EUFOFINET (European Forest Fire Network)

North Aegean Region: Intervention - Strategies action plan (GP1)

This document constitutes the action plan of the North Aegean Region concerning the good practice provided by partners of the EUFOFINET project on the key theme of wildfire suppression strategies (GP1).

1) The EUFOFINET Project context

The "European Forest Fire Networks" Project (EUFOFINET) is an INTERREG IVC Capitalization Project which is co-financed through the European Regional Development Fund (ERDF). INTERREG IVC brings Regions of Europe to work together and to share experience and "**good practice"** in the areas of innovation, the knowledge economy, and the environment and risk prevention.
A Capitalization Project is an interregional cooperation project which focuses on the transfer of good practices in a specific objective (such as a methodologies, processes, techniques), which were previously developed, identified and successfully tested by the partners and which have the potential to be transferred to another geographic area.
One of the innovative character of this kind of project and of its results is the fact some of the identified good practices, which were developed and worked among different regions and different countries with the contribution of many stakeholders will be transferred through "an action plan" as a suitable policy or strategy related with the management of forest fire risk to the other partners.

The EUFOFINET project focuses on good practice in wildfire prevention, restoration, suppression and intervention.
It has focused on five key themes related to wildfires & forest fires:

- detection and prevention of wildfires;
- wildfire suppression strategies;
- mapping risks and hazards;
- training and simulation strategies
- restoration of land burned by wildfire.

The project duration is 26 months starting from October 2010 until December 2012. The total project budget is 2.084.093 EUR and the fund allocated is 1.655.521 EUR (79%).

The project involves 13 partners from height European countries:
Four Greek partners, who represent regions where wildfires are a major problem, are participating to the project:

- The Regional Union of Attica Municipalities, PEDA, (project leader),
- The North Aegean Region
- The Epirus Region
- The Thessaly Region

The other partners involved are:

- The National Forests Office (Mediterranean Territory) (France).
- The Mediterranean Forest Alliance (France).
- The Tuscany region (Italy)
- The National Forests Centre (Slovakia)
- The Centre for servicing woods and forests of Castilla y Léon (Spain)
- The Galician Academy of Public Security (Spain)
- The Frederikssund-Halsnaes Fire and Rescue Service (Denmark)
- The Forest Research Institute (Poland)
- The Northumberland Fire and Rescue Service (England)

The aim of the project is to facilitate the cooperation among national, regional and local authorities and actors from different countries of the EU through the transfer of their experiences and through the development of action plans in order to improve the efficiency of the policies of regional development.
Some of the duties related to the project are the dissemination and transfer of the results and good practices developed and implemented in the frame of the previous project, integrating them into the regional policies and showing them to other European regions that try to improve their policies.

2) The North Aegean Region involvement to the project EUFOFINET

2.1 Elements for the North Aegean Region

The North Aegean Region is one of the thirteen regions of Greece. It includes the northeastern part of Greece, which is also the southeastern border of European Union. It comprises the islands of the north-eastern Aegean Sea, except for Samothrace, which belongs to the Region of East Macedonia and Thrace, and Imbros and Tenedos which belong to Turkey.
Administratively, the North Aegean region was established in the 1987 administrative reform. With the 2010 Kallikratis plan, its authority was redefined and extended. The capital of the region is situated in Mytilini in the island of Lesbos. Until the reform, the region consisted of the three prefectures of Samos, Chios and Lesbos. Since 2011 it is divided into five regional units, formed around major islands: Chios, Ikaria, Lemnos, Lesbos and Samos. The other populated islands are: Agios Efstratios, Inousses, Psara and Fournous.
The total surface of the Region is about 3.836 sq. km and total population of 204.108 citizens (2001 census).
The forested areas are mainly located on the largest inhabited islands of Lesbos, Samos, Chios, and Ikaria, which are the more populated areas. The fact that anthropogenic activities are concentrated in the more vegetated islands increases the risk and hazard of wildfires in the North Aegean Region. Moreover, the complex and sharp relief, the mosaic of ecosystems and habitats combining with the human infrastructures are the main key elements to have to taking into account to support forest fire prevention and management as well as post-fire restoration.

2.2 Implementation of the North Aegean Region to the EUFOFINET project

In the frame of the EUFOFINET project the North Aegean Region has share with the other partners of the project its acquired experience in specific fields as good practices and vice-versa has adopted good practices from other partners, which are considering that they could bring an add-value to practices applied in the region in the prevention, restoration, fighting and management of forest fires.

Another important issue for the North Aegean Region as the official managing authority involved in the EUFOFINET Project is to take care to transfer the knowledge obtained from the project to all the services and organizations involved in the forest fire prevention and fighting: Fire Brigade, Forest Services, Municipalities, Army and Volunteers (and scientific institutions).

The **main objectives** of the participation of the North Aegean Region to the project are:

- Facilitate the transfer of relevant good practice able to improve regional and national policies efficiency for forest fire risk prevention and management.
- Disseminate to other partners the relevant know-how of the Region acquired in previous projects, such as the OCR-INCENDI cartography – mapping of forest aiming to support forest fire prevention and management so well as post-fire restoration for the islands of Lesbos, Chios, Samos and Ikaria, and the traditional practice of resin collection - cultivation, as activity reducing fire risk.
- Identify and promote common intervention procedures in order to define a flexible model(s) that could be utilized by any entity with an interest in forest and wild fire prevention and management.
- Establish an international network of institutional contacts and operational links in the fields of wildfire prevention and wildfire suppression.
- Attempt to harmonize common frames of reference in the EU with regards to wildfire prevention and wildfire suppression.

2.3 Synergy with the regional operational programmes

The EUFOFINET project is closely related with many other projects that the North Aegean Region is involved:

- FOR CLIMADAPT: a European project that aims at encouraging initiatives and innovative experiments for an adapted management of the Mediterranean wooded ecosystems to the current and upcoming impacts of climate evolutions. As a result of climate change and other factors, forests are facing increased risk of fire, soil erosion, landslides, etc.
- ICHNOS PLUS (IVC): focus on the transfer and deployment of a model of Regional Centre of Competence for One-Stop Shops and its mainstreaming into the regional polices through the ERDF Operational Programme.
- BIOBUS: to strengthen the awareness of the regional community on the use of biodiversity and innovation and of the benefits developing North Aegean to a competent, dynamic knowledge based region.
- EX-INT: collection - documentation of the experience which has been accumulated from the INTERREG projects starting 1990 till today.
- MOONRISES (ARCHIMED): Management, forestalling and attenuation of natural risks.
- WESTMUST: concerns the complete and viable management and protection of the cultural, natural sources and landscapes.

- CORI: identification and mapping of tsunami and other extreme sea level hazards for Eastern Mediterranean coasts.
- PACINTERREG (INTERACT): creation of a data base that includes all IIIC.

3) EUFOFINET Good Practices

3.1 Presentation

The five good practices had been chosen by the partnership for the relevance that these good practices have on the development and management of suitable policies and strategies on prevention, restoration and fight of forest fires.
In the EUFOFINET project, six technical workshops and seminars concerning each one a specific good practice (GP) were held. During the procedure, each partner, called **"donor partner"**, presented a description of its relevant experience and disseminated it by delivering specific documents.
The North Aegean Region, as already mentioned above, presented also its own experience in the good practices "Cartography" (GP4) and "Prevention" (GP3.2). Moreover, its external experts in forest fires, senior scientist researchers of the Forest Research Institute of Thessaloniki, presented an experiment in the frame of "Detection" (GP3.1)

The aim of these presentations was to bring the context and enough technical details, so well as financial information, to allow interested partners, called **"receiving or recipient partners"**, to integrate the entire or parts of this good practice in their own region via an action plan. A specific procedure allowed an exchange of information between donors and receiving partners in order to clarify the possibility of the transferability of the good practice.

3.2 Selection of good practices

The North Aegean Region decided the most appropriate good practices suitable for implementation and to be transferred as receiving partners are:

- Intervention – Strategies (GP1)
- Detection (GP3.1) and prevention (GP3.2)
- Cartography (GP4)
- Restoration of burned areas (GP5)

The present document **"action plan"** is dealing with the **good practice of intervention – strategies (GP1)**. It has been produced for the North Aegean Region entity by its external experts. The main concern of the action plan is to integrate the good practices of EUFOFINET project partners in the specific conditions of the region. The action plans concerning GP3, GP4 and GP5 are presented in other documents.

3.3 Description of the selected good practice "intervention - strategies (GP1)"

The North Aegean Region selected from the good practices presented two interventions for fighting wildfires that are not used in Greece.

The **Centre for servicing woods and forests of Castilla y Léon (Spain)** presented two direct interventions that are widely used in fighting wildfires: the **backfire** as suppression technique, and **dozers** making both direct attack on the flames and indirect attack removing biomass fuel.
The **Northumberland Fire and Rescue Service (England)** presented also the backfire as suppression technique.

It appears, according the demonstrations of the techniques and the achievements from their use the results against wildfires, especially large or intense fires, are excellent, and are being quite more effective than other intervention techniques as aircrafts or water pumping.

Dozers
The practice of use dozers presented by Junta de Castilla y León consists of the disposal of one to three dozer teams per province, ready to leave 24 h per day on transport trucks, in the high risk season. The rest of the year the dozer is doing prevention works. There are also additional dozers making forestry works all over the year, and they can give support in great fires. Special complex fires are supported by convoys of resources from other provinces.

The means used are:
A) Dozer squad: 1 articulated lorry, 1 bulldozer with angle and tilt blade movements (recommended 170-200 HP), 1 warning car (compulsory for big-size lorries), fuel tank, lorry driver and dozer driver. Budget: around 900€/day. Second dozer: working in prevention tasks. The contract is made on the planned surface to do, and the quote depends on the production rate at each site.
B) Support convoys are formed by 2 land crews of 8 people with tools, cars and equipment, 1 or 2 tank trucks, 2 rangers and 1 or 2 technicians (officers). The convoy can be completed with 1 dozer squad with 1 additional ranger.

The main factor of efficiency of the method is the dozers availability. There is a contract to provide the machine ready to depart immediately during high fire risk season. However, sometimes it is complemented with a second machine working on field, which is also available to support in a great fire.

The experience and specialization of workers are a key factor for the efficiency. By the moment, dozers and backfires are still working better than other tactics and the use of support convoys is becoming more frequent.

According to the demonstrations that took place in the meeting of Leon and the relevant videos, bulldozers are working in two ways:

- Direct fighting: it concerns fires of low vegetation (grassland or shrubland). The dozer moves along the front and with his knife slightly turned towards the fire throws quantities of soil in flames. When there is a fire creeping under trees, they apply the parallel method. The dozer moves parallel to the forehead at a distance of a few meters. On the way the dozer clean the ground from the shrubs, while it cutting trees and swept along toward the unburned side.
- Indirect intervention: reduction of the fuel amount by opening firebreaks in order to avoid the expansion of the front of fires. The crews fight the fire by applying the appropriate method and mainly the backfire.

Backfire

The method consists to set a fire along the inner edge of a fire line to consume the fuel in the path of a wildfire or change the direction of force of the fire's convection column. This wildfire suppression technique is not sufficiently used in Europe. To master this technique, it is necessary to work in a co-coordinated manner using experience acquired by present-day operators, backed up by the necessary research.

Demonstrations of the technique have been done at the workshops in Leon and Northumberland.

The main parameters of the method are:

- Backfire has to be applied from the highest places and then extends lower.
- The number of emerging outbreaks should be less, than the crews can control.
- The outbreaks should converge before reaching the front of the fire.

The advantages of the method are: the high efficiency of the intervention, crews are working is a safer environment, the fire is under control.

The disadvantages are: destruction of a part of the natural environment if it appears the intervention was not done in the appropriate conditions, high needs for training to the technique, the front of the fire is far and the need for coordination is extremely important.

An advantage both of the two methods is they can be operated day and night, in contrast to aircraft that are operated only during the day.

Besides, it's difficult to quantify the results due to the variability of number and complexity of fires between different years. In Castilla y Léon, the last 10 years the great fires (more than 500 Ha) have been widely controlled by the use of dozers and backfire.

4) Action plan framework - Implementation of the GP3 in the North Aegean Region

4.1 Description and analysis of the problem in the region

The region of North Aegean is by its topography and location a sensitive area in Greece. There is also a geographical isolation of the islands from the mainland and by consequence from a direct terrestrial intervention. Moreover, the vegetal formations, characterized by extreme high flammability, growing in these more arid Mediterranean climatic environments, are often subject of huge fire events. Major natural forests and mastic tree plantations of

Chios Island were burned this summer. In previous years extended areas were burned in Samos and Ikaria.

Frequent fires, already have reduced a part of the vitality of forests, and their potentiality of recovery, and many of them have been degraded, in lower vegetal shrub formations, as phrygana. The forest cover of the large islands of Northern Aegean (with the main forest vegetation) is reduced because of the frequent fires. Moreover, other forested areas, which are still characterized as forests, are now degraded because of their fragmentation due to openings for roads or by overgrazing, illegal constructions, etc.

Besides, forests are further degraded from a lack of management, which has as consequence an increase of fuel biomass. So, in Samos the end or reduction of the production of timber for ship building and large forest areas of unrecognized ownership, without management at all, combined with the laborious nature of the forest work activities, led to the abandonment of forests by the local population (even owners). The forest fires and diseases cease to be so sudden and rare events. They acquire ordinary and repetitive character. For Lesbos, the corresponding conditions of risk and forest degradation are mainly resulting from the abandonment of resin collection – cultivation and the limitation of the activity of collecting firewood. Moreover, the fragmentation of forest ownership discourages forest exploitation and the high cost of industrial timber transport outside the island reduces the interest of forest owners and loggers forest products.

By consequence, the large main islands of Northern Aegean are characterized on the one hand by overpopulated coastal settlements and areas favorable for tourism, and on the other hand, by abandoned from human presence settlements but also agricultural, agroforestal and forestal landscapes. Thus, both over-use and under-use of forest ecosystems lead to undesirable results.

The first reaction time in a wildfire is directly related to the difficulty of intervention and the intensity of forest fire, and depends of the time detection (by permanent or mobile observers). The performance of observers depends of the available number, their level of knowledge of the terrain, their resistance, the location of the observatory etc.

4.2 Objective of the transfer of the GP1

The North Aegean Region authority by adapting the good practice emerged from the EUFOFINET project on wildfire suppression strategies has as main objective the demonstration of the suitability of the techniques of backfire and dozers in the Greek context.

4.3 Strategy of implementation of the action plan

The North Aegean Region will apply the main elements of the good practices presented for:

- the use of dozers by the Centre for servicing woods and forests of Castilla y Léon (Spain), and
- the backfire by the Northumberland Fire and Rescue Service (England) and again Castilla y Léon.

Nowadays, in Greece, there is a requirement from the citizens and media to involve aerial means in alls the incidents of fires, because of the feeling of their “absolute” efficiency.

Another important issue is that backfire as intervention action is legally prohibited, while it used to be a traditional method of intervention in the past, when the Forest Service was in charge to fight forest fires.

The aim of an implementation of the two methods is to increase the efficiency of the fighting management by reintroducing the backfire technique and demonstrating the utility of the use of dozers.

4.4 Specific legal – regulatory framework

In Greece, until 1997 the Forest Service had the entire responsibility for the protection of forests from fires.
Since 1998, the Fire Brigade is in charge for the suppression of the fires in forest and vegetated areas in general (Law 2612/1998), with the assistance of the General Secretariat for Civil Protection. The jurisdiction of the prevention of forest fires is still remaining in the hands of the Forest Service.

Municipalities are also involved in the prevention of forest fires by undertaking the design and execution of “forest works” (e.g. cleaning of forest vegetation) in public forests and wooded lands in their area of authority after consultation with the Ministry of Agriculture.
Eventually, the Army, the Police and Organizations of Volunteers, which are operating under several laws and presidential decrees (1951/1991, P.D. 32/1992, 8281/1995), are also involved in the prevention and suppression of forest fires.

The Regional Secretariat of Civil Protection, which coordinates the services that fight forest fires, operates under the authority of the North Aegean Region.

4.5 Actions and schedule of implementation

In order to apply the strategy adopted for the action plan of wildfire suppression strategies, the North Aegean Region will demonstrate the efficiency of the intervention techniques of backfire and the use of dozers in the fighting of wildfires by organizing:

- training of staff of the Fire Brigade
- demonstration actions both of backfire and dozers and
- training sessions

For the implementation of the action plan the North Aegean Region will firstly send a crew of the Fire Brigade in order to training it to the two techniques.
Following, the North Aegean Region will organize demonstration and training sessions, where the crew will present the two techniques to the other fire fighters from the Fire Brigade and volunteers, so well as to dozers drivers.

Actions adopted:

1. Training abroad of the staff of the Fire Brigade

2. Demonstration actions
   2.1 Backfire technique
   2.2 Use of dozers against wildfires
3. Training sessions
   3.1 Backfire technique
   3.2 Use of dozers against wildfires

Completion period: 12 months, two (2) months for action 1, and 1 (1) month for each action (15 days by each sub-action) for the five main islands of the North Aegean Region (Lesbos, Samos, Ikaria, Chios and Limnos).

4.6 Operational implementation

The aim of the North Aegean Region is beyond its strict legal authority to bring efficient techniques useful in the fire fighting in Greece, by demonstrating them and training staff to their use.

The North Aegean Region already cooperates with Greek Forest and Fire Services in prevention works and with Fire Brigades and Volunteers in fighting forest fires. Moreover, the Regional Secretariat of Civil Protection, which coordinates services that fight forest fires, is under the authority of the North Aegean Region.

The North Aegean Region will organize both the actions of training and demonstration.

4.7 Evaluation indicators of the action plan

Time schedule

Action 1. Training abroad of the staff of the Fire Brigade: months 1-2.

Sub - action 2.1. Demonstration of the backfire technique: months 3 to 8, one month by island.

Sub - action 2.2. Demonstration of the use of dozers against wildfires: months 3 to 8, one month by island.

Sub - action 3.1. Training sessions in the backfire technique: months 9 to 10, one month by island.

Sub - action 3.1. Training sessions in the use of dozers against wildfires: 9 to 10, one month by island.

External expenditure

Action 1. Training abroad of the staff of the Fire Brigade: a crew of five fire fighters will be training in Spain and or N. England, estimated cost: 10.000 €.

Sub - action 2.1. Demonstration of the backfire technique: 20.000 € (cost of travel and subsistence, and material) (4.000 € / island).

Sub - action 2.2. Demonstration of the use of dozers against wildfires: 25.000 € (cost of travel and subsistence, and material) (5.000 € / island).

Sub - action 3.1. Training sessions in the backfire technique: 20.000 € (cost of travel and subsistence, and material) (4.000 € / island).

Sub - action 3.1. Training sessions in the use of dozers against wildfires: 25.000 € (cost of travel and subsistence, and material) (5.000 € / island).

Action plan funding

As an entity or in parts: public funds, European funds, sponsoring, integration in new projects, self-financed by the North Aegean Region or a combination of the previous.

Deliverables

Action 1. Training abroad of the staff of the Fire Brigade: number of staff, five (5).
Action 2. Demonstration actions: number, ten (10), two in each island (one by sub-action).
Action 3. Training sessions: number of staff, total 50-100, 10-20 by island.

5) Conclusion

The aim of the project EUFOFINET is to allow to "donor partners" to share their experience - "good practice" in wildfire prevention, restoration and fighting through the development of action plans to "receiving partners" in order to improve the efficiency of the policies of regional development.

The North Aegean Region has it-self transferred its relevant know-how acquired in previous projects in cartography of forest aiming to support forest fire prevention and management for the main islands, and the traditional practice of resin collection - cultivation, as activity reducing fire risk. Moreover, its external experts in forest fires presented a detection experiment.

The North Aegean Region is facing to a major problem in fighting strategies, prevention of forest fires and restoration of burned areas, because of objective facts of topography, such as isolation from the mainland, extreme high flammability of the vegetation, increase number of wild-fires, but also due to the lack of coordination of the services involved and the absence of official planning regulating pre-fire and post-fire interventions and management practices of forest and burned areas.

In order to take profit of the knowledge of the partners of the consortium, the North Aegean Region decides to be a "recipient donor" for the good practice "intervention - strategies" and to apply a strategy how to implement it through an action plan, adapted to the five large islands of the region (Chios, Lesbos, Ikaria, Limnos, and Samos), which comprises training of staff to the techniques of fireback and the use of dozers as suppression tactics and demonstration sessions.

The North Aegean Region with its participation to the EUFOFINET project has been in contact with good practices and innovative techniques in the area of the prevention, restoration and fighting of forest fires.
However, most of all, the participants of the North Aegean Region to the project, had the opportunity to exchange constructive scientific views, but also to develop a frame of warm personal contacts with the other partners.

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