



7th International Wildland Fire Conference

Regional Statement of the Euro-Alpine Region – An Input Paper to the Conference Statement

30 October 2019

Introductory Remarks

Wildfires are an emerging issue in the Alpine region that can lead to high damages in protection forests, increasing natural hazards and resulting in high costs up to millions of euros for fire suppression and required restoration measures. The recent extremely dry and hot summers, e.g., 2013, 2015, and 2018, and the frequent dry winds during the winter season in absence of snow cover, evidenced the need to be better prepared in order to face the changing fire regime with more intense and frequent fires. In the Alpine region, 90 % of forest fires are caused by humans, 10 % are ignited by lightning strikes. Number of fires and burnt area per year varies strongly among countries. In general, the Southern Alps encounter more and bigger fires than the Northern Alps. The expected increasing intensity of drought periods, foehn periods and heat waves together with the increasing hazard resulting from rural abandonment and more recreational activities will probably increase forest fire activity in the Alpine region in the near future. Increased forest fire activity will, on the one hand, compromise the protection function of mountain forests and, on the other hand, highlight the need of properly managing the wildland-urban-interface (WUI). Current efforts to manage forest fires are unable to prevent the occurrence of extreme forest fire events. The implementation of a foresighted and integrated forest fire management for the Alpine region is highly needed.

Specific landscape fire problems of the region

The mountain forests in the Alpine region provide several ecosystem services to the people living in that landscape and have an important contribution to the protection function against natural hazards. The impacts of forest fires in the Alps can lead to new avalanche-prone slopes, a higher risk of rockfall, mudslides or soil erosion. Especially forests dominated by coniferous tree species on southern slopes are at risk, which often play an important protective role against gravitate hazards. The abandon of grazing activities can lead to an increase of fine dead fuel increasing the probability of ignition by lightning in remote areas. Firefighting is generally difficult in the Alpine region due to topography and the accessibility is often low in remote areas. Furthermore, costs of firefighting and civil protection measures, as well as restoration efforts after fires and necessary protective measures may rise dramatically.

In short, the negative impacts of forest fires in the Alps can be summarized as:

- Destruction of the protection function of mountain forests
- Increased vulnerability to natural hazards
- Loss of natural resources and decreased productivity through increased soil erosion
- High costs for firefighting and post-fire measures
- Increasing danger for humans and infrastructure at the wildland-urban-interface
- Increased air pollution and carbon release

Gaps / shortcomings in landscape fire science, management and policies

Fire danger assessments in such small-scaled landscapes like the European Alps encounter several difficulties. While a spatial resolution of 1x1 km is state of the art of regional weather models, this resolution is insufficient when considering narrow valleys, mountain peaks and the corresponding effects of temperature, precipitation, wind and solar irradiation on northern and southern slopes. This leads to an inadequate picture of estimated surface fuel moisture, the crucial part in potential fire ignition. Another critical point of currently used fire danger models in the Alpine region is their inappropriate suitability for the winter season and early spring. South-sided slopes are snow-free earlier as a consequence of higher temperatures and stronger solar radiation. Together with dead fine organic material from the last year (e.g. grass, litter), this results in an earlier and higher risk of forest fire ignition than on northern slopes.



The occurrence of inversion weather conditions with higher temperatures and dryer conditions above the fog cap and the resulting difficulty of estimating forest fire hazard based on station data from the valleys is an issue in the Alpine region.

It is essential to integrate actual scientific knowledge in forest fire management planning, e.g., by shifting tree species composition to increase the resistance and adaption potential of forests to fire. The evaluation of current fire management strategies as well as the discussion on quantifying positive and negative fire effects and assessing fire damage would be needed as well. In any case more financial and personal resources are needed in fire science and fire management as currently available.

Main advances achieved since the last International Wildland Fire Conference

The federal ministry of Sustainability and Tourism of Austria has launched a project called “Forest fires in the Alps: State of knowledge and future challenges” in cooperation with the University of Natural Resources and Life Sciences, Vienna (BOKU), and the members of Action Group 8, situated in EUSALP, the EU Strategy for the Alpine Region. Several fire experts from all Alpine countries (Slovenia, Italy, France, Switzerland, Liechtenstein, Germany, and Austria) were involved to analyze the occurrence, impacts, legal bases, and main challenges of forest fires across the Alpine region. As a starting point, a multi-lingual online survey was spread among experts on forest fires, including scientists, members of action forces, and authorities, from all Alpine countries. The results of the survey were analyzed and discussed among the experts in a two-day workshop held in June 2019 in Vienna. The discussions during the workshop, including the identification of success stories on fire management in the Alpine region, were used as starting point to draft a White paper for policy makers. The final version of the paper will be promoted at the end of 2019 focusing on the key elements of integrated fire management.

Since the last International Wildland Fire Conference, there have been many research contributions that have led to an improved understanding of fire disturbances in the Alps. Some examples of the work done:

- Pyrogeographic characterization of the Alpine region (Conedera et al., 2018)
- Assessment of tree mortality after a forest fires under different climatic conditions in the French Alps (Dupire et al., 2019)
- Characterization of the understory flammability of different forest ecosystem types of the western Alps (Fréjaville et al., 2016)
- Effect of forest fires in beech (*Fagus sylvatica*) stands in the southwestern Alps on soil stabilization (Gehring et al., 2019) and on the forest protective capacity against rockfall (Maringer et al., 2016a)
- Characterization of lightning fires in the eastern Alps (Müller and Vacik, 2017)
- Spatially-explicit modeling of fire ignitions to assist development of fire management plans (Vacchiano et al., 2018)
- Decay of root reinforcement in a burnt Scots pine (*Pinus sylvestris*) protection forest (Vergani et al., 2017)
- Waldbrände: Vorbeugen ist besser als heilen (Incendies de forêts: mieux vaut prévenir que guérir) special issue of Schweiz Z Forstwes by Conedera and Pezzatti (2019)

In reference to the recommendations of the 6th IWFC and the results of activities between the 6th and the 7th IWFC we were able to intensify the collaboration in fire research and continue with the monitoring activities between 2015 and 2019. The activities in the EUSALP workinggroup are a follow up activity of the former ALPFFIRS project and will help to strengthen the network further.

Proposals for solutions / action to be taken

We propose a framework for an integrated fire management, which addresses the drivers of the current and future fire regime in mountain forests, considers the needs of humans living in the Alpine region and aims to mitigate the negative impacts of fires. The framework includes the following recommendations and proposed actions:



Recommendation: Design and implement long and short-term prevention measures:

Proposed actions:

- Improve early warning systems considering the topographic specifics and site conditions of the Alpine region
- Increase resistance and resilience of forests by promoting site adapted tree species
- Anticipate the effects of natural hazards increasing fuel management activities
- Improve forest management planning in considering fire dynamics
- Foster awareness-raising activities in order to establish a “fire culture” in the Alpine region

Recommendation: Adapt the suppression measures to the specific conditions of the Alpine region:

Proposed actions:

- Improve the knowledge about adequate forest infrastructure
- Promote deployment of specialized action forces
- Adapted firefighting techniques using technical fires in suppressing strategies
- Quick and efficient air support

Recommendation: Improve the understanding about post-fire measures:

Proposed actions:

- Restore forest cover using technical measures
- Minimize risks of fire effects and natural hazards
- Continuous monitoring of burnt sites
- Investigate studies on fire behavior
- Establish case studies to monitor mortality and regeneration processes

Recommendation: Support knowledge transfer and exchange of experiences:

Proposed actions

- Establish a multi-stakeholder approach among authorities, action forces and scientists
- Conduct transnational trainings of fire brigades and action forces
- Continue with collaboration in forest fire research in the Alpine countries
- Organize international workshops
- Address negative effects of rural abandonment
- Use joint terminology

Conclusions and recommendations

To cope with the changing future fire regime in the Alpine region, the following key elements for an integrated forest fire management are recommended:

1. Adopt a multi-stakeholder approach on a transnational and collaborative basis
2. Improve the training of fire brigades and specialized action forces
3. Address and minimize negative effects of rural abandonment
4. Improve post-fire restoration activities
5. Improve awareness-raising activities for stakeholders and the population
6. Facilitate integrated forest fire management and planning
7. Establish knowledge transfer and transnational exchange activities
8. Minimize the risks of natural hazards after forest fires

References

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