



Albania

Update on the Forest Fire Situation

Introduction

This paper is an extract of a comprehensive study "Economic Analysis for alternative Scenarios of a Forest Fire Management Programme" conducted by the Directorate of Forest Police, Directorate General for Forest Protection, Albania, in October 2002. Some remarks have been extracted from the report "Development of a National Forest Fire Management Strategy and Action Plan for Albania", November 2001.

1. Background: Albania's Forest Sector

Albania, despite its very small territory (28,750 km²), is one of the European countries with rich vegetation, which originated during the Tertiary era. Today's vegetation of Albania is composed of endemic relic vegetation and of species that have invaded from neighbouring regions through migration, having phylogenetic similarities with floristic elements of neighbouring countries. Albania is a mountainous country with higher topographic and climatic variety than the other European countries: 52% of its surface is on elevation between 600 and 700 m a.s.l. with prevailing steep slopes (ca.30%). Thus, ca. 90% of its surface is subject to severe erosion. The northern, north-eastern, south-eastern and central areas are characterized by hilly-mountainous terrain; whereas the north-southern/coastal area along the Adriatic and Ionian coast is lowland.

Climate extremes range from extreme cold winters in the northern, northeastern and southeastern areas to very hot and dry summer along the coast. Rainfall regimes vary from north to south and from Coast to Inland. There are fewer rainy days in the south than in the north, but months without rainfall can occur at any time of the year, as it is typical for the Mediterranean climate. Local precipitation differences lead to diverse vegetation patterns. Forests occupy 1.025 million ha standing volume of about 82 million m³ and an average annual growth of 1.4 m³ per ha (this is very low compared with many countries of central Europe). The management regime of the forest areas is as follows:

- round 460,950 ha are high forest (46% of the total forest areas) consisting in 171,850 ha conifers and 289,370 ha broadleaves
- 332,250 ha are coppice (29% mainly oaks)
- 257,850 ha are shrubs (25%)

Taking into account the functions of the forest areas, 193,000 ha perform protective function while the rest (836,650 ha) are productive forests. The forest species composition is as follows: 160,000 ha of beech (*Fagus sylvatica*), 142,000 ha of pine (*Pinus* spp.) and the rest is broadleaves 310,000 ha (34%).

The main task of the Forest Administration Headquarters is to provide timely elaboration and realization of the fire fighting plan and put this plan into effect and organization of fire extinguishing wherever it occurs during the season of forest fires.

2. Present Status of the Forest Fire Situation

2.1 Regulatory Framework for Forest Fire Management

The obligations and relevant institutional responsibilities for protection of forest against fires are regulated by some legislative acts. According to this legal framework, all forest & pasture managing organizations and the owners of the private forests and pastures areas are obliged to take the necessary measures for protecting those forest areas under their jurisdiction. There are two laws and a set of special regulations/guidelines:

- Law on Forests and Forest Service Police Nr. 7623 dated 13 October 1992
- Law on “Protection against fire and Rescue”, Nr. 8766, dated 5 April 2001
- Regulation/Guideline Nr. 25 dated 8 February 1993 “On forest protection against fires & pest and diseases and financial means”
- Act of Council of Ministers / Nr. 288 date 27 June 2002 on “Determination and taking measures against fire and rescue for the objects of special importance” (which includes watersheds, national parks etc);
- Guideline Nr. 1 dated 30 July 2002 on “Determining and taking measures against fire and rescue in the objects of economic and state importance” in virtue of implementing the Act. Nr.288 date 27.06.2002.

This legal basis underlines the institutional compulsory responsibilities to be taken for forest protection against fires as well as taking of preventive and repressive measures associated with relevant annual funds. These laws prohibit lightning of fire in the woods and prescribe formation of fire prevention barriers and biological/silvicultural measures, erection of observation posts, its strengthened seasonal network and the organization of patrol service.

2.2 Forest Fire Statistics and Dynamics

Forest Fires Statistics are collected by the Forest districts and evaluated by the General Forest Directorate. Most of the forest fires in Albania occur at the end of spring and in summer (Figure 1). The main causes of fires are human negligence, and to a lesser extent due to arson or caused by lightning. Fire data for the period 1981-2001 are given in Figure 1 and indicate that fires are mostly occurred during three months (July, August and September). The worst years were 1997 and 2000. Figure 2 indicates the standard deviation of the forest fire occurrences by district for the last six years. As can be seen, the fire phenomena is characterised by an exponential tendency (burned areas) and not a linear increase as can be expected or think preliminary, which in other terms means a critic situation for a near future and suggest to take a high alert about this problem.

The ongoing of forest fires in Albania as is presented also by the graphic is in a continuous increase during over the last 20 years. An important index to evaluate the nature of distribution of forest fires is the standard deviation of occurrence, given to the following figures related to all the districts in Albania.

The forest fires occurrence in Albania during the last 20 years is characterized by an increase, as for the number of cases observed as well as for the surface affected, arriving on the last three years values which are over the average of the other Mediterranean countries. This means that if no immediate measure will be undertaken to protect the forest from fires, on a near future it might be expected a higher degree of damage in our natural resource – forest base.

To complete the judgment about the forest fires, in the above mentioned figure is presented also the rate in percentage between the burned areas and affected zones by districts, which in national level is about 22%.

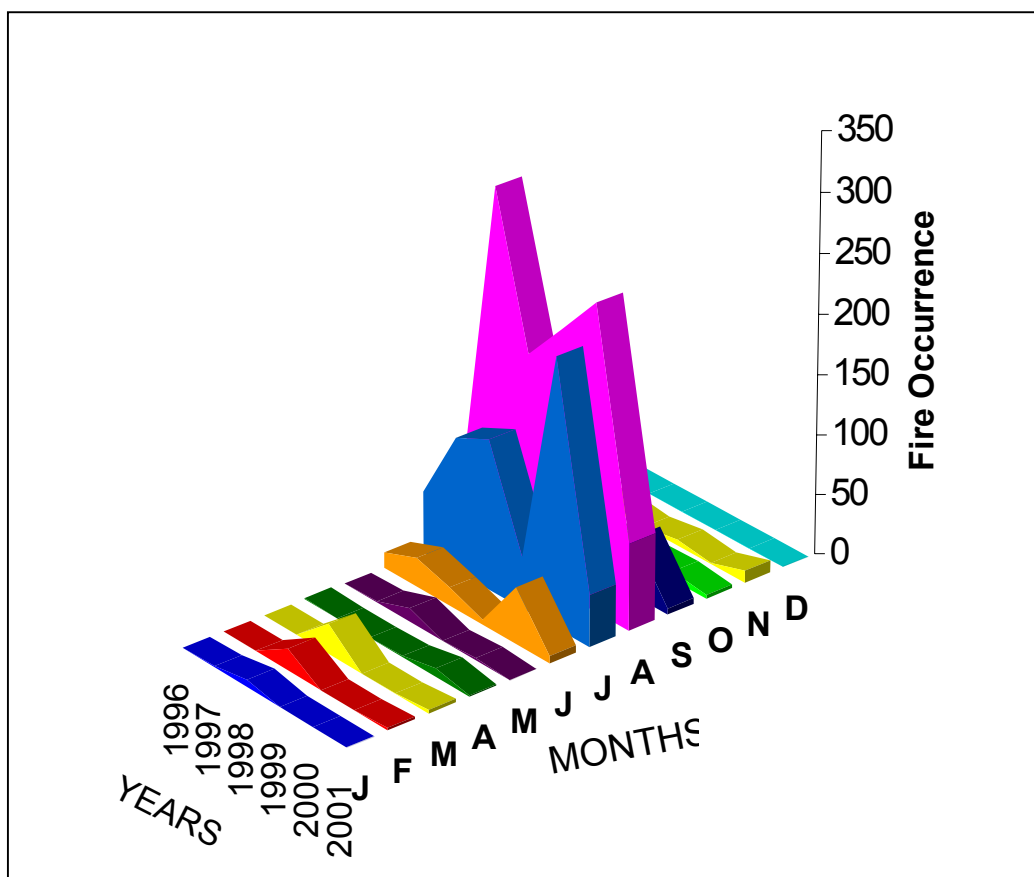


Figure 1. Intra-annual distribution of wildfires (number of fires) in Albania during the period 1996-2001.

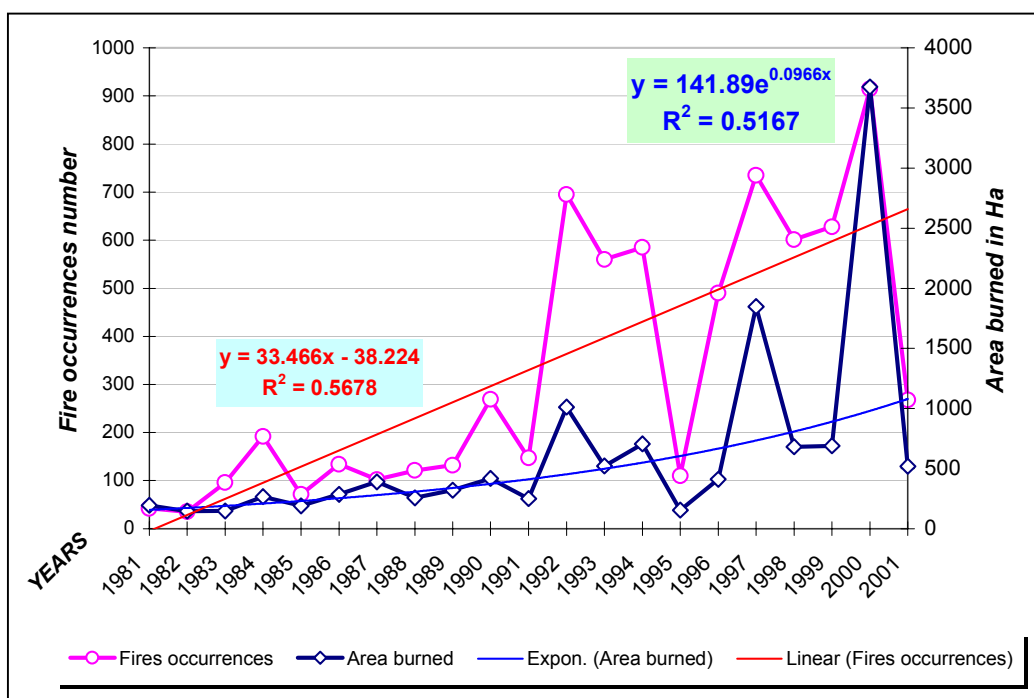


Figure 2. Forest fire statistics of Albania for the period 1981-2001.

2.3 Causes of Forest Fires in Albania

Examining the reasons of forest fires, it is revealed that 29 % of forest fires arise from carelessness and negligence, 61% from unknown reasons, 9% from intentionally reasons and only 1% from unusual events and from lightning. However, it should be understood that even forest fires marked as “caused by unknown reasons” are considered as started by people. As these fires are not known exactly why they were started by and therefore, they are called as “unknown reasons”. In this case, it can be concluded that people cause a great portion of the forest fires occurred in Albania. These values don't differ so much from the other data of Mediterranean countries. Figure 3 shows the causes of forest fires by individual years between 1996 and 2001. Figure 4 shows the damages according to causes of fires.

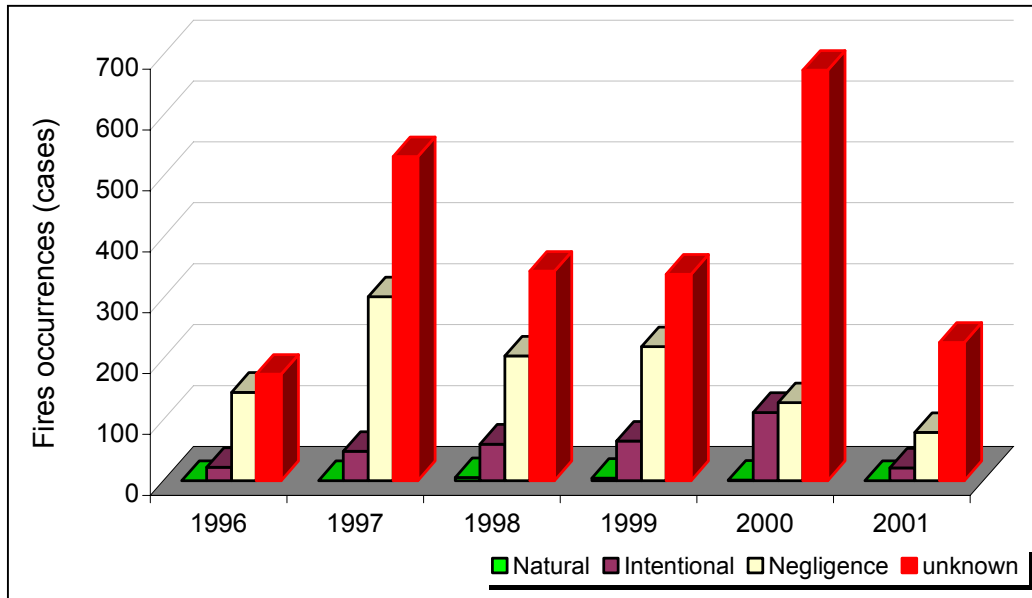


Figure 3. Repartition of forest fires according fire causes in Albania for the period 1996-2001

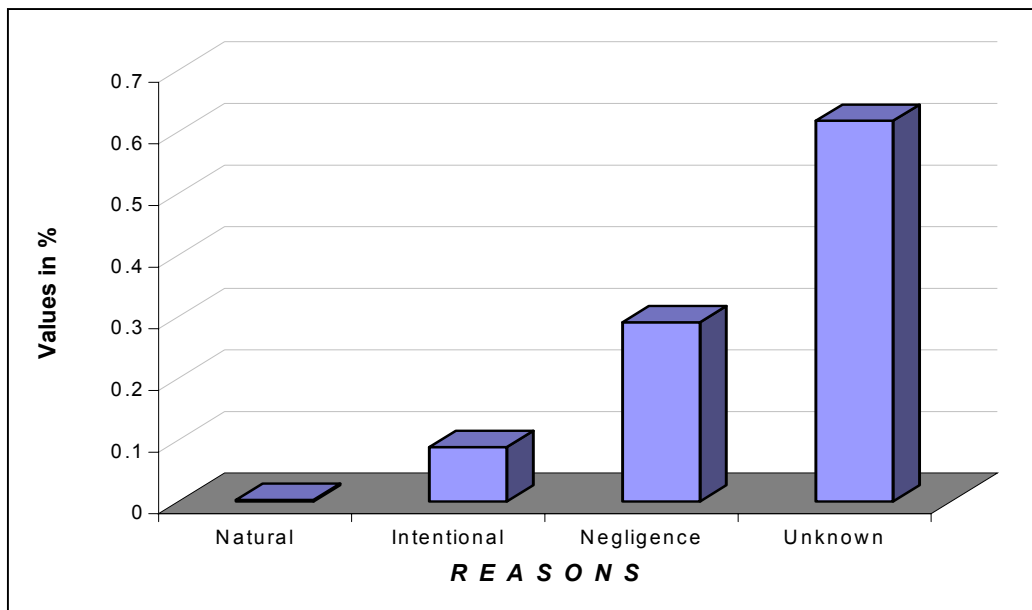


Figure 4. Value of damages according to causes of fires

Among the forest fires caused by negligence and carelessness, the most important ones are the fires arisen from cropland burning and clearing fields for agricultural purpose, cigarette, picnic fire, other fires set by shepherds and hunters. Among the fires occurring accidentally, the fires arisen from breaking off the electricity line are also important. Clear cutting for agricultural purposes and covering the tracks of criminal are intentional fires started by people. In Albania, people are a main factor causing the forest fires. In this case, it is important that human being must be taken into consideration for the protection of forests from fires.

Besides the requirements for forestry related training of a part of society, it is necessary to expose the economic aspect of damage resulted from forest fires and therefore having a more clear picture on the financial values of damages created by fires and hopefully making aware the respective authorities for the need to get immediate and appropriate measures.

Climate conditions and the ongoing of specific meteorological elements, which facilitate the starting process and consequently also an easy distribution of fires in other spaces, are also of primary importance. The majority of forest fires occur during June – September reaching the maximum during July and August (in this period the soil surface maximum temperatures is round 65°C-70°C).

2.4 Albania versus other Mediterranean countries

Let see for a while how Albania is positioned versus what is happening in other Mediterranean countries. Generally, all Mediterranean basin is frequently affected by the forest fires. An index is developed by the team to compare the situation of forest fires among a group of countries with similar agro-pedo-climate conditions. This index is based on the ration between the forest areas burned in a country and total surface of that country for a give period (1989-1998). This index for Albania has almost the same value as in other countries.

It's very important to underline that during the last time (period 1998-2001) the value of index **G** for Albania in the following table is higher than that of the other countries, which means a significant increase in loss and total damage in our forest areas.

Table 1. Comparison of forest fires occurred in some European Countries with regard to “area of forest burned by a fire” (average of the period 1989-1998).

A	B Country	C Surface of the country (km ²)	D Number of annual average fire	E Annual average forest area burned by fire (ha)	F Average forest area burned by a fire (ha)	G Rate between (E) and (C)
Period 1989-1998	Turkey	780 000	1 943	13 635	7.02	1.75
	France	549 000	5 269	27 336	5.19	4.98
	Italy	301 000	11 499	106 664	9.28	3.54
	Spain	505 000	16 995	191 004	11.24	3.78
	Portugal	92 000	18 595	92 608	4.98	0.01
	Greece	132 000	1 817	49 276	27.12	3.73
	Albania	28 750	432	632		2.19
	Average				10.81	2.85
1989-2001	Albania	28 750	471	861		3.00
1998-2001	Albania	28 750	604	1 627	7.4*	5.66

* (calculated for the year 2001)

The occurrence of forest fires in Albania distributed by districts for the years 1999-2001 is provided in Figure 5

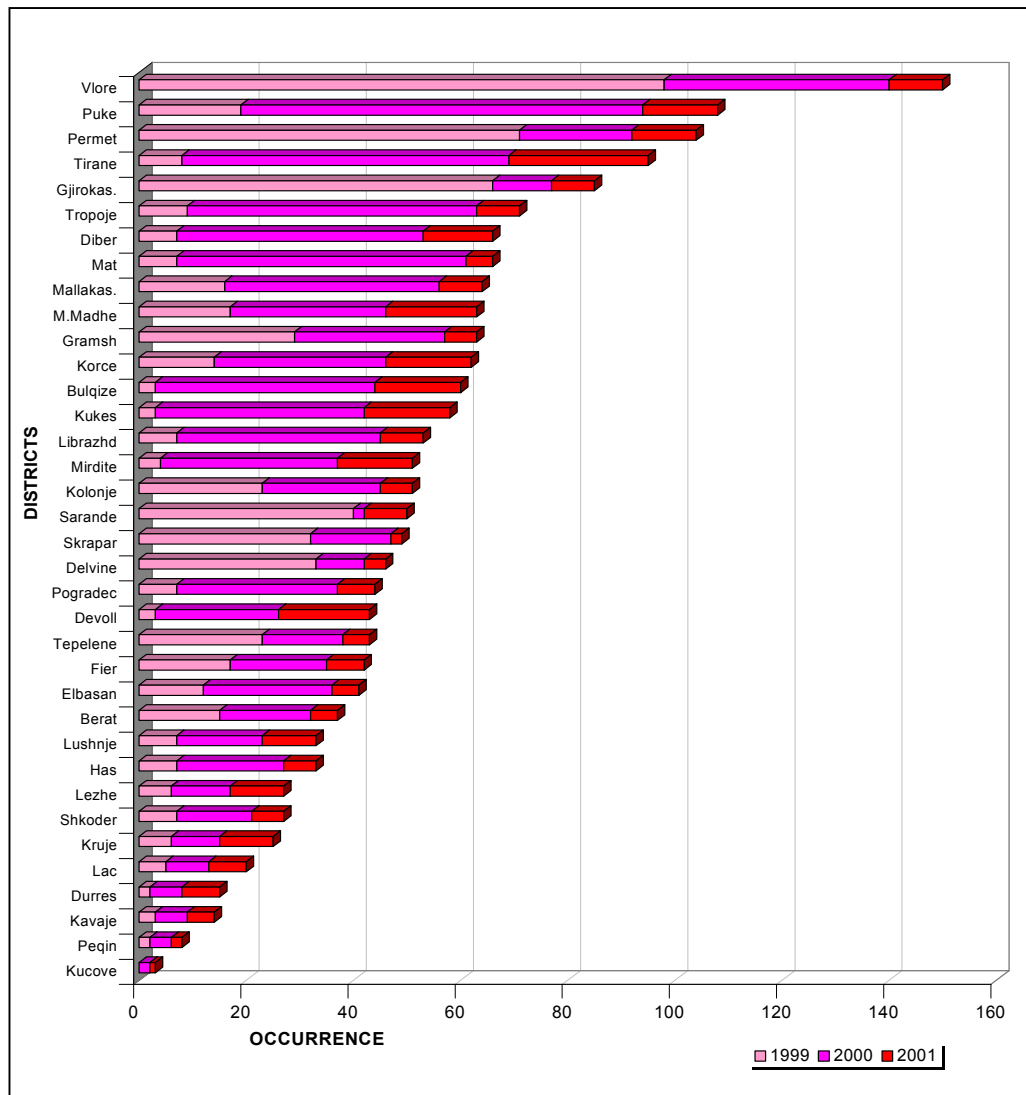


Figure 5. Occurrence of forest fires in Albania by districts for the years 1999-2001.

2.5 Forest Fire Prevention and Control

The fundamental goal of the contemporary forest management is that the goods, services and benefits of forests are provided according to the principles of sustainability and multiple uses for the usage of society. Achieving this goal, implies that the forest resources take part in the focal point of sustainable development when considering its prevalence, share weight in the biomass, organization level, vital role in the energy and matter circulation, the size of targeted population group directly benefited from forests. In another word, the route of the sustainable development passes through the sustainable forestry (GERAY 1998).

However, there are some biotic and abiotic factors affecting the sustainable forestry, which is extremely important for the sustainable development. While some of these factors are originating from human being, some of them are arisen from the processes of fungus and insect damage, storm, snow, fires, etc.

Human misuse of fire (accompanied with deforestation during the past years) and over-grazing practices were no doubt largely reasons for most of the forest destruction. Unfortunately unrestricted grazing and uncontrolled fires -caused accidentally and often due to agricultural burnings-, still occur throughout Albania.

A well-organized fire prevention program is still absent in Albania. A permanent observation-signalisation system/net (with several fire towers per district) is available in fire-endangered forests of the whole country and operated by the Forest Service during the fire season. The existing fire suppression infrastructure and equipment still needs to be upgraded while the professional skills of the forest staff in forest fire suppression and suspension should be upgraded and strengthened. To further improve the monitoring system during the fires season it's of primary importance to set up an appropriate specific meteorological and environmental network of measurements - dispersed inside and near the forest areas.

Forest fires are the most important one of destruction factors causing the big losses of benefits for the national economy by destroying the forest resources base. More than 50 % of Albanian forests have sensitive characteristics with regard to forest fire. The forest fires are considered to be among the main persistent factors to the destruction of forests in Albania.

2.6 Exposure to Risk

Albanian is generally highly disposed to the forest fire risk. The scientific community has identified and analysed various factors that influence in the level of exposure of a given area to the forest fire risk. They have developed a formula where all these factors are taken into account to determine the exposure level of various forest areas. Based to the results derived by the application of this formula $\{GRLI = \log(Nf \cdot Sb / Sa \cdot Sb \cdot CvSb)\}$ where:

GRLI - general risk logarithmic index (multifunctional assessment about the damage expected by forest fires)

Nf - number of fires - occurrence by districts

Sb - burned surface by districts

Sa - affected areas by districts

CvSb - Coefficient of variation of the series of burned surfaces by districts

it is be possible to determine the distribution of forest wildfire risk exposure by districts. Based on a logarithmic calculation of quartiles, the derived results are visualized in Figure 6.

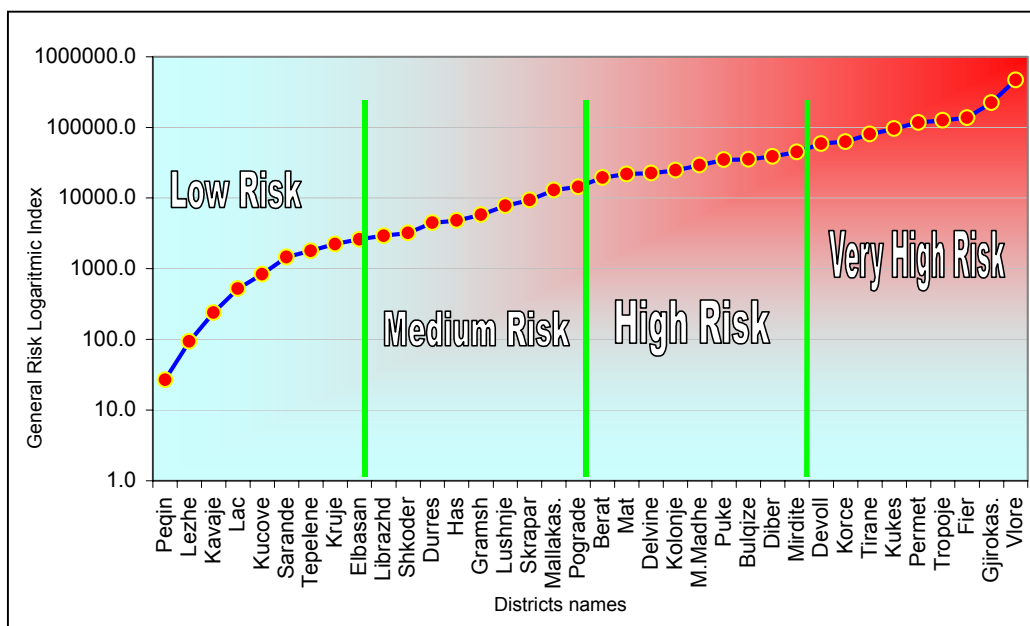


Figure 6. Zoning of forest areas based on fire threat and exposure

In addition, it comes out that the coefficient of correlation between the series of above-mentioned formula results and the total forest areas by districts, has a non significant value 0.15 and a coefficient of determination only 0.02. These two indicators are supporting the idea that the total forest surface of districts does not have any kind of significant influence to the risk level (as can be thought). So, it confirms again that the reasons are related to other factors, as has been mentioned before and related to the human activities, meteorological conditions, vegetative situation of trees, etc.

2.7 Typology of Areas Affected by Fires

At the following graph is presented in percentage the situation in different places (different vegetation cover) where is observed the fire, between the burned and affected cases - occurrence; and the burned and affected surfaces. There is clearly evidenced that generally for fires in pasture areas, about 85% of observed cases are accompanied by burned situations. Regarding the surface in 66% of them is verified the burned situation, which are the highest value related to the other forest environments (composition).

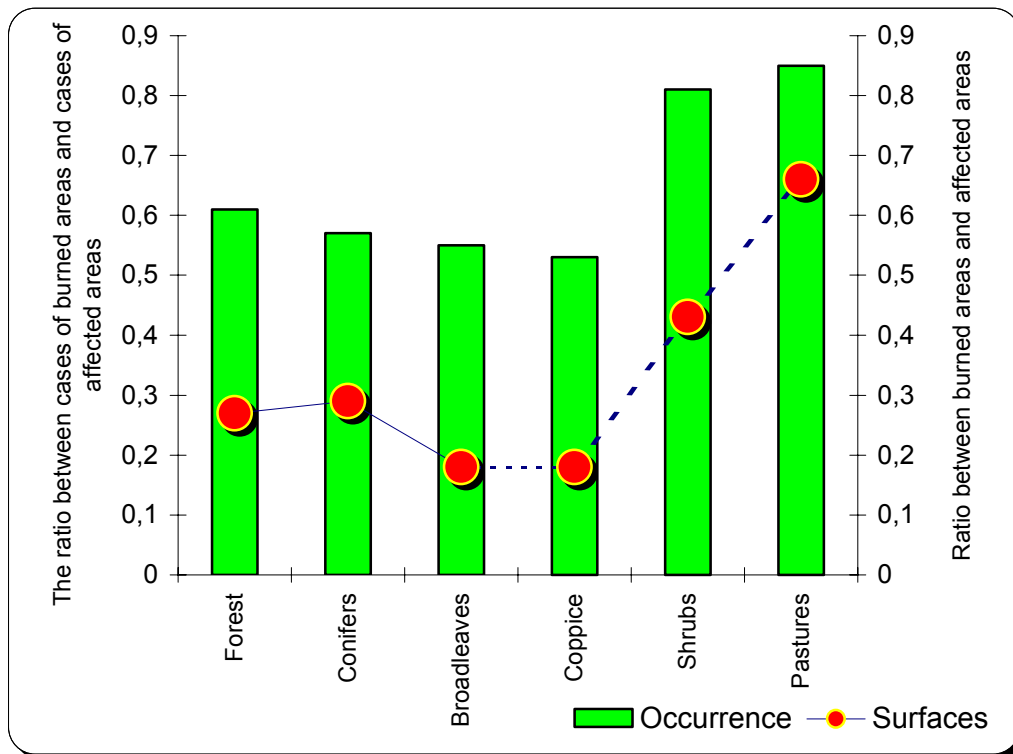


Figure 9. Relation burned areas and affected areas

The situation is rather different in case of fires in forest areas. In forest cases affected by fires only 60% of them is accompanied by burned situation; and if the burn process starts normally only in 27% of the surfaces (in average) will be classified at the end as burned areas. This is related generally with the intervention of forest fighters and people, which reserve a major interest about the forest regarding to the pasture areas, but may be related also to the enormous surface of pastures or the accuracy of data, etc.

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