



**MINISTRY OF AGRICULTURE,
NATURAL RESOURCES AND ENVIRONMENT**

FORESTRY DEPARTMENT
www.moa.gov.cy/forest



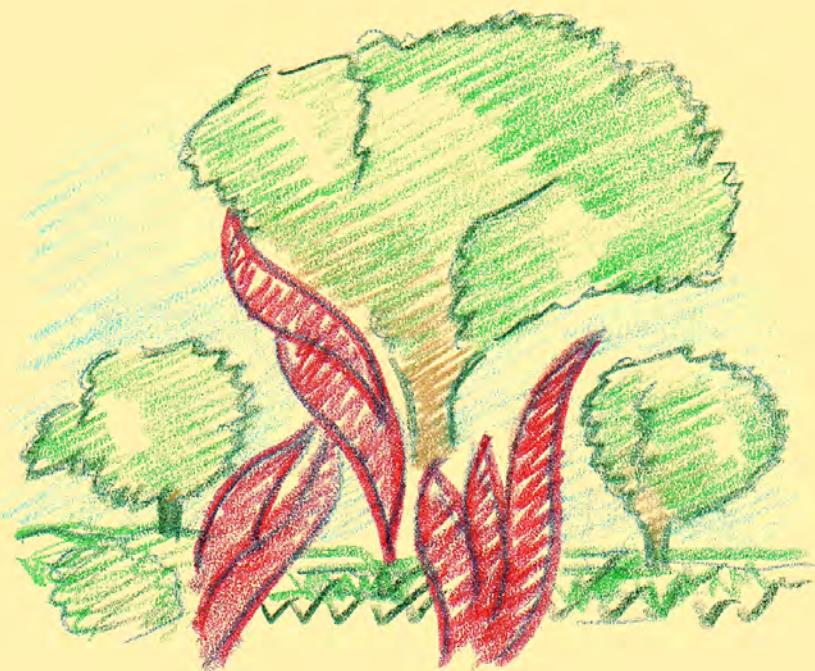
***Forest Fire
Protection
in Cyprus***



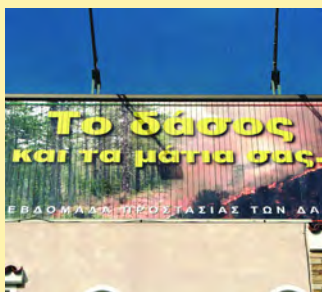
P.I.O. 133/2010—10.000
ISBN 978-9963-38-724-3
Published by the Press and Information Office
Printed by Vasiliou & Sons Ltd



Forest Fire Protection in Cyprus



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General

Cyprus is the third largest island in the Mediterranean with an area of about 925.148 hectares (9.251 km²) and is situated in the north-eastern part of the Mediterranean sea. It is mostly a mountainous country with a typical Mediterranean climate. About 50% of the total area of the island is covered with natural vegetation. The forests are confined to Troodos and Pentadaktylos ranges.

Area and ownership of Cyprus forest

The total area of State forests (high forests) is about 107.043 ha and occupies the 11,57% of the total area of Cyprus. An area of about 139.053 ha or 80,46% of the total State forest area is situated in the area under the control of the government at the free part of the island whilst the rest 19,54% is found in the occupied by the Turkish troops area of Cyprus. According to the last survey, private forests and other forested State land cover 24,74% of the total area of Cyprus. Private forests are small holdings scattered all over Cyprus and are mainly divided from abandoned, mountainous, rural areas.



Climate

Cyprus has a typical intense Mediterranean climate that is characterized by hot, dry summers that last from May until October. Annual rainfall ranges from 250mm in lowlands to more than 1000mm in the highest peaks of Troodos range. The mean maximum monthly temperature fluctuates from 37°- 42° C in areas with an altitude of less than 800m, while in areas with altitude above 1000m temperature is somewhere between 30°-35° C. Relative Humidity ranges from 35-65%.

Floristic composition of Cyprus forests

Nearly half the area of the island is covered by natural vegetation that unfortunately has been degraded by human activities. Forest occupies approximately 20% of this area and is composed mainly of coniferous species like the Calabrian pine (*Pinus brutia*), the black pine (*Pinus nigra*) the Cedar (*Cedrus brevifolia*) and the Cypress (*Cypressus sempervirens*). Maquis vegetation covers 17% with species like Lentisk (*Pistacia lentiscus*), Juniper (*Juniperus phoenicea*), Maple (*Acer obtusifolium*) and Strawberry tree (*Arbutus andrachne*), while 11% is occupied by garigues with typical representatives the Rock rose (*Cistus* spp.), Thyme (*Thymus capitatus*), Thorny-broom (*Calycotome villosa*), Thorny Gorse (*Genista fasselata*) and Spiny burnet (*Sarcopoterium spinosum*). The rest 3% consists of young coniferous plantations.



Administration – Management

State forests are managed by the Forestry Department, of the Ministry of Agriculture, Natural Resources and Environment. For reasons of better administration the forests of Cyprus are divided into three Divisions: The Paphos, the Troodos and the Nicosia-Larnaca and Famagusta Divisions, with headquarters being at Stavros tis psokas, Platania and Athalassa respectively.

The State forests are classified into Permanent forest reserves, National Forest Parks and Nature Reserves. Fellings are confined only into the Permanent Forest Reserves while the National Forest Parks and the Nature Reserves are managed mainly for protection and recreational purposes.

Fire protection, afforestation and reforestation of bare and burnt areas, the improvement of forest productivity and the provision of recreation to the public are among the main objectives of the management of State forests. Private forests on the other hand are neither managed nor properly protected.



Fire protection

Fire danger

Fire is by far the most destructive single agent, threatening the forests of Cyprus and no real progress can be made in Forest Development unless the forests are adequately protected. The long hot and dry summers, the frequent strong winds, the configuration of the ground and the inflammability of the vegetation favour the outbreak and quick spread of fires. Furthermore the urbanization, the abandonment of rural areas and the increased number of visitors in the forest for recreation raise the fire hazard to very high levels.



Causes of forest fires

The biggest percentage of forest fires in Cyprus and especially the most destructive ones are of human origin. Nearly 87% of these fires are due to negligence or lack of care and attention and less than 13% are attributed to incendiarism.

The main causes of forest fires (based on the last years records) are:

- ❑ Burning grass – gorse or stubble by farmers.
- ❑ Fires caused by careless visitors and picnickers when using fire for cooking and grilling.
- ❑ Burning cigarette ends and matches used by careless smokers.
- ❑ Military excersises with ammunition or explossives of any kind.



- ❑ Hunting during the summer period
- ❑ Burning of rubbish at non organized rubbish dumps
- ❑ Fires caused by people or machines engaged in any activity associated with forest engineering and forest production
- ❑ Some fires are caused by lightning but these fires are not significant because these fires are usually accompanied by rainfall.



Categories of fires – Legal responsibility

Fires are, in terms of responsibility, distinguished into three categories:

❑ Forest fires:

Include all fires that occur within the State forests or at a radius of 1Km from their boundaries. The prevention and extinction of such fires is the responsibility of the Forestry Department.

❑ Rural fires:

Include all fires that occur in rural areas at a distance more than 1Km from the forest boundaries. The prevention and control of these fires is the responsibility of the District Administrations according to the Law for the Prevention and Control of fires in Rural areas 1988-1999.



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❑ Fires in inhabited areas:

These are fires happened in inhabited areas or at a distance of 13Km from the nearest Fire Service Station. The prevention and control of these fires is the responsibility of the Police Fire Service.

Prevention of forest fires

The Forestry Department which is responsible for the prevention and control of fires within or near the state forests is fully aware of the high fire danger and takes a series of preventive measures for:

- ❑ the elimination of outbreaks
- ❑ the quick detection
- ❑ the rapid intervention and effective control of forest fires.

The prevention of Forest fires is always preferable to the control. Therefore, the Forestry Department takes many preventive measures in order to reduce the risk of fire outbreaks.



Enforcement of the law

The Cyprus forest law prohibits the lighting of any fire in the forest or within a radius of 1Km from the boundaries of the forests. Also the law is dealing with other matters concerning fire protection very effectively and provides sufficient penalties.

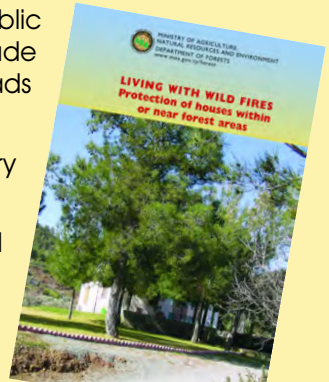
Education and publicity

Since the majority of forest fires in Cyprus are of human origin and especially due to negligence, the Forestry Department makes every effort to gain the support and co-operation of the general public through a well planned and directed publicity and educational programme, including:



- ❑ Talks and interviews of forest officials through the mass media.
- ❑ Special programmes through the radio and television services.
- ❑ Publication of texts and articles in the press and magazines.
- ❑ Lectures and film projection at schools, the Police, army clubs and other organised groups.
- ❑ Production and distribution to the public of relative leaflets and stickers
- ❑ The degree of fire hazard is broadcasted through the radio and the television several times a day and preferably immediately after the news and the weather broadcast. It is also indicated in special sign posts located at the main forest stations and warn the visitors of the forests.

- ❑ Posters and signposts which warn the public about the danger of forest fires are made and placed at conspicuous places of roads and villages.
- ❑ Production and distribution to elementary and secondary schools of special leaflets
- ❑ The "Save our Forest Week" is celebrated every year. A "Save the Forest Day" is also celebrated in all schools in co-operation with the Ministry of Education.



Forest Fire Protection Committee

A protection committee within the Forestry Department is functioning since 1975. Members of this committee are the Divisional Forest Officers, the Principal of the Cyprus Forestry College, the Forest Engineer, the Publicity Officer and the Director by the Department of Forests as chairman. This committee meets twice a year. The first meeting takes place before the beginning of the fire season and decides about the measures to be taken before and during the coming fire season. The second meeting takes place at the end of the fire season and all defaults and drawbacks recorded during the fire season are discussed and correction measures are decided.

Picnic sites

The Forestry Department established and maintains a number of picnic places in the forests to meet the recreational needs of the public. These places in order to be attractive to the public are provided with a number of facilities such as parking places, toilets, water, benches, tables, hearths, sheds games for children, etc.

The picnickers are concentrated in these places instead of allowing them to roam and picnic anywhere without control. In this way the visitors and picnickers are supervised and the danger from this reason is reduced.





Patrolling

During the fire season regular patrolling is done especially along the delimitation line where most of the forest fires start. The main objectives of patrolling are:

- detection, warning and intervention
- public information
- policing, law enforcement and fire suppression.

Most of these patrols are using light brigades and in case of a fire they intervene rapidly and put it out at the early stage.

Each patrol has its own sector and route planned in advance and keep in continuous contact with the central radio – station so that in case of need they could move elsewhere.

Automatic fire detection system

For the quick detection of forest fires, the Department of Forests has been installed in Akamas Forest modern automatic system for the detection of fires (in pilot base), with the financial support of European Union. The system covers the important Area of Akamas and in case of fire the system automatically informs the surveillance centre for the existence of fire and at the same time the starting point of the fire is mapped. This automatic system is operating day and night even under conditions of limited visibility (fog and cloud).

Pre-suppression measures

Infrastructure

Fire breaks

To break up the continuity of the vegetation, fire breaks are constructed. Their width ranges from 6-30m depending on the configuration of the ground and the vegetation. Priority is given to the construction of fire breaks on gentle ridges passable by vehicles and fire brigades.



Forest roads

For efficient forest management in general and for fire protection in particular the Forestry Department maintains a good road network.

These roads are planned in such a way to give access to all parts of the forests for timely intervention when a fire occurs but they serve also as fire brakes.

The forest road density in Cyprus is about 20m per hectare which is considered satisfactory.



Forest telecommunication system

For communication purpose the Forestry Department maintains its own telephone and radiotelephone system since 1920 when the first forest telephone was established. This was in fact the first telephone established in Cyprus.

Today all the existing forest stations, lookout stations and forest villages are linked to this system.

All cars, lorries, fire brigades are equipped with mobile radiotelephones and each forester has his own portable radiotelephone. Within the forest there are emergency telephones at strategic points which are also linked to this system.

Various repeater stations are installed on high mountain peaks through which communication can be directly done from and to any part of the forest.

This system plays an important role in the co-ordination of activities regarding forest fire protection.



Water tanks, hydrants, water valves

Most fire fighting today is done by water.

To secure the necessary amount of water in case of a fire concrete water tanks of about 100m³ capacity are constructed along roads in areas where springs are found to fill or refill the fire brigades.

Hydrants and water valves are installed on pipelines which pass through the forest to supply water in the event of a fire.



Forest fire lookout stations

For the detection and report of forest fires a number of Lookout stations were established. These Lookout stations are located at the top of mountains to ensure maximum coverage of the forest.

All lookout stations are linked to the existing telephone and radiotelephone network of the Forestry Department. During the fire season they are manned on 24 hour basis. The watchers

are experienced persons and they know very well the forest. So in case of a fire they can locate it accurately.

Hidden parts of the forest which are not covered by the existing lookout towers are more frequently patrolled.



Forest stations

These are places where groups of buildings have been constructed to be used by the forest officials and other forest staff either as residents or forest offices. The biggest forest stations are those at Platania (Troodos), Stavros tis Psokas (Paphos) and Athalassa (Nicosia) being at the same time the Headquarters of the respective Forest Divisions. The forest stations are scattered all over the forests and being situated at strategic points so as to command better check on the forests. Any information received for the existence of a smoke or fire is transmitted to the officers of the near by station who will immediately response reducing to the minimum the time needed to reach the scene of fire. Therefore the decentralization of forest stations is essential.

The total number of forest stations in the free parts of Cyprus is 31.



Services for the prevention and extinction of forest fires

Forest fire fighting task force

During fire season 140 persons are recruited to form the fire fighting squads. The Forestry Department has some regular employees trained on fire fighting. These labourers are employed during winter time, on various forestry operations and form the core of fire-fighting squads during the fire season.

The fire-fighting body is split up into groups of 10-15 men and are distributed to various forest stations which are considered as key points for attacking quickly and effectively any fire outbreak.

Each group is provided with one or more cross - country vehicles equipped with mobile radiotelephone, and at least with one fire engine and other necessary equipment for fire fighting.

Though their special task is to fight forest fires, during working days and hours they are not left idle irrespective of the degree of fire hazard. They carry out various forestry works near roads and points where communication, either through telephone or radiotelephone is possible at any time. When a fire breaks out they are the first to go.



Stand-by of forest officials

During fire season all forest staff remain stand by in all forest stations and Divisional headquarters, according to a duty roster, comprising a plan for each forest Division, on a 24hour basis.



In case of fire these foresters are the first to go and organise the labourers, the soldiers and other groups of people to fight the fire.

Cyprus Forestry College

The College with its students proves to be a remarkable fire fighting force. The students of the Forestry College, like the rest of forest staff, remain on call and are ready to go at any place they will be asked to, applying in practice all the theoretical knowledge they gain at the College regarding the various methods of fire extinction.

The College is equipped with cross country vehicles, a fire engine, portable radiotelephones, fire suits and necessary fire fighting equipment.



Organization of forestry works

During summer the forestry works and particularly the felling operations are organized in such a way so as to have labourers and forest officials scattered at various strategic points in the forest. The foresters who are in charge of these operations are continuously in contact



with the Divisional Headquarters and since they are equipped with the necessary tools they can move to the fire without any delay.

Vehicles

The Forestry Department maintains a satisfactory number of vehicles able to transfer the personnel to be employed in fire fighting.

The majority of them are 4wheel drive vehicles which are capable of being driven on off-road conditions.

All cars are equipped with radiotelephones and fire fighting tools.

The Forestry Department is also equipped with tracks used to transport tractors to the scene of fire.



Stores

In all forest stations and villages adjacent to the forest the Forestry Department maintains tool stores and other fire fighting equipment.



Fire engines

The Forestry Department has a significant number of well equipped fire engines which are posted at the various forest stations. Most of them are 4X4 vehicles ready to be driven on off-road conditions in order to be used in fire fighting. The Department is also equipped with a number of small fire engines which are mainly used for patrolling and rapid intervention in case of fire.



Tractors

A number of tractors owned by the Forestry Department are used for road construction, reforestation and other forestry works.

These tractors are distributed within the forests in such a way so as to be used in case of fire. During the summer period these tractors are used exclusively for the construction and maintenance of fire traces.



During weekends and holidays some of them are placed at loading points or are loaded on the trucks ready to be transferred immediately to the scene of fire.

Aerial means

Aerial firefighting of forest fires is applied successfully and effectively the last years in Cyprus. For the suppression of fires the two aeroplanes of the Department of Forests are used. Additionally, every year the Government of Cyprus is renting a number of helicopters which are used for the suppression of forest fires. Moreover helicopters of the Police and the British Bases are used. In case of big forest fire, aerial means from European and other countries contribute to the suppression of the fire.



Co-operation with other Services and the public

The Forestry Department is in close co-operation with other Services like the Fire Brigade, the Police, the Army, the Game Fund and the various Departments of the Ministry of Agriculture, Natural Resources and Environment.

This co-operation includes exchanging of information regarding the existence of smoke or fire and the availability of personnel and other equipment in case of fire. Educational courses are organized by the Forest Department for those services.

For the announcement of fires a special telephone line has been allocated to the Forestry Department by the Cyprus Telecommunication Authority. All calls made through this line are free of charge.



Provisions related to forest protection

Forest Law

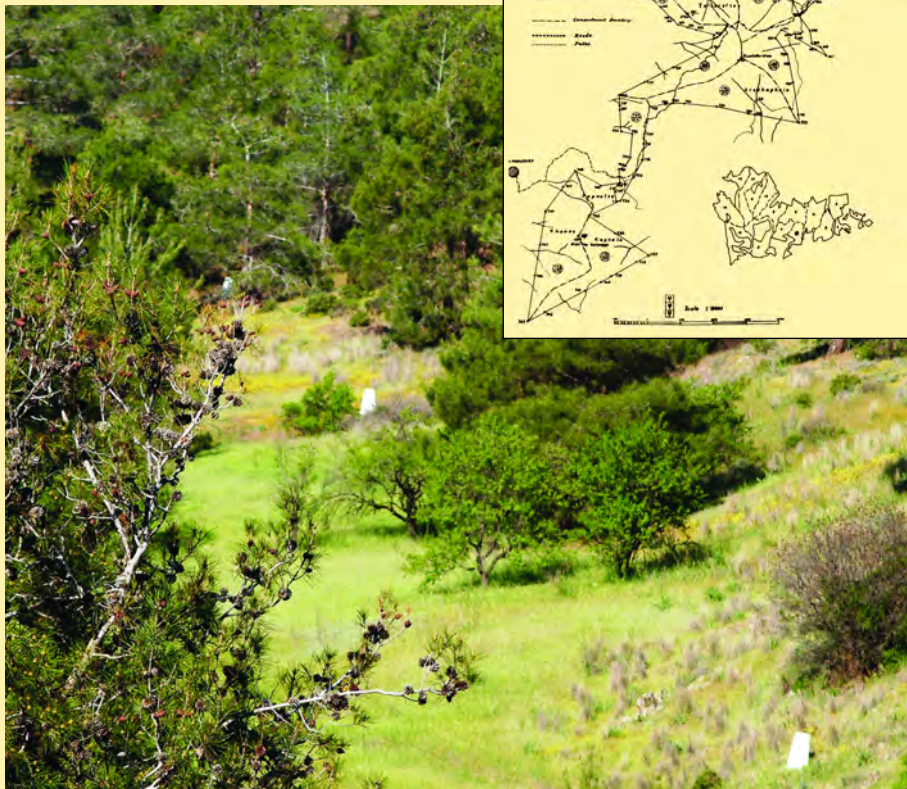
According to the Forest Law any State Land may be declared as State Forest disregarding whether there is any vegetation on it or not. This provision of Forest Law is of paramount importance because it does not allow the change of the ownership of a State Forest even in case the vegetation of a forest area has been burnt after a fire.

Forest delimitation line

All state forests are surveyed and accurately mapped. The boundaries are marked by «forest cairns» (white, concrete pillars of conical shape with a height of 1,5m and base diameter 1,0m). Prior to the declaration of an area into a State Forest, the area is surveyed, mapped and demarcated with well defined forest cairns. Then, it is registered and recorded in the Land and Survey Department registers.



After the declaration of the land into a State Forest nobody is allowed to interfere on it without the prior approval of the Director of the Department of Forests. The legal status of the area cannot be changed unless the council of Ministers decides otherwise.



Grazing in the forest

Grazing in State Forests has been prohibited since 1939. The Forest Law gives the right to forest officials to prosecute illegal shepherds or to impound any stray cattle. If the owner of the stray cattle does not appear within a prescribed period then the cattle is sold in auction.



Delineation of forest boundaries

A lot of private owned plots of land found along the delimitation line are breaking the alignment of forest boundary. A number of such plots are found within the forest as enclaves. The several agricultural activities of the farmers on these plots raise the fire hazard.

It is therefore the policy of the Forestry Department to try and buy or exchange these plots with others of equal value but away from the forest boundary line. This will have as a result the delineation of forest boundaries and unification of State Forests with many advantages towards better and easier management and patrolling, reducing at the same time the fire risk.



Suppression of forest fires

The procedure of fire extinction starts by the time a message for fire, either within or close to the forest, is given.

Smoke detection – evaluation of the situation.

The fire officer is an expert one and knows very well the forest areas. When he receives the message for smoke he orders the patrolling teams to move towards the area of smoke and contacts immediately the responsible officer whose area is threatened. Within a few minutes the information is passed to all patrolling teams and the exact location of the smoke is verified. In the mean time all the fire fighting task forces of other forest stations are set on alert waiting for the final message. If after the localizing of the smoke source it is proved that there is no danger, all forces are dismissed, otherwise the fire fighting plan is set on.



Gathering of fire fighting forces



The message for fire is spread out all over the Division and Headquarters in Nicosia. A coordinator is assigned and departs immediately to the scene of the fire. The coordinator selects a strategic point and proceeds to the evaluation of the various topographic and weather factors and finally distributes the forces at specific positions so as to fight the fire more effectively.

Another coordinator posted at the Headquarters of the Division, in cooperation with the Headquarters of the Department proceeds to the concentration of forces from the near by villages and army camps. The local Fire Brigade Service and the Police are also informed.

New forces will be added to the existing ones or forces already found in the fire will be dismissed according to the progress of the fire and the evaluation of the situation done by the coordinator at the scene of fire.

Tractors are also sent to the area. Seeking of forces other than those of the Department depends on the development of the fire.



Fire fighting

Fire fighting is organized and commanded by the coordinator who is continuously in touch with the higher rank officers that take part in the fire fighting.

The coordinator selects the various channels that communication, through the wireless, will be done to avoid confusion and make sure that all messages will be given clearly and correctly.

The main task is to stop the expanding of the fire and surround the burning area with fire fighting forces.



Guarding (Control) of burnt area – rekindling danger

Once the fire is suppressed, or under control, a sufficient number of fire fighters are spread out surrounding the burning/burnt area with the objective to prohibit any unexpected spreading or rekindling of the fire. In this respect, a fire trace or ditch is constructed around the area and burning spots are totally extinguished.

The guarding of the burnt area may continue for days depending on each case.

Estimation of fire damages

Fire damages are estimated by the Forest Department following certain procedures. All burnt timber found on the area should be removed the soonest possible in order to avoid any infection by insets and fungi.

Investigation of fire causes

The investigation is carried out by the Police in cooperation with the Forestry Department.

Human negligence is the main cause of forest fires.





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