

**Table S1.** Fire protection situations in disturbed areas or spontaneously developed forests in Central Europe based on questions addressed to the co-authors representing respected local authorities in forest fire protection.

QUESTIONS	CZECH REPUBLIC	SLOVAKIA	GERMANY	AUSTRIA	POLAND
<b>Have your country some protected areas with no-interference forest management/ spontaneous (free) development of forest?</b>	Yes, Bohemian Switzerland National Park, Šumava National Park, and some small protected areas.	Yes, there is a nature protection system divided into 5 degrees within the fifth degree is represented by spontaneously developed areas.	Yes. 16 national parks, but not all are forested. In addition there are several „free development“ areas of nature conservation associations like DBU (Deutsche Bundesstiftung Umwelt)	Yes. 6 National Parks with the core zones, 192 natural forest reserves,	Yes. There are 24 national parks in Poland (the highest form of protection). On their territory there are separate areas of active, strict and landscape protection.
<b>Can you specify the size of these zones without management?</b>	22,000 ha in total for now. There is a zonation in National parks and only part of the area should be unmanaged based on this zonation. These internal rules of the national parks however are not fulfilled and unmanaged areas are becoming bigger.	Now, it is 99,500 ha representing 2.03 % of the country's area. It is now about 20 % of the National park's area and it should be extended to 50 % in the future.	593,000 ha, it is 5 % of forest area.	NP Donauauen-9,300 ha (6,500 ha Naturzone), NP Kalkalpen-20,850 ha (18,500 ha Naturzone), NP Gesäuse-12,382 ha, NP Hohe Tauern-185,600 ha (121,300 ha Kernzone), NP Neusiedler See Seewinkel-9,000 ha (4,500 ha Naturzone), NP Thayatal-1,360 ha (1,231 ha Naturzone), natural forest reserves -8,355 ha	The area of national parks is 314,510 ha, which is about 1 % of the country's area. There are 1,505 nature reserves, covering an area of about 171,201 ha. The strict protection (without management) is specified in every protected areas in Poland based on zonation.
<b>Has your country ever faced some forest fires in these areas?</b>	Yes, Bohemian Switzerland National Park (2022) – 1,060 ha	Yes, for example: High Tatras National Park – (2018) – 30 ha Low Tatras National Park – (2019) – 15 ha	Yes, in several areas, for example: Sachsen Switzerland National Park (2022) – 500 ha Harz Mountains National Park (2022) – 300 ha	Yes, for example: NP Kalkalpen (2003) - 15 ha Natural Forest Reserve Potokkessel (1998) - 15 ha	The risk of fire in disaster areas is always high, there have been small fires, but so far there has been no large fire in areas damaged by insects or strong winds.
<b>Does your country have some specific law or regulation – how to prepare these protected areas (no-interference management) for forest fire or how to minimize the probability of its origin?</b>	No, we have no any law, regulation or management principles how to do fire protection in these areas.	No, some fire protection guidelines after wind disturbance were written but never transformed into law regulations or practice.	No fire specific regulations in place. We have concepts for bark beetle protection etc. but not yet for fire.	Besides the forest act (§ 40. Forstgesetz 1975 – Abschnitt Forstschutz, Schutz vor Waldbrand) we do not have a specific law, how to minimize the probability of fire ignition in these areas.	Detailed regulations do not exist, but experiences from other catastrophes in forest stands are practiced and the so-called "good practices" are implemented. Various treatments are carried out, for example, during afforestation, to make the forest

					resistant to the influence of strong winds.
<b>Do you think that your country could have specific rules for forest fire protection in protected zones?</b>	Yes, absolutely. We have to made tools how to prevent fires, or how to appropriately prepare in case of its origin.	Yes, absolutely. Some fire protection guidelines in these areas focused on how to prevent and suppress forest fire. But these guidelines must be obligatory for everyone.	Absolutely. The development of fire prevention or fire management approaches is high on the agenda now. A special focus needs to be on buffer zones around the areas (like bark beetle buffer zones) and the spatial management of dead wood, for instance along roads (allow in area, but reduce alongside roads)	Yes, it would be possible. Currently all fires are suppressed by the fire fighters, there is no intention to let them burn. The forest ecosystems in Austria do not require a repeated burn by natural fires, fires are seen as a disturbance in this respect.	I think the current regulations are appropriate. Accurately describing some issues may not be optimal during a disaster.
<b>Has your country ever faced some huge windthrow or bark beetle outbreak? Does your country have some specific law, regulation – on how to manage forests after bark beetle outbreak or windthrow outbreak in relation to fire protection?</b>	Yes. There is a various number of small damage by wind and some big one like Kyrill in 2007. Czech Republic is massively affected by barkbeetle outbreak for last few year. There is no specific law, regulation, management principles how to manage these disturbances in relation to fire protection.	Yes, Slovakia faced wind disturbances many times. Bark beetle outbreaks were common in all areas, where timber processing was not allowed by the Ministry of the Environment. From the period 1993-2012 in High Tatras, Low Tatras, Orava, Spiš, Gemer it was 23.1 mil cubic meters of timber. There was an annual increment in 2020 of only 1.7 mil cubic meters of timber with decreasing trend every year.	Yes. Large storms and large bark beetle outbreaks have prompted the regulations to be more developed and concepts how to deal with pest and storms are developed. For fire this is not yet the case.	Yes, we have in the forest act specific regulations, how to deal with bark beetle attacks, how to perform salvage cuts. Some specific regulations are applied in protected areas.  No recommendations are currently available regarding management of forests after bark beetle outbreak or windthrow outbreak in relation to fire protection.	In recent years, the greatest damage to tree stands took place in August 2017. The tree stand on the area of about 100,000 hectares was destroyed. Dead biomass was systematically removed from these areas. In the forests of the Białowieża Forest, some of the stands were damaged by the bark beetle, the beginning of which took place in 2012. As a result of social discussions, part of the biomass remained undischarged, which resulted in a significant increase in fire risk. Regarding the rules, the answer is above.
<b>Your important comment summarizing the above issues.</b>	Importance of fire protection must start to increase because of climate change and increasing vulnerability of forests to fire also in Central Europe	The aforementioned parks had the goal of protecting forest stands resulting from 300 years of work by foresters who were able to reforest the clearings created after mining and metallurgical activity. Afforestation was mostly done with spruce monoculture originating from the Alps. The function of these forests was managed for timber production. Leaving these forests	The combination of climate change and forest / landscape management in terms of fuel characteristics needs to consider fire as a new more widespread phenomenon. Especially the interlinkages between drought, bark beetle, storm and fire need attention.	Wildfires are an emerging issue in the Austrian Alps that can lead to high damages in protection forests, increasing the risk of natural hazards and resulting in threats to people and high costs – up to millions of euros for fire suppression and restoration measures. Spruce-dominated forests at lower altitude forests are already suffering from climate change and the related	Fire protection in forests must be an important issue in order to reduce losses during local and regional threats caused by abiotic factors and human activities.

		freely develop without its managing, including protection against insects, entails their gradual liquidation, which is also confirmed by the consequences of barkbeetle, snow, and wind disasters.		impacts (e.g. bark beetle, storm damages) and they will become even more affected if temperature and dryness rise as expected. This can lead to fuel accumulation which will increase the fire hazard and impact the provision of ecosystem services dramatically.	
<b>Please provide useful publications/ references about your country in this regard.</b>	PECL, Jan, Roman BERČÁK a Jan VANĚK. <i>Hašení požárů v přírodním prostředí</i> . Praha: Ministerstvo vnitra, 2021. ISBN 978-80-7616-098-9. (only in Czech language)	Hlaváč, J; Chromek, I; Majlínková A; Osvald A (2009): Od Projektu protipožiarnej ochrany lesa vo Vysokých Tatrách po vetrovej kalamite po zmeny legislativy v oblasti ochrany lesov pred požiarimi v podmienkach Slovenskej republiky; Slovakia: Technical university in Zvolen. ISBN 978-80-228-1976-3 (only in Slovakia language)		Vacik, H; Müller, M.M. (2021): Waldbrandprävention, -bekämpfung und Nachbehandlung von Waldbrandflächen. In: Freudenschuß, A; Markart, G; Scheidl, C; Schadauer, K (Hrsg.), Schutzwald in Österreich - Wissensstand und Forschungsbedarf, 80; BMLRT, Bundesforschungszentrum für Wald, Wien; ISBN 978-3-903-258419.	Kwiatkowski M, Szczygiał R., Kołakowski B. Opracowanie programów zabezpieczenia przeciwpożarowego terenów pokłeskowych dla Nadleśnictw: Czersk, Przymuszewo, Ryteł i Szubin (Development of fire prevention programmes for the post-disaster areas the forest districts in : Czersk, Przymuszewo, Ryteł and Szubin.). Manuscriptkrypt. (only in Poland language)