

# Causes of forest fires in the North Slovakia – Žilina Region in 2007-2009

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**Abstract.** Fire, as a dangerous hazard, can damage the mountain environment, especially forest ecosystems. If we want to avoid this, we have to know the causes of forest fires and the most common locations where these fires occur. This paper contains data about forest fires in 2007-2009 in the Žilina region, where there are many protected areas, e.g. Malá and Veľká Fatra National Parks. From certified data about forest fires, their locations of forest and the number of forest fires in particular months of the year, an information bank for fire units has been prepared and can support prevention in protected mountain areas.

*Key words:* forest fire, the causes of forest fires, information support, burning of wooden biomass

## Introduction

The forest fire is a sudden, partially or completely uncontrolled, time and spatially bounded, extraordinary occasion which has a negative influence on all functions of the forest. It causes direct and indirect damage to the forest ecosystem and, according to its origin, is an anthropogenic or natural harmful factor (Blaško 2008).

Various types of forest fires are known; ground (ground cover, wooden waste, shrubs), underground (under the surface, hard to locate) and tree-top forest fires.

Fire-influencing factors are tree patterns (deciduous trees have higher resistance in comparison with coniferous ones), soil substrate (quantity and thickness), slope gradient, aspect of slopes, surface segmentation, presence and distance of water sources.

The main aim was to provide data about the main causes of fires in forest ecosystems in the Žilina region and to create information support (database) for fire units of the Žilina region whose sphere of competence encompasses protected areas of national and European significance (e.g. Tiesňavy National Protected Reservation located in the Malá Fatra National Park).

## Materials and Methods

Data needed for the forest fire statistics of the Žilina region were taken from the Fire-technical and Expertise Institute of the Ministry of the Interior of the Slovak Republic in Bratislava. The paper is focused on causes of forest fires, their locations and the number of forest fires in particular months of the year. All data are transcribed into graphs and tables. This information is essential from a forest-fire precaution and protection point of view.

## Results

According to data from Table 1 and 2 most fires are formed by careless burning of waste and litter away from dumps (wood waste as a product of wood extraction), fire raising in natural areas and burning of grasslands and dry vegetation and most frequent (often) locations of the fires are areas of wood extraction.

According to Fig. 1, the highest number of forest fires occurs in spring months – April and May which is result of burning of wooden biomass left after wood extraction.

Causes of fires	Number of fires		
	2007	2008	2009
Children (6-15 years old)	2	1	2
Electric cut off	1	1	1
smoking	6	2	4
adult negligence and carelessness	3	1	2
Manipulation with open fire	1	1	-
Operational-technical failures	2	-	1
Unknown (undetected) causes	15	13	27
Failure of exhaust pipe or braking system	-	1	1
Burning of waste and litter (away from dump)	17	20	49
Wilful inflammation by unknown person	6	4	11
Burning of grasslands and dry vegetation	18	10	10
Fire raising in dumps	2	-	5
Fire raising in nature	39	21	28
Spontaneous re-burning of fire	8	-	9
Sum	120	75	150

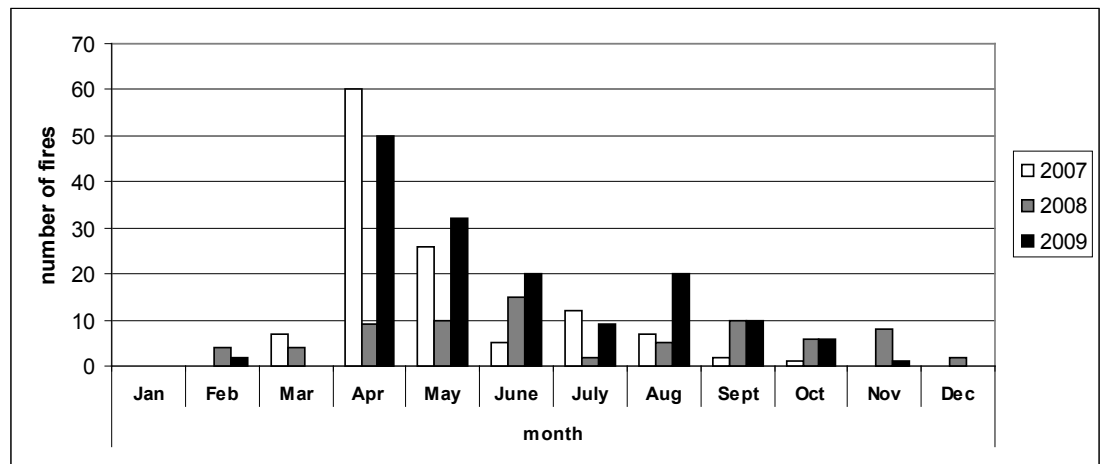
**Table 1.** Causes of forest fires in the Žilina region in 2007-2009.

Location of fire formations	Number of fires		
	2007	2008	2009
Locations of wood extraction	30	40	82
Coniferous forest (< 10 years old)	15	6	8
Coniferous forest (> 10 years old)	40	16	15
Mixed forest	23	12	36
Deciduous forest	1	-	2
Other forests	8	-	7
Dwarf pine vegetation	1	-	-
Forest tree nursery	2	-	-
Sum	120	75	150

**Table 2.** Locations of forest fire formation in the Žilina region in 2007-2009.

## Discussion

Burning of wooden biomass left after wood extraction is among the most common causes of forest fires. It is caused by negligence in the process of fire elimination. Precautionary measures kept in the wood burning process must be defined, especially control of the site of the fire and putting out the fire after the liquidation of wooden biomass. According to the valid Slovak legislation there has to be control of the site of the fire after 4 hours to prevent re-burning and another control between 12 and 24 hours. It is only allowed to carry out the burning process before noon. The site of the fire has to be free of flammable materials and secured against spread of the fire. Very important factors are meteorological conditions. For this purpose a map of



**Fig 1.** Number of forest fires per months in the Žilina region in 2007-2009.

fire threats was established on the website of the Slovak Hydrometeorological Institute (SHMU) showing which areas can generate fire risks in a chosen location. Sufficiency of extinguishing agents and appropriate tools has to be managed. It is necessary to inform the relevant district head-office of the Fire and Rescue Brigade of the dates of every burning of wooden biomass.

## References

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