Forest fire protection in Europe

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Introduction

Forests have always welcomed people with their magical atmosphere, peacefulness and mystery. They have been the basics on which rightful functioning of the world relies. We can call it the ally of mankind and also the foundation that has to be taken care of in order to survive.

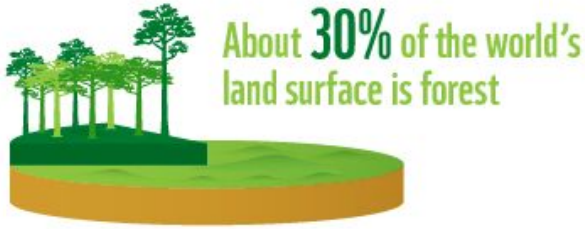
One of the threats generating the biggest cost is forest fire which is an uncontrolled process of biomass burning on forest land in place unallowed for that. According to the definition operative in European Union forest fire begins and spreads in forest and other wooded area or begins on another territory and proliferates.

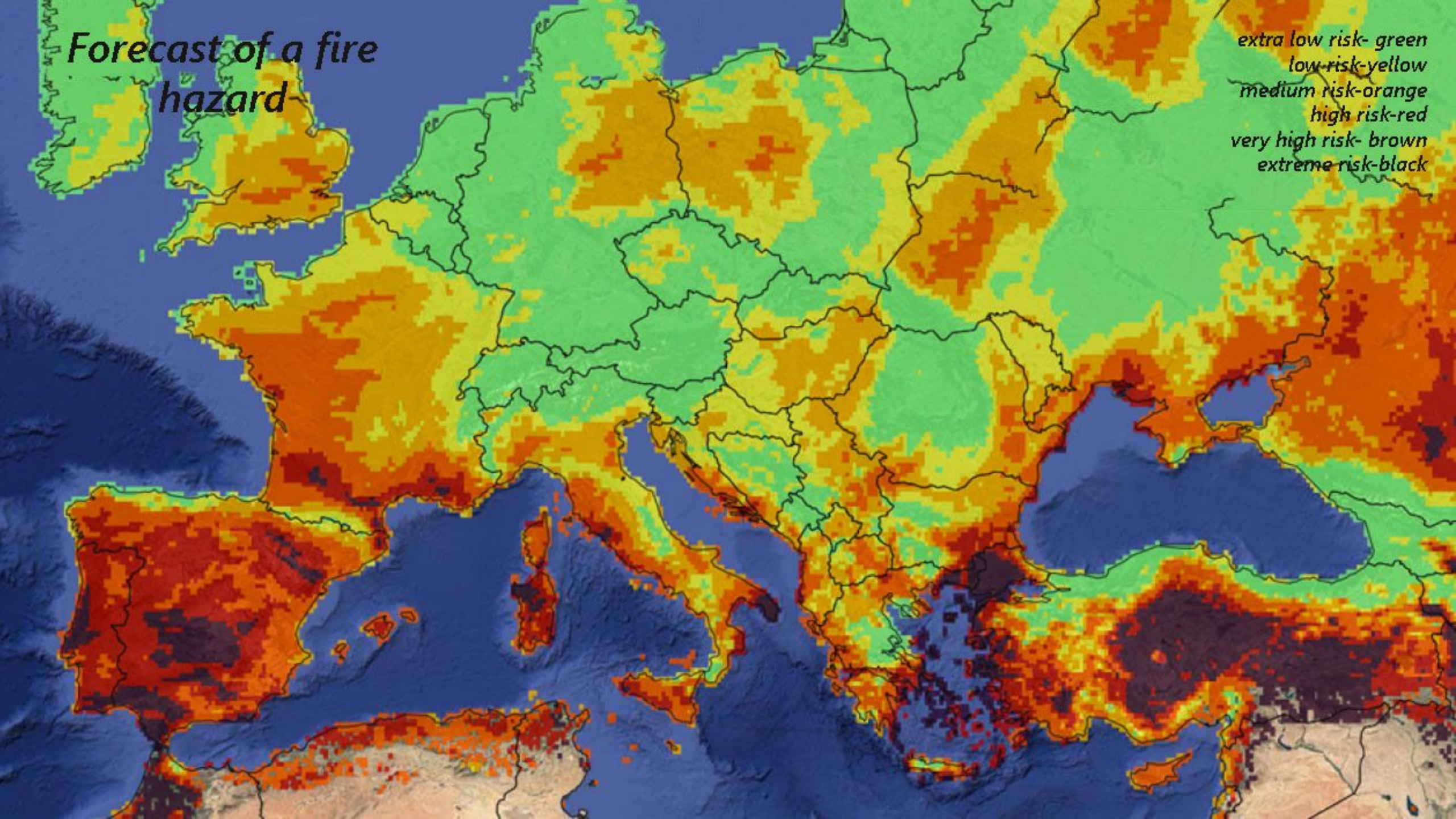
Forests occupy over 28% of inhabited surface of continents. Most of them we can find in South America (41% of forests area). The least amount of forests are in Australia. But when it comes to Europe we can observe huge variation between particular countries eg. in Finland over 70% of the land is covered in forests but in Iceland only 1%.

Meaning of the forest

The importance of forests cannot be underestimated. We depend on forests for our survival, from the air we breathe to the wood we use. Besides providing habitats for animals and livelihoods for humans, forests also offer watershed protection, prevent soil erosion and mitigate climate change. Yet, despite our dependence on forests, we are still allowing them to disappear.

Just think of how forests have affected your life today: have you had your breakfast? Read a newspaper? Switched on a light? Travelled to work in a bus or car? Signed a cheque? Made a shopping list? Got a parking ticket? Blown your nose into a tissue? Forest products are used in our daily lives. But looking at it beyond our narrow, human, not to mention urban, perspective, forests provide habitats to diverse animal species, and they also form the source of livelihood for many different human settlements as well as for governments.




Forecast of a fire hazard
extra low risk- green
low-risk-yellow
medium risk-orange
high risk-red
very high risk- brown
extreme risk-black

Poland

About 83% of the forest resources in Poland are subjected to fire risk and the forest fire risk increases continually. This presentation discusses the causes of increase of the forest fire danger. The existing methods of the forest fire danger classification that developed in Poland and the last changes in the field have been considered too.
We also demonstrate some statistical data of the fires on high forest (number of fires, area burned, average area of fire, fire causes) in Poland's post-war fire history. Current changes in the causes of occurrence of the forest fires have been determined. The fire dangers in the state forests and in the privately owned forests have been compared. The forest fire danger increases particularly in the privately owned forests. These forest areas are not well prepared for the event of fire and firefighting.

About 83% of all forest resources of Poland are potentially threatened by fire (the respective average figure for the whole of Europe is 65%). Thus, with an area of 7.4 million ha at risk the danger is extremely high. The actual scale of the problem is a result of the prevailing abiotic, biotic and anthropogenic pressure over the area of the whole country. Human error, ignorance or lack of responsibility constitutes a huge threat as well. The cumulative effects of several unfavourable factors makes the forest less vital, thus increasing its vulnerability to fire initiation and facilitating its spread.

The forest in Poland is occupying predominantly the area of the relatively poorest soils and is characterized by a large portion of coniferous forest sites (60%) where often even-aged Scots pine (*Pinus sylvestris*) monocultures occur. Such a situation results in large areas and volumes of highly flammable materials and favours the establishment of vegetation-free and "dead" upper soil layers.

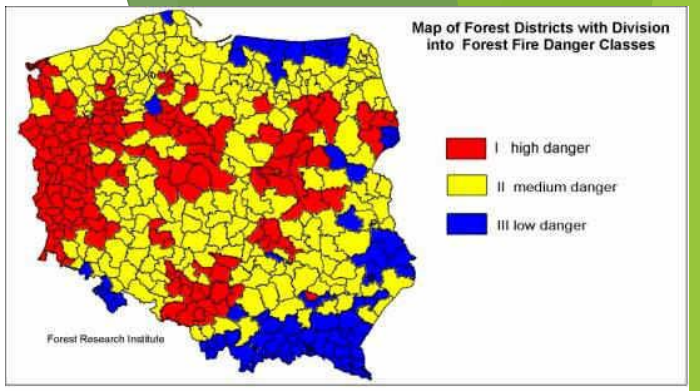


Fig. 2. Map of Poland with Forest Districts with Division into Forest Fire Classes

Conclusion and protection

Considering the membership of Poland in the European Union, several tasks have to be accomplished in order to meet the EU standards like modernization of forest roads or developing the water supply system.

The fact that the absolute majority of Polish forests are under administration of a single organization, the State Forests, allows for both effective management and prevention against fire and firefighting. The financial resources available, however, are still insufficient considering the actual situation. The role of financial aid programs of the EU has been an important help. Funds obtained this way continue to be helpful in financing many projects of technical support, e.g., in fire-danger forecasting and monitoring of forests, and for purchase of fire suppression equipment. Another very important topic will be the international collaboration in the field of meteorological cover and forest fire forecasting.

The system contains, among others, the following solutions in the field of fire protection of forest area:

- criteria and principles of classification of forest stands and forested areas to particular classes of forest fire risk,

- the methods of assessment of forest fire risk

- the principles of the information-warning activity,

- the organizational-technical background of preparation of the organizational units of state forests for fire suppression in the fields of the observation-warning system of fire detection, containing for instance: the network of permanent observation, fire control patrols, airplane patrolling, alarm-command points.

Croatia

Croatia, thanks to its specific geographical location, is partly lowland, montane and maritime. Various climatic influences are twining there creating miscellaneous landscape. Plant and animal species are very diverse.
Thanks to its uniqueness and natural value some areas are now on the lists of precious zones of international importance. In this way the Hvar Island can be found on the UNESCO list.

Croatian State Forests are the oldest state-run institution in Croatia and one of the oldest in Europe. Croatia is the country of wonderful landscape with eight national parks and eleven nature protection parks.

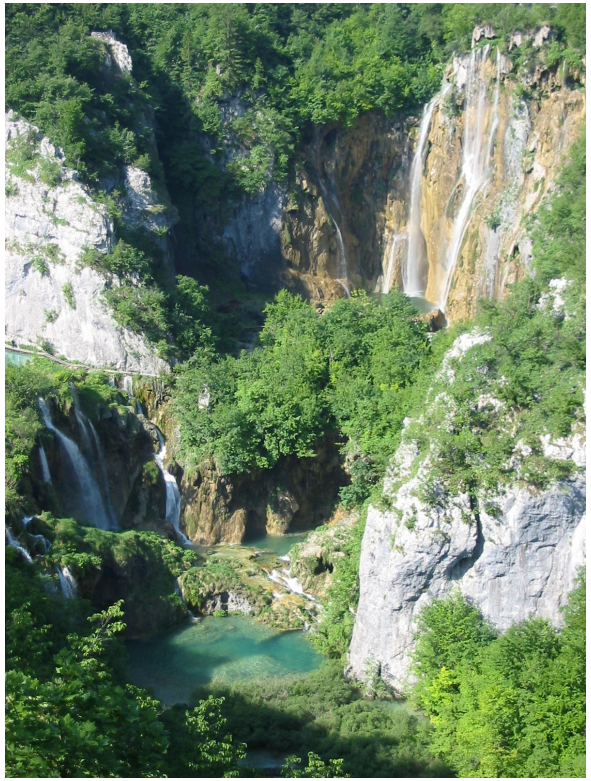
Over 34% of the country's area is covered by forests, in which the biggest threat is forest fire. The fire destroys the ecosystem and infrastructure and is dangerous for human life. Besides preventing forest fires the only effective way limiting fire spread is detecting its early signs and fast response.

Hvar Island

Fire in Trstenik, July 2015

Croatian landscape

Krka National Park



Plitvička Lakes

Pakleni Islands

Brač Island

Finland

Finland is one of the most forested countries in Europe. Around 65 per cent of Finland's total land area is covered in forest. Pine, fir and birch trees are significant features of the landscape. Forests are like water in Finland: ever-present, including in the major cities.

Almost all protected areas in Finland have been established to protect biodiversity. It is frequently thought that these areas are also good for recreation, but this is not always the case. Forests are really important for Finns so they take care about this natural treasure.

Fire fighting in Finland is regulated by the Ministry of the Interior. In Finland, there are 38 alarm centres, four of which are the so called combined alarm centres, 18 automatic alarm centers and 16 manual alarm centers.

The combined alarm centers are automatic centers and handle alarms for police, ambulance and fire alarm altogether while the other centres handle fire alarms only. Municipalities of Finland can choose whether the fire and rescue services are provided by a professional fire brigade, a half-ordinary fire brigade

Half-ordinary and voluntary fire brigades rely on non-professional voluntary fire fighters who have been trained appropriately. In Finland, a fire risk warning is issued to the public under dry weather conditions from May to September. The fire risk is based on estimates of the volumetric moisture content of the top organic soil layer including fallen litter and small branches. The decision is made by a duty meteorologist at the Finnish Meteorological Institute based on current weather information and current and forecast fire index values, especially developed for this purpose.

Forest in Finland

France

France is one of the most fire-prone countries in Europe. For the most fire-prone areas of France, i.e the Southern Departments with a typical Mediterranean climate, the area burned by wildfires has been remarkably low since 1991.

This has been the longest period ever registered since data became available on fire-affected land. Although this phenomenon may be partly explained by fire prevention strategies and stringent cooperation among the different public services, it is obvious that moderate weather conditions have shown a positive impact.

Definition of the forest in France

Forest - wood formations with a canopy cover of more than 10%,plantations, heath, macchia, garrigue. They cover 15 075 ha so it's 27.7% of the territory. Forest fire - is the fire that affects a forest, heath, garrigue, or maccia with a size of a least one hectare and of one owner regardless of the burned area. The term "affect" implies that at least parts of the shrubby or woody layer have been destroyed.

In the 1994 fire season in France the number of fires and the area burned were distinctly reduced, with 2,538 fires affecting about 21 ha forest compared with the decennial average of 30,600 ha caused by 3,000 fires in 1980-90.

Fire protection measures have been made more efficient by improved meteorological prediction and risk assessment. These actions were combined with supply of heavy equipment efforts in different forest regions with the help of the Conservatoire de la Forêt Méditerranéenne (C.F.M) in southern France and the European Union. This association regroups the fifteen French Departements with a Mediterranean climate. Its objectives are to inform the public, test new fire fighting equipment and train specialists. The result: 80% of the fires were smaller than one hectare and 95% of the fires were smaller than five hectares.

Information about the action programme (MED-FAP)

Initiated by the FAO in 1992, this programme has the objective to initiate activities to fight against different forms of degradation of the Mediterranean forest (erosion, fire, etc.). It provides a general conceptual framework from which each concerned country defines its strategies to reach the envisaged objectives. The bases of the MED-FAP remain relevant for the new frame of forestry action plans that are presently promoted by the international community.
The concerned country is France but not only. There are also countries like Afghanistan, Bulgaria, Egypt, United Arabian Emirates, Spain, Greece or Italy.
Why do they want to protect themselves? In the Mediterranean climate, defined as a ‘’red’’ zone of high fire risk, fire detection is primarily based on a system of fire towers throughout the region. In the temperate areas of France (‘’orange’’ zone of average fire risk) fire detection is more extensive and primarily based on fire towers.

The volume “Forest Fire Protection” has not only been appreciated in France, but also abroad. The Food and Agricultural Organization of the United Nations (FAO) therefore encouraged the publication of an international handbook, based on the French volume and adjusted to the conditions of other countries of the Mediterranean basin

In gray, the countries where the project partners are located and in red, the project test areas

Risks and dangers

There are many physical and legal risks facing forest owners today, however most are manageable. Risk areas are associated with fire, environment, health & safety, access and security.

There are many potential hazards involved in forestry work and you need to think about both your work practices and equipment when identifying things that could go wrong.

Safe harvesting of timber by either mechanical or manual depends on hazard elimination or risk reduction actions (e.g. against fire) at the planning stage before work commences, to provide the highest level of protection for the worker.

The hazards involved in each of these activities—and the risk controls required to eliminate or reduce them—are described in detail in the forestry Industry Standard.

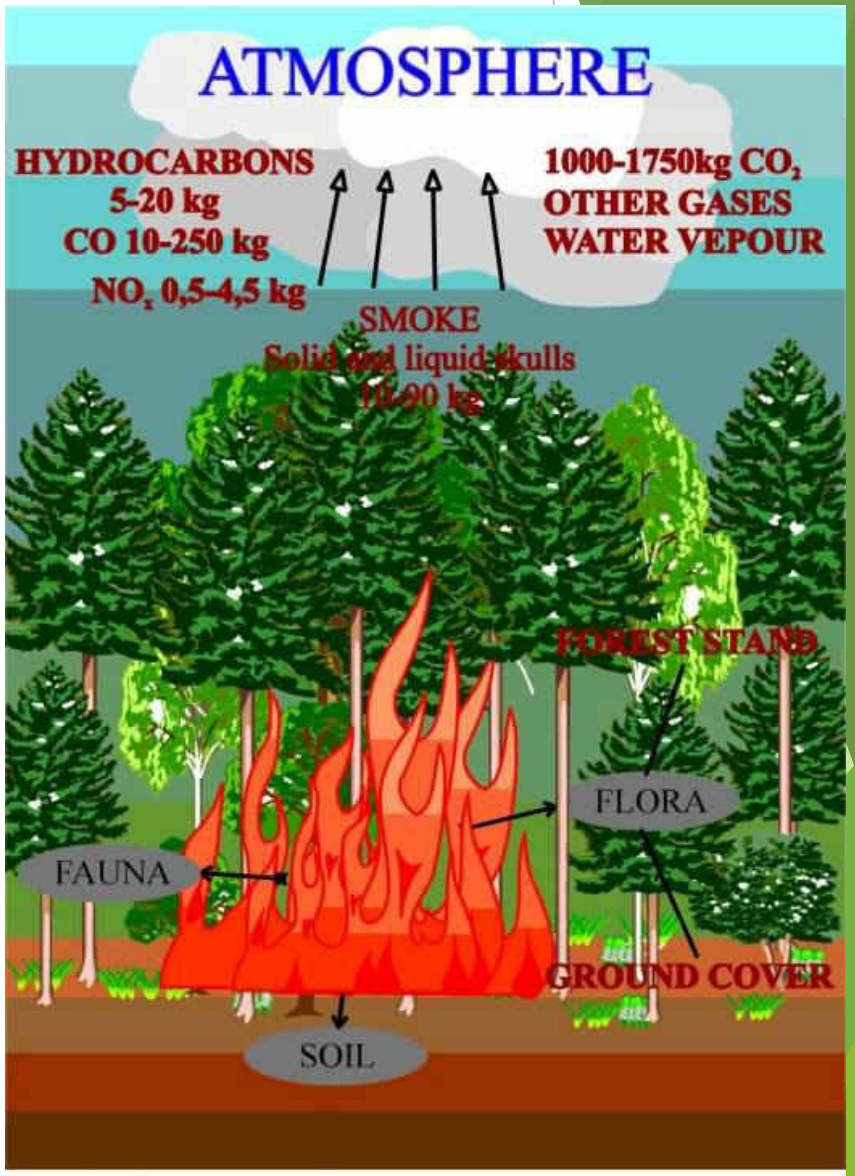


Fig.5. Fire effects on the natural environment

Fire protection in a nutshell

Fire protection systems are designed, installed, tested and maintained to ensure water

- which may come from water tanks, main water connections, dams or reservoirs
- can be reliably used to control fire until emergency services personnel arrive.

The existence and correct design and installation of fire protection system are critical for protecting people, buildings and assets from a fire.

Fire protection plumbing work relates to:

- - hydrants and hose reels
- - residential and domestic fire sprinkler systems
- - commercial and industrial fire sprinkler systems
- - fire system pumpsets.

It can be concluded that there is great diversity of descriptors to assess the damage generated by the passage of a fire. The choice of the criteria assessing deterioration is all the more difficult since there is a great variability of reaction to fires varying from species to species. The parameters to be retained for the diagnosis can be different according to the forest species. This variability, moreover, is accentuated by other factors, like the physiological state of the tree at the time of the fire occurrence, the site characteristics. Essential is, however, to facilitate the work of the manager in charge of the diagnosis, by using easily measurable variables on the ground.

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