

Integral Plan for the Prevention of Forest Fires in Spain in the Case of the Community of Valencia¹

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Abstract

The integral plan for forest fire prevention takes into account every aspect of the behaviour of the forest ecosystem in a forest fire, proposing adequate preventive measures for fuel management, considering the most important changes of forest use in recent decades so that fuel accumulation constitutes one of the main risk factors in the outbreak of large-scale fires. But also it includes the creation and maintenance of a road network and water supply infrastructure leading to rapid, safe and efficient fire extinction.

However, in order to ensure that the above infrastructures function successfully within the concept of sustainable forest management, direct action on each and every cause of forest fires is proposed. Therefore, in addition to acquiring detailed knowledge of each of those causes, conflicts are analysed and conciliation systems established alongside a system of active dynamic vigilance with a presence throughout the territory, able adapt to changing hazard conditions.

Introduction

The gradual reduction of the number and the extent of forest fires is a basic aim of the Conselleria de Territori y Vivienda del Gobierno Valenciano, (regional planning department) and one which, despite its achievements so far, is not an easy task and which is, of necessity, an ongoing endeavour, incorporating new measures, resources, technologies, and moreover, constantly dependant on the maximum cooperation of public sectors.

Prevention is the key in the battle against forest fires. Data shows time and again the obvious correlation between the number of fires over the years and the surface area affected, thus any action towards reducing the number of fires is fundamental in an overall fire-fighting strategy.

A reduction in the number of fires is therefore essential in the search for a definitive solution to the problem, and the *Generalitat Valenciana* (the Valencia Government) has in recent years dedicated a considerable part of its budget to achieving this end, in educational and awareness programmes, the conciliation of interests with those who make use of the woods and surrounding areas, research into the causes of forest fires, forestry and environmental volunteers, and preventive vigilance.

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Programmes implemented both through direct investment and grants, with the latter being an increasingly used measure, there are help lines in progress for assistance with voluntary environmental activities, dissemination of forest fire prevention measures in the agricultural sector, the promotion of controlled grazing biomass control and elimination of agricultural waste without the use of fire (pilot scheme).

However the prevention of forest fires does not end once the aim of reducing the number of fires has been achieved, the second objective is to reduce the area affected by fire.

Actions to reduce the number of fires are complemented by others, no less important, which facilitate rapid fire detection followed by swift, efficient and safe extinction of the fire through, for example, the implementation of a network of forest firebreak zones, the extensive reintroduction of livestock in forest areas as a natural undergrowth eliminator, the expansion and improvement of the Forest Security Plan, both in terms of forest look-out points and the mobile security with the incorporation of more modernised vigilance units

All this is the key to the success of the forest fire prevention policy currently being implemented by the Valencia Government.

Knowledge of the causes

Knowledge of the causes and motives for forest fires is fundamental when designing various prevention policies, and essential to this is the work carried out by the Research Operation Group for the Causes of Forest fires.

This team, which has been in operation since 1995, is a key player in prevention strategy, and in recent years its work has discovered over 90% known causes of fires in the state sector over the years.

Conciliation of interests

The concept of the conciliation of interests is complex and includes various activities such as the ordering of recreational use, promotion of alternatives systems, to use of fire in agricultural procedures, promotion of controlled grazing, as a tool of biomass control etc.

The aim is not so much to act directly on the direct cause of the forest fire but rather on the problematic structure which determines the creation of hazardous situations or negligent attitudes which could give rise to a forest fire.

The promotion of biomass control by means of controlled grazing, for example, has been one of the most successful projects which, in addition, re-establishes a traditional practice beneficial to fire prevention.

This technique of extensive controlled grazing is carried out with the cooperation of farmers and the Valencia government, which provides the extra costs this activity generates.

Controlled grazing is implemented on the basis of a plan of exploitation, involving the number of livestock owned and the area of hectares available. The plan

establishes both the number of hectares to be grazed daily, based on the numbers of livestock owned, and the number of hectares of grazing over a specific period.

The plan establishes rotational grazing with periodic appraisals to determine the response of the vegetation and to check that rational use is being made of resources so that the environmental benefits are optimised to the highest degree.

At the same time measures are being taken to provide the forested areas with an agricultural support infrastructure with the construction of sheep folds and drinking troughs for livestock.

Also important in respect of conciliation of interests, is making the elimination of agricultural waste and forest fire prevention compatible, and to this end projects such as the Local Burning Plans in the municipal sector or subsidising of agricultural waste burners have been put into practice.

However, there is a clear desire to promote new technologies for the disposal of agricultural waste which would obviate the need for burning, and pilot schemes for the disposal of agricultural and vegetable waste without the use of fire should be mentioned.

Vigilance

A continuous growth plan

The Vigilance Plan is a prime objective in the Valencia Government's forest fire prevention policy, and there has been a constant rise in financial, material, human and technological resources with a budget of 10,154,677.99 € allocated in 2003.

A dynamic plan

Several collectives and administrative departments carry out the functions of patrolling and controlling the woods and forests of the Community of Valencia (*Table 1*), and it is therefore important that they act in a coordinated way. The Vigilance Plan therefore, is not simply the sum of its parts but effectively a strategy which defines the guidelines and criteria for implementing those means in an effective and dynamic manner.

The plan is designed to adapt to hazardous conditions; in order to plan the activities of the prevention units, studies determine in each local area and operative zone, the period and moments of greatest risk, thus enabling service to be available to coincide with these conflictive periods. In order for this response to be effective the plan needs to operate 365 days a year. This objective is achieved through a progressive system of incorporation which ensures the presence of vigilance services all year round.



Figure 1— Mounted and land vehicle fire prevention unit

Table 1— Among the various prevention units included in the Vigilance Plan those managed by the Town and Country Planning Dept. are particularly noteworthy

Units	Alicante	Castellón	Valencia	Region	Total
Ordinary prevention units	18	20	34	-	72
Horseback units (fig. 1)	1	3	1	-	5
Motorbike prevention units	3	3	5	-	11
Multi-purpose prevention units	4	4	6	-	14
Helicopter transport units	-	-	-	1	1
Technical unit	-	-	-	1	1
Forest lookout points	13	25	33	-	71
Environmental agents	53	65	109	-	227
Cause investigation group	3	2	3	1	9
Technical personnel units	13	11	16	3	43
Communications Centre	1	1	1	-	3
Total	109	134	208	6	457

This, together with participants in the voluntary environmental and forestry programmes, and the resources provided by the regional Justice and Administration Department, local government bodies, Local Police, Ministry of Environment and the Forces of State Security amounting to the participation of more than 5,000 people in 2003.

Forest look-out posts

Another basic element in the setup is the network of forest look-out posts, since in addition to the vigilance work they carry out, they are also important for the coordination of both the Community of Valencia's Vigilance Plan for the Prevention of Forest Fires and for forest management.

The maintenance and improvement of this network is a permanent goal, and various work projects are being undertaken which will result in more efficient services and improvements in safe working conditions for all personnel. Within this framework of improvements in the efficient service of the forest look-out points since 2002, a remote controlled camera system has been introduced in the area of the forest look-out point of Font Roja.

Similarly, the network is currently being extended, with 4 new look-out points which will benefit from the latest architectural techniques as part of a pilot scheme.

Volunteer force

The volunteer force is a force for public change characterised by its disinterested, supportive in nature and participation; it does not in any way substitute or relieve anyone of their responsibilities but is nevertheless a process which affects the conception, attitudes and values both of the person who carries out voluntary work and the society to which that person belongs.

Of all the fields in which voluntary action can be developed, defence of the environment and specifically the prevention of forest fires is one of the most important and one of those in which the Valencia public have shown considerable interest, and as a result, the Valencia Government has assumed the task of promoting and acknowledging this by means of aid and through direct action.

Improvement of infrastructures

Correct forest management requires an adequate infrastructure with a network of units, some of which attempt to prevent fire spreading and such as firebreak areas or water tanks, and others in addition to being useful and fundamental to halting the spread of fire are also extremely useful for vigilance and management of forest systems such as roads and look-out points.

The forest road network

Of all these measures the improvement and maintenance of the forest road network is extremely important, since it ensures correct management of the forest terrain, both in terms of improvement of forest quality, vigilance and when the need arises,

providing immediate and safe access for fire-fighting teams in the event of forest fires.

To this end a series of continuous investments are being made in an effort to improve this road network with a series of projects designed ultimately to create a hierarchical network which, irrespective of meteorological conditions, will always be roadworthy for the modes of transport of the management, vigilance and extinction departments.

Water tanks

The water supply network has been designed with a practical approach, the purpose of which is to provide the forest areas with an open deposit for every 2,000 hectares, with a minimum capacity of 200.000 litres (*fig 2*), thus ensuring a rate of 5 to 6 minutes between loads for fire extinction helicopters.



Figure 2—Example of a water deposit for fire extinguishing services

In recent years the number of facilities has considerably improved, thus fulfilling one of the prevention policy goals, namely to reduce the number of fires and to ensure that when fires break out, the infrastructure permits rapid, safe and efficient implementation of fire-fighting methods, and an important aid in achieving this end is the integration of all the information available in the Integrated Management System

Firebreak areas

The present situation of forest fuel, social and economic changes which have taken place in recent decades (abandonment of traditional agricultural foresting practices,

such as timber use; end of agricultural activities, reduction of grazing) together with the natural vegetation system of the Mediterranean area, have led to a situation in which the risk of a “catastrophic” forest fire is real one.

It is therefore necessary to propose policies for fuel management of forest land, which would be considered useful not so much in an ordinary fire but in the Great Fires which tend to recur in Mediterranean areas.

The previous proposals, in conjunction with the reality of forest fires which have occurred during the last decade in the Community Valencia, have been instrumental in the Valencia Government’s assumption that essential to its policy of forest fire prevention and extinction, is the development and implementation of a Preventive Forestry Plan drafted with strict adherence to technical guidelines and in line with the international scientific community which supports fuel management as a basic strategy in the campaign against forest fires.

The plan has been devised to include the total forested area of the Valencia Community, irrespective of whether the property is public or privately owned. In order to ensure that the plan is also executed on private land a process is underway to declare Urgent Action Zones, by means of Regional Government Decree.

Another fundamental characteristic of the Plan is its commitment over time which requires the maintenance of 2 to 4 year periods. This maintenance is currently in progress in the initial areas where the plan has already been implemented, and for which, apart from the traditional systems, other compatible methods are being developed such as biomass management using controlled grazing and truffle cultivation forestry.

As mentioned, the Plan has been designed to cover the total forested territory of the Valencia Community, for which it has 68 areas of activity which form part of the corresponding work projects, which include activity both in public and private forest land, and therefore, prior to carrying out projects in privately owned woodlands, a declaration of Urgent Action Zone is implemented in every area.

New management systems

To date, various forest fire prevention schemes have been developed, the creation of which required the response to a series of basic questions such as Where can a fire occur? How can it occur? When can it happen? The reply to these questions is obtained from knowledge of situations of risk in time and in space.

Knowledge of such situations permits “mobilisation” of prevention resources which are able to prevent the outbreak of fire, or, if this is impossible, at least the effects may be minimised.

Nevertheless, it should be borne in mind that given the nature of a region as varied as Community of Valencia in which risk factors are changeable and in many cases due to a complex interrelation of multiple factors. It is therefore necessary for those in management when making decisions to have at their disposal support tools which should be reliable and appropriate to the social and climatic characteristics and to the physical terrain to which they will be applied.

The Integrated Management System (IGS), implemented at the end of 2002 con as an experiment is a dynamic tool which though based on a Geographical

Information system is much broader in scope as it can process and generate varied information, since it serves and is served by various forest fire prevention programmes already implemented by the Valencia government and which have such positive results in reducing the effects of forest fires in the Valencia Community.

Dissemination of preventive messages

Despite the importance of all the activities described, it is nevertheless necessary to maintain and carry out campaigns disseminating the messages of prevention at all levels of society either through general campaigns such as those using communications media, via radio, television or newspapers. Also, and very importantly, through specific campaigns which focus for example on the agricultural sector and are publicised through agricultural unions and associations or through specific activities such as environmental education.

Implementation

These activities are implemented in two ways, through direct investment and by means of grants either to the proprietors of forestry land both public and private or to specific bodies, the financial breakdown of which is indicated in table 2.

Table 2— *The table shows the various budgets allotted in 2003 to various forest fire prevention programmes carried out in the Community of Valencia*

Programmes	Euro
Information and awareness	167.980,00
Forestry Education and dissemination	Not quantifiable
Conciliation of interests	4.277.386,00
Management	130.230,48
Forest vigilance and volunteer plan	10.154.677,99
Forest fuel management. Preventive forestry	3.636.362,00
Environmental volunteers	778.015,20
Other infrastructures. Material and human resources	4.270.158,00
Total	23.414.809,67