefighting networks** with training and equipment.

8.4 Respecting and Revitalizing Local Knowledge

The successful use of traditional fire-related practices depends on **recognizing, respecting, and revitalizing local knowledge**. Involving elders, farmers, and young people in documenting, teaching, and applying these practices fosters **intergenerational learning** and strengthens social cohesion.

"Traditional ecological knowledge is not static—it evolves and adapts when communities are engaged as partners, not just as beneficiaries" (Gómez-Ibáñez, 2019).

---

9. Leadership and Communication for Fire Prevention

9.1 Why Leadership and Communication Are Essential

Successful fire prevention is not only about having tools and technical knowledge, but also about **mobilizing people, sharing information effectively, and inspiring action**. Fires often spread due to human behavior, and preventing them requires changing behavior through **leadership, teamwork, and clear communication** (UNDRR, 2019).
Young people, farmers, teachers, and local leaders each play a role in promoting safe practices, raising awareness, and building resilient communities. When people trust messages and the messenger, they are more likely to act responsibly and cooperate.

"Leadership in disaster risk reduction is about creating connections, sharing knowledge, and motivating people to act together" (FAO, 2019, p. 60).

9.2 Who Can Be a Fire Prevention Leader?

Leadership is not about position or age, it is about **responsibility, initiative, and care for the community**. Effective fire prevention leaders can be:

- ✅ Youth ambassadors and students.
- ✅ Farmers and landowners.
- ✅ Teachers, scout leaders, and community organizers.
- ✅ Local government representatives or cultural heritage managers.
- ✅ Volunteer group members.

💡 **Leadership is about action, not title.** Anyone who encourages others to act safely is already leading.

9.3 Skills of Effective Fire Prevention Leaders

Table 30: Skills of Effective Fire Prevention Leaders

Skill	Why It Matters
Clear communication	Helps people understand risks and know what to do.
Active listening	Build trust by respecting community knowledge and concerns.
Positive role modeling	Demonstrate good practice through personal example.
Teamwork and collaboration	Ensured responsibilities and stronger results.
Planning and organization	Keeps prevention actions timely, coordinated, and effective.
Problem-solving	Enables quick adaptation when challenges arise.

Inclusiveness	Encourages participation from all community members, including women, youth, and vulnerable groups.

9.4 Tools for Effective Communication

Effective communication makes fire prevention messages **clear, understandable, and motivating**. Use a mix of traditional and modern tools for maximum outreach.

Table 31: Tools for Effective Communication

Communication Tool	How to Use It for Fire Prevention
Posters and flyers	The place is in schools, markets, cultural sites, and local shops.
Community notice boards	Share seasonal alerts, fire risk warnings, and safe behavior tips.
Social media (Facebook, Instagram, TikTok)	Run youth-led campaigns with creative posts, reels, and challenges.
Radio announcements	Reach rural and older populations with fire safety messages.
WhatsApp / Viber groups	Send rapid alerts and reminders within local networks.
Workshops and community meetings	Discuss risks, prevention actions, and recovery plans directly.

Youth Example: *Organize a* ***"Fire-Free Summer Challenge"*** *on Instagram, encouraging young people to share prevention tips through short videos or photos.*

9.5 Crafting Your Message: The Fire Prevention ABC

Good messages for fire prevention should follow the **ABC Rule**:
| **A = Accurate** | Use facts, not rumors or fear-based messages. | | **B = Brief** | Keep the message short and focused on key action points. | | **C = Clear** | Use simple language and avoid technical jargon. |

✔ *Example of a Good Message: "Do not burn waste outdoors—help keep our community safe from fires. Call 193 if you see smoke."*

✘ *Example of a Bad Message: "It's dangerous and bad and something could happen if people aren't careful."*

9.6 Youth Leadership in Action: Roles and Activities

Youth leaders can actively contribute to fire prevention through the following actions:

Figure 10: Youth Leadership Roles in Fire Prevention



Youth engagement is vital for successful fire prevention. Young people contribute as awareness creators, monitoring partners, communication helpers, event organizers, and community connectors. Shared leadership empowers youth to play an active and safe role in protecting their environment and heritage.

Table 32: Youth Leadership in Action: Roles and Activities

Youth Role	Activity Example
Awareness creators	Design and share social media content, posters, or videos.
Event organizers	Coordinate clean-up actions, workshops, or info booths.
Monitoring partners	Join or support local fuel load monitoring or firebreak checks.
Community connectors	Engage schools, farmers, and cultural groups in prevention efforts.
Emergency communication helpers	Assist with sharing evacuation messages if needed (non-firefighting roles).

"Youth participation increases community resilience by linking energy and innovation with traditional wisdom" (UNDRR, 2019).

9.7 The Importance of Teamwork

Effective fire prevention requires **shared leadership** and coordinated teamwork.

Table 33: The Importance of Teamwork

Good Teamwork Practices	Benefits
Define clear roles and responsibilities.	Avoid confusion, overlaps, or missed tasks.
Hold regular planning meetings.	Ensures communication and accountability.
Use shared tools like calendars, group chats, or shared documents.	Keeps everyone informed and aligned.
Celebrate successes and contributions.	Motivates continued participation and engagement.

9.8 Key Message: Lead with Care, Communicate with Purpose

In fire prevention, leadership is not about commanding others, it is about **building trust, sharing knowledge, and inspiring action**. Clear, honest communication combined with teamwork makes every effort stronger.

"Leadership is about empowering others to protect what we all share—our land, our culture, and our future" (FAO, 2019, p. 62).

---

10. Checklists, Templates, and Tools for Action

10.1 Why Use Checklists and Templates?

Fire prevention and response are easier and more effective when people know **exactly what to do, when to do it, and how to organize their actions**. Checklists and templates help:

- Avoid forgetting critical steps.
- Ensure consistency across teams and activities.
- Make communication and planning clearer and faster.
- Support monitoring, evaluation, and learning.

Checklists are especially helpful during **stressful situations** when people may otherwise overlook vital details.

"Checklists improve the reliability of disaster risk reduction actions and help ensure key tasks are not missed" (UNDRR, 2019).

10.2 Fire Prevention Checklist for Communities and Farmers

Table 34: Fire Prevention Checklist for Communities and Farmers

☑ Action Item	✔ Done	Notes
Cleared dry grass, shrubs, and ladder fuels near homes, fields, and infrastructure (minimum 10–30 m buffer zone).		
Pruned low tree branches (up to 2 m from ground).		
Waste managed properly—no open the burning, composting used where possible.		
Firebreaks maintained: width, vegetation control, erosion prevention.		
Fire-resistant plant species planted in strategic zones.		
Water tanks, hoses, and basic tools are available and functional.		
Access paths and evacuation routes cleared and usable.		
Community members informed about fire prevention actions and risks.		

10.3 Evacuation Preparation Checklist

Table 35: Evacuation Preparation Checklist

☑ Action Item	✔ Done	Notes
Emergency contact numbers posted and shared (Fire Service: 193).		
Evacuation routes planned and known by all household or team members.		
Basic emergency kit prepared (ID, medicines, water, flashlight, charger).		
Protective clothing ready (long sleeves, pants, boots, hat, mask).		
Vehicles fueled and parked facing exit routes if evacuation likely.		
Animals and livestock included in evacuation planning.		
Community members are aware of early warning signals and evacuation triggers.		

10.4 Fire Response Information Template

Table 36: Fire Response Information Template

Fire Location	
Date and time observed	
GPS coordinates or description	
Size of the fire (small/medium/large)	
Vegetation type burning	Grass / shrubs / forest / agricultural waste
Direction of fire spread	

Weather conditions (wind, humidity, temperature)	
People, homes, animals, or cultural sites at risk?	
Reported to (Fire Service, authorities)	Yes / No
Reporting person name and contact	

10.5 Youth-Led Awareness Activity Plan Template

Table 37: Youth-Led Awareness Activity Plan Template

Activity Type	Details
Awareness method (poster, video, clean-up, social media post)	
Target audience	
Key messages to communicate	
Team members and roles	
Materials and tools needed	
Date and time	
How success will be measured (e.g., number of participants, posts shared)	

10.6 Post-Fire Recovery Monitoring Sheet

Table 38: Post-Fire Recovery Monitoring Sheet

Location / Site	
Date of monitoring	
Vegetation regrowth observed (species, coverage %)	
Signs of soil erosion (yes/no, location, severity)	
Invasive species presence (species, area covered)	
Wildlife signs (species observed, tracks, nests, behavior)	
Additional notes or actions needed	
Monitored by (name, group)	

10.7 Emergency Contacts Table

Table 39: Emergency Contacts Table

Service / Person	Phone Number	Alternative Contact / Notes
Fire Service (North Macedonia)	193	National emergency line
Civil Protection / Municipal Office		Local authority for disaster coordination

Local health center / hospital		
Veterinary service (for livestock care)		
Local firefighting volunteer group		
Nearest neighbor / support contact		

10.8 Key Message: Plan, Check, Repeat

Good fire prevention is about **planning and consistency**. Checklists and templates are not just paperwork, they are **living tools** that help communities stay organized, ready, and safe.

"Simple tools like checklists make complex tasks easier and more dependable—especially under pressure" (UNDRR, 2019).

---

11. Conclusion and Closing Messages

11.1 Fire Prevention Is Everyone's Responsibility

The protection of the Ohrid region's rich natural landscapes, cultural heritage, and community well-being depends on **collective action and shared responsibility**. While fires may seem like a force of nature, the evidence shows that **most landscape fires in the region are human-caused—and therefore preventable** (San-Miguel-Ayanz et al., 2022; FAO, 2019).

Every individual—whether a farmer, student, youth leader, teacher, or landowner—has a role to play in:

- **Reducing risks through smart land management.**
- **Spreading awareness and correct information.**
- **Staying prepared for safe and effective response.**
- **Supporting the land and community in recovery after fire.**

"Fire prevention is not just a technical task. It is an investment in our future, our culture, and the health of our environment" (FAO, 2019, p. 65).

11.2 Youth as Leaders of Change

Youth are not only the future, but they are also the **present drivers of innovation, creativity, and action**. This manual encourages young people in the Ohrid region to:

✅ **Lead awareness campaigns** in schools, villages, and on social media.
✅ **Support monitoring and safe recovery activities.**
✅ **Build bridges between tradition and science.**
✅ **Work together with farmers, elders, and local authorities.**

By becoming **Youth Fire Prevention Ambassadors**, young people help to ensure that their communities stay safe, informed, and engaged.

11.3 From Prevention to Resilience

The steps outlined in this manual—prevention, preparedness, safe response, and recovery—are not isolated actions. Together, they form a **resilience cycle** that helps protect:

- **Lives and health.**
- **Local economies and livelihoods.**
- **Biodiversity and habitats.**
- **Cultural heritage and historical monuments.**

"Resilience is the capacity of people and systems to survive, adapt, and thrive in the face of risks—including fire" (UNDRR, 2019).

11.4 Final Takeaway Messages

- ✔ **Most fires are preventable.**
- ✔ **Prevention is easier and safer than firefighting.**
- ✔ **Fire risk increases during dry seasons and with poor waste or land management.**
- ✔ **Firebreaks, buffer zones, and proper plant choices have an influence.**
- ✔ **Stay calm and act smart if fire happens—your safety comes first.**
- ✔ **Recovery after fire is critical to help the land heal and avoid future risks.**
- ✔ **Leadership, teamwork, and effective communication save lives and landscapes.**

11.5 Together for a Fire-Free Ohrid

The beauty and richness of the Ohrid UNESCO region are shared gifts and so it is the responsibility to protect it. Together, through **knowledge, action, and cooperation**, we can keep the land, the people, and the culture safe from the devastating impacts of landscape fires.

"The best legacy we can leave is a safe, resilient, and thriving environment for the generations to come."
(UNESCO, 2023)

12. References

- Albrecht, C. & Wilke, T. (2008). Ancient Lake Ohrid: biodiversity and evolution. *Hydrobiologia*, 615(1), pp. 103–140. DOI: 10.1007/s10750-008-9558-y.
- Agee, J.K. & Skinner, C.N. (2005). Basic principles of forest fuel reduction treatments. *Forest Ecology and Management*, 211(1–2), pp. 83–96. DOI: 10.1016/j.foreco.2005.01.034.
- Bowman, D.M.J.S., Balch, J.K., Artaxo, P., Bond, W.J., Cochrane, M.A., D'Antonio, C.M., DeFries, R.S., Johnston, F.H., Keeley, J.E., Krawchuk, M.A., et al. (2009). Fire in the Earth system. *Science*, 324(5926), pp. 481–484. DOI: 10.1126/science.1163886.
- Certini, G. (2005). Effects of fire on properties of forest soils: a review. *Oecologia*, 143(1), pp. 1–10. DOI: 10.1007/s00442-004-1788-8.
- EEA (European Environment Agency) (2018). Forest fires in Europe, Middle East and North Africa 2017. Luxembourg: Publications Office of the European Union. Available at: https://effis.jrc.ec.europa.eu/static/media/uploads/FIRE_2017/FIRE2017_FINAL_REPORT.pdf [Accessed 20 April 2025].
- FAO (Food and Agriculture Organization of the United Nations) (2019). *Fire Management Voluntary Guidelines: Principles and Strategic Actions*. Rome: FAO. Available at: https://www.fao.org/3/i7488e/i7488e.pdf [Accessed 15 April 2025].
- FAO (2021). *Integrated Fire Management Toolbox*. Rome: FAO. Available at: https://www.fao.org/in-action/fire-management-toolbox/en/ [Accessed 20 April 2025].

- Fernandes, P.M. & Botelho, H.S. (2003). A review of prescribed burning effectiveness in fire hazard reduction. *International Journal of Wildland Fire*, 12(2), pp. 117–128. DOI: 10.1071/WF02042.
- Gómez-Ibáñez, D. (2019). The role of traditional ecological knowledge in forest fire prevention and management. *Ecology and Society*, 24(3), Article 5. DOI: 10.5751/ES-11012-240305.
- Johnston, F.H., Henderson, S.B., Chen, Y., Randerson, J.T., Marlier, M., DeFries, R.S., Kinney, P., Bowman, D.M.J.S. & Brauer, M. (2012). Estimated global mortality attributable to smoke from landscape fires. *Environmental Health Perspectives*, 120(5), pp. 695–701. DOI: 10.1289/ehp.1104422.
- Keeley, J.E., Bond, W.J., Bradstock, R.A., Pausas, J.G. & Rundel, P.W. (2011). *Fire in Mediterranean Ecosystems: Ecology, Evolution and Management*. Cambridge: Cambridge University Press.
- NFPA (National Fire Protection Association) (2021). *Community Wildfire Safety Toolkit*. Quincy, MA: NFPA. Available at: https://www.nfpa.org/Public-Education/Fire-causes-and-risks/Wildfire/Firewise-USA [Accessed 18 April 2025].
- Pausas, J.G. & Keeley, J.E. (2019). Wildfires as an ecosystem service. *Frontiers in Ecology and the Environment*, 17(5), pp. 289–295. DOI: 10.1002/fee.2044.
- Rodrigues, M., Jiménez-Ruano, A. & de la Riva, J. (2018). An insight into machine learning algorithms to model human-caused wildfire occurrence. *Environmental Modelling & Software*, 109, pp. 86–102. DOI: 10.1016/j.envsoft.2018.08.005.
- San-Miguel-Ayanz, J., Durrant, T., Boca, R., Libertá, G., Branco, A., de Rigo, D., Ferrari, D., Maianti, P., Artés Vivancos, T. & Costa, H. (2022). *Forest Fires in Europe, Middle East and North Africa 2021*. Luxembourg: Publications Office of the European Union. DOI: 10.2760/424002.
- Turco, M., Jerez, S., Augusto, S., Tarín-Carrasco, P., Ratola, N., Jiménez-Guerrero, P. & Trigo, R.M. (2018). Climate drivers of the 2017 devastating fires in Portugal. *Scientific Reports*, 8(1), Article 16129. DOI: 10.1038/s41598-018-31858-9.
- UNDRR (United Nations Office for Disaster Risk Reduction) (2019). *Words into Action Guidelines: National Disaster Risk Reduction Strategies*. Geneva: UNDRR. Available at: https://www.undrr.org/publication/words-action-guidelines [Accessed 16 April 2025].
- UNESCO (United Nations Educational, Scientific and Cultural Organization) (2023). *Ohrid Region Natural and Cultural Heritage Site Documentation and Risk Management Plan*. Paris: UNESCO. Available at: https://whc.unesco.org/en/list/99 [Accessed 18 April 2025].

13. Annexes: Tools and Templates for Action

Annex 1. Fire Prevention Action Checklist (Printable Version)

✓ Task	✔ Completed	Notes / Responsible Person
Dry grass, shrubs, and ladder fuels cleared near homes, fields, and cultural sites (10–30 m buffer zone maintained).		
Low tree branches pruned (up to 2 m from ground).		
Firebreaks checked and maintained: width, vegetation control, erosion prevention.		
Waste effectively managed: no open burning, composting of organic materials applied.		
Fire-resistant plants selected and maintained in buffer areas.		
Access paths and evacuation routes cleared and open.		
Water tanks, hoses, beaters, and tools are functional and ready.		
Community informed about risks and trained in safe practices.		

Annex 2. Evacuation Planning and Preparation Checklist

✓ Task	✔ Completed	Notes / Responsible Person
Emergency contact numbers clearly posted and shared.		
Evacuation routes mapped, marked, and known by household or team members.		
Emergency supply kit prepared (ID, medicines, water, flashlight, charger, protective clothing).		
Plan for animals and livestock evacuation prepared.		
Practice drill conducted (at least once per year).		
Early warning signals and evacuation triggers communicated to all members.		

Annex 3. Fire Reporting Template

Location of Fire	
Date and Time of Observation	
GPS Coordinates or Clear Description	
Size of Fire (small, medium, large)	
Type of Vegetation Burning	Grass / Shrubs / Forest / Agricultural Waste
Wind Conditions (direction, speed, any gusts)	
Nearby People, Homes, Cultural Sites, or Animals at Risk	

Reported To (Fire Service, Local Authorities)	Yes / No
Reporting Person (Name and Contact)	
Additional Comments	

Annex 4. Youth Awareness Activity Plan Template

Activity Type	**Example: Poster Design / Social Media Campaign / Clean-up Action / Workshop**
Target Audience	e.g., Students, Farmers, General Public
Key Messages to Communicate	e.g., "Stop Fires—Protect Our Future!" / "Don't Burn Waste Outdoors"
Team Members and Roles	List names and responsibilities
Date and Time of Activity	
Materials and Tools Needed	Posters, markers, camera, social media accounts, etc.
How Success Will Be Measured	Number of participants, posts shared, reach on social media, etc.
Support Needed (from teachers, local government, etc.)	

Annex 5. Seasonal Calendar for Fire Prevention and Maintenance

Month / Season	**Recommended Actions**
January – February	Firebreak inspection, early pruning, clearing dead branches.
March – April	Grass cutting, fuel load reduction, awareness campaigns.
May – June	Final firebreak checks before dry season; social media reminders.
July – August (High-Risk Period)	No burning, high alert monitoring, community patrols, waste removal.
September – October	Post-season evaluation, recovery planting (if needed), invasive species monitoring.
November – December	Planning for next year, community meetings, tool maintenance.

Annex 6. Emergency Contacts List (Printable Template)

Service / Organization / Person	**Phone Number**	**Alternative Contact / Notes**
Fire Service (North Macedonia)	193	National emergency line
Civil Protection / Municipal Office		Contact person and phone
Local Health Center / Hospital		
Veterinary Service		For livestock evacuation or care
Local Firefighting Volunteer Group		
Nearby Neighbor or Mutual Aid Contact		

Youth Group Coordinator (if applicable)		

Annex 7. Optional Monitoring and Learning Record Sheet

Date	Location	Observed Issue / Success	Action Needed / Taken	Person / Group Responsible