EUFOFINET (European Forest Fire Network)

North Aegean Region: Restoration of forest burned areas action plan (GP5)

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 restoration of land burned by wildfire.

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 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 restoring burned areas (GP5)**. 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 GP1, GP3 and GP4 are presented in another document.

3.3 Description of the selected good practice "Restoration of burned areas (GP5)"

The good practice "restoration of burned areas" has been presented in a **synthesis document provided by the National Forests Office (Mediterranean Territory) of France (ONF)**.
The following section includes elements of this document in order to summarize the description of the good practice.

The definition selected for this topic when the project was launched is as follows:
"After the passage of fire, particularly in densely populated areas where public pressure is strong, the temptation is great to clear the traces of fire as quickly as possible, often requiring costly work. Here and there experience has shown that sometimes it may be wiser not to rush too much and to allow more time to think.
The good practice to be shared might be the use of a guide (on both policy and techniques) setting intervention priorities and practices to be implemented after the occurrence of fires."

This topic was the subject of a workshop in Valabre (France) from 16 to 20 May 2011. During the workshop, the five donor partners presented their practices in the meeting room, while a day of field visits in the Var and Alpes-de-Haute-Provence *départements* enabled the attendees to see how the measures were applied in different contexts and after varying periods of time.

Discussions between partners enabled them to compare the processes and measures that had been adapted to their specific contexts. This revealed many similarities which could be described in a general framework, identifying areas requiring consideration, priorities for action and a series of measures to be selected depending on the context.

The six cases presented by the different partners illustrate the responses applied to the various contexts (soils, vegetation, climate, fire regime) and primary objectives (production, protection, landscape). However they also highlight similar approaches from which a common general framework can be derived, which will be detailed in this synthesis.

ONF has attempted to define a comprehensive framework that addresses the majority of cases encountered, and which could be used as a toolbox from which solutions can be drawn depending on the local context.

This framework is based on four basic steps:
- Preliminary analysis
- Emergency measures
- Rehabilitation measures
- Monitoring and feedback

1- Preliminary analysis

This first step is crucial, to clearly identify the priorities and to use the resources in the right place at the right time. It should be conducted as soon as possible in order to define the emergency work to be carried out.

An optional preliminary analysis (a few days after the fire) can determine whether it is worthwhile pursuing this analysis, based on expert analysis of predefined maps using criteria.

This first approach can be systematised with the production of standard maps. It can be used as a decision support tool for policymakers and/or funding authorities to initiate more detailed studies. It can be improved by adding other criteria and by defining rules based on the quantification of these criteria.

It often makes sense to divide this study into two phases: emergency measures to be implemented very quickly and rehabilitation measures for which more time for consideration can be allowed.

The study should take into account the different roles of the forest.

The study should define the intervention priorities (spatial and temporal), specify appropriate measures, analyse any implementation difficulties (technical, land-ownership, legal, etc.) and estimate the cost of the actions.

2- Emergency measures

These should be implemented within the first few days or months after the fire (usually before the first heavy autumn rains, and at the latest before the rains of the following spring):

- public safety measures (such as reopening access, repairing damaged structures, felling dangerous trees),
- measures to control torrential flooding, and
- soil maintenance measures.

3- Rehabilitation measures

Some must be carried out fairly quickly (and can even be implemented concomitantly with some emergency measures), while others are more long term:

- treatment of burned timber,
- reforestation (natural regeneration is preferred, however in some cases it can be complemented or supplemented with a choice of appropriate species),
- support for recovered stands,
- preventive measures,
- environmental restoration measures, and
- revision of the management plan.

4- Monitoring and feedback

All the actions undertaken must be continuously monitored, and assessed in the short and medium term. In particular, once the emergency measures have been carried out, it is important to evaluate the results before continuing with the rehabilitation measures. Finally, an assessment conducted after all the measures have been implemented provides overall feedback on the entire operation.

The study can include monitoring arrangements from the start and schedule important milestones for a review or a new debate.

This monitoring should be documented as thoroughly as possible, through tables, reports, maps and photographs. The record of all this data will be used for feedback, training and sharing experience, and communication.

After allowing enough time to pass (which may be several years for the rehabilitation measures), it is important to obtain feedback.

The success of the restoration operation will be facilitated by the establishment of technical and financial partnerships throughout the process, from preparation of the study to monitoring and assessment, and including the implementation of actions.

4) Action plan framework - Implementation of the GP5 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. Besides the problem of coordination of all involved forces in the prevention and fighting of forest fires, 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.

These areas are immediately typically declared reforested, but they are not always under a specific post-fire management treatment. Because, the Greek administration do not applied a central planning to post-fire management of burned areas.
So, in the North Aegean region, the design is based on the knowledge, resources and tools available to local Forestry Services.
Many times, in absence of a typical protocol of post-fire management, inadequate actions and practices applied may cause greater damages to the ecosystems than that caused by the fire itself.

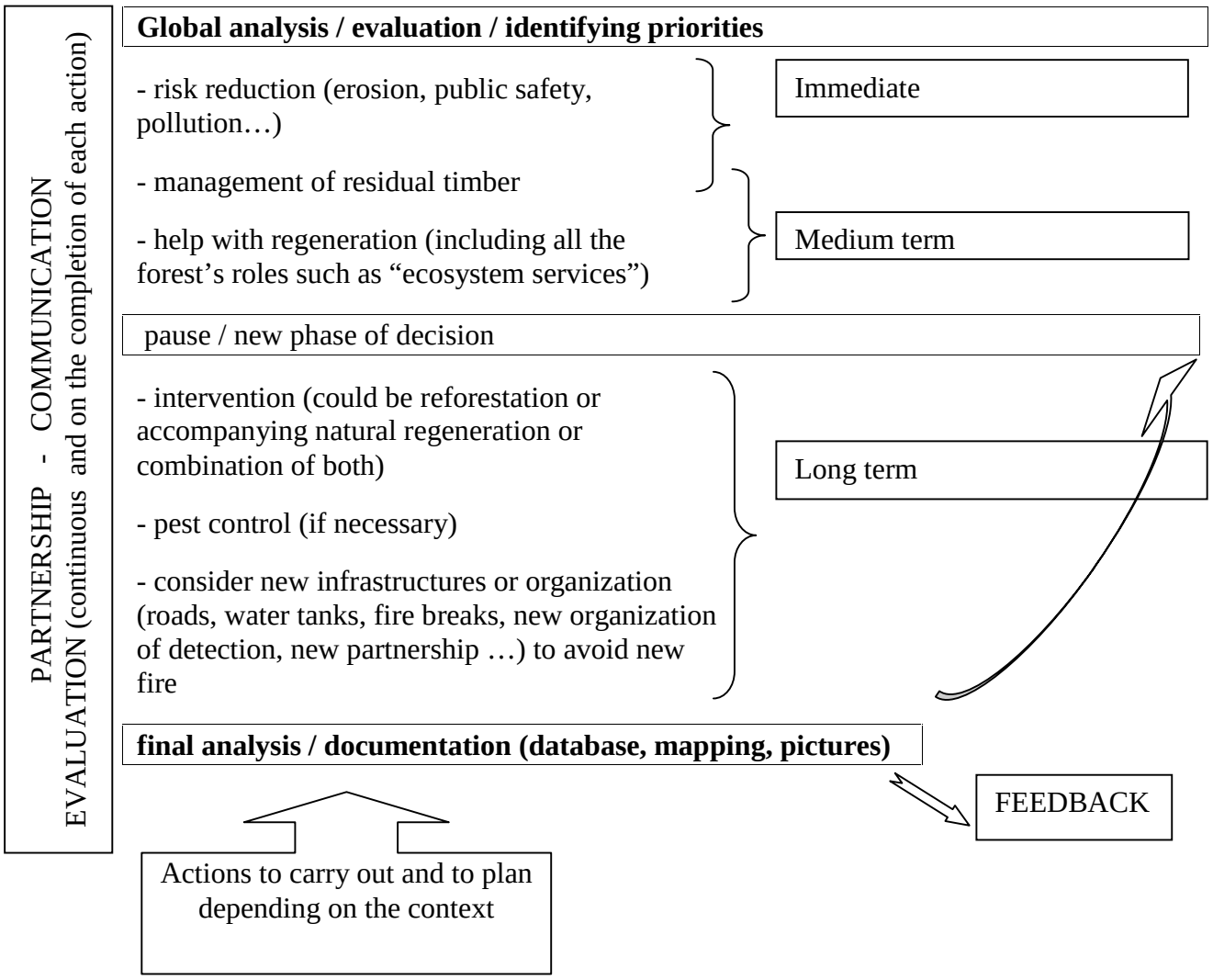
4.2 Objective of the transfer of the GP5

The North Aegean Region authority by adapting the good practice emerged from the EUFOFINET project on the restoration of burned areas has as main objective the establishment of a typical procedure for the restoration of burned and degraded land on the islands of the North Aegean.
This action plan also could be a model to be applied to the rest of country.

4.3 Strategy of implementation of the action plan

The North Aegean Region will apply the main elements of the synthesis of the good practices presented by ONF.

The procedure for restoration operations comprises phases /steps of actions and analysis that can be summarised in the following diagram:



The implementation varies according local environmental conditions and resources, so well as the intervention techniques, but the identified common key steps are applicable in any context.

The adoption of this procedure as protocol of post-fire management of burned areas allows avoiding wasting time and resources and increasing the efficiency of the actions applied.

4.4 Specific legal – regulatory framework

The Constitution of Greece itself, Article 24, is protecting the natural environment. A law states the protection of forests and wooded lands in general. It is forbidden to change the use

of forest and wooded lands, unless, if it is imposed for public interest (Section 1), national economy as rural development or other use.
Thus as already mentioned, there is an obligation to immediate typically declare burned areas as reforested.
The Regional Forest Service has the authority to apply reforestations and post-fire management in general.
The Regional Forest Service belongs to the Ministry of Interior and typically is administratively under the authority of the North Aegean Region. But, the policies regulating the frame of its interventions are decided at central state level by laws and decrees. Thus, the North Aegean Region does not have the jurisdiction to impose practices and regulations or to modify the policies implemented.
Unfortunately, there is still no law regulating in particular post-fire interventions and management practices of burned areas. So, as already mentioned, practices applied are based only on the good will, the knowledge and resources of the Forest Service.

4.5 Actions and schedule of implementation

In order to apply the strategy adopted for the action plan restoration of burned areas, it appears there is a necessity, in absence of law regulating post-fire management, to have a **protocol or a guide** describing phases / steps for assessing the needs for restoration after a forest fire.
This methodological and technical guide will thus be prepared to formalise the approach resulting in the decision to restore (or not) fire-damaged terrain, and the schedule of studies and work to be implemented according to the main tree - shrub species present in the Greek Mediterranean areas.

Already in a non-formal meeting of the Greek partners it was a preliminary agreement to support the development of such a guide and to take it into account as priority in order to adopt this good practice.
If such a protocol or a guide is produced after the consensus of all the Greek partners of the EUFOFINET project, it would be easier for the Greek Central Forest Service, which is responsible for the reforestation – restoration of burned areas, to adopt it as a central planning.

The North Aegean Region will take care to **disseminate the guide** by distributing it to all the stakeholders involved, not only in the restoration of burned areas but also in prevention and fighting fires.
In collaboration with the Forest Service and volunteers, the North Aegean Region plans to organize training sessions in the use of the techniques of the guide and several seminars in the main islands in order to disseminate the content of the guide to target groups, such as public services and volunteers, NGO, etc.

In this way, the North Aegean Region already distributed to the local Forest Services of the islands a technical book for reforestations of burned areas (Konstantinidis P. and Gatzogiannis S., 2001. Selecting tree species for reforestation in areas affected by fire, by Forest Research Institute & TT (Post Bank of Greece). Thessaloniki. ISBN: 960-86160-9-3. 184 pp. *In Greek*) that has been prepared by our external experts before the project.

Actions adopted:

1. Production and edition of a guide describing phases / steps for assessing the needs for restoration after a forest fire.
2. Official distribution of the guide.
3. Training sessions.
4. Seminars.

Completion period: One year, six (6) months for the guide (action 1) and another six (6) for the dissemination actions (actions 2, 3, 4).

4.6 Operational implementation

The aim of the North Aegean Region is beyond its strict legal authority to bring together all the Services and target groups of citizens involved in the forest fires prevention and fighting (see above) and to provide and disseminate the results of the project in general and the present action plan in particularly.

Thus, the North Aegean Region already cooperates with Greek Forest and Fire Services on management and protection of forests and restoration of burned areas. Moreover, the Regional Secretariat of Civil Protection, which coordinates services that fight forest fires, is under the authority of the North Aegean Region.

The experience and competence of the North Aegean Region in forest fires are mainly in Dissemination Activities and Cartography – Mapping, which were done for the first time in the region and probably in Greece as well by a regional authority.

The North Aegean Region will supervise the production by its current external experts from the Forest Research Institute of Thessaloniki in the frame of EUFOFINET.

Following, the North Aegean Region will edited the guide and distributed it officially, in priority to the Forest Service, but also to all the public services and target groups of citizens concerned by the forest fires prevention and fighting.

Finally, the North Aegean region will organize training sessions in the use of the techniques of the guide and dissemination seminars.

4.7 Evaluation indicators of the action plan

Time schedule

Action 1. Production of the guide: six (6) months, preparation of the methodological and technical guide and layout editing and printing.

Action 2. Official distribution of the guide: month seven.

Action 3. Training sessions: a total of four-six (4-6), duration three (3) months, spread over years 2013-14.

Action 4. Seminars: total of four-six (4-6), duration three (3) months, spread over 2014-14.

External expenditure

Action 1. Production of the guide: 15.000 € for the preparation and edition (cost of expertise and printing).

Action 2. Official distribution of the guide: 1.000 €.

Action 3. Training sessions: 12-18.000 € (cost of expertise and travel and subsistence).

Action 4. Seminars: 12-18.000 € (cost of expertise and travel and subsistence).

Action plan funding

As an entity or in parts: sponsoring, integration in a new project, co-financed by the four partners involved in the EUFOFINED project, self-financed by the North Aegean Region or a combination of the previous.

Deliverables

Action 1. Production of the guide: date of printing at month six (6).

Action 2. Official distribution of the guide: date of completion of distribution month seven.

Action 3. Training sessions: number / year two-three (2-3).

Action 4. Seminars: number / year two-three (2-3).

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 “restoration of burned areas” and to apply a strategy how to implement it through an action plan, which comprises the production and edition of a protocol – technical guide, describing phases for assessing the needs for restoration after a forest fire, its dissemination to public services and target groups of citizens, and the organization of training sessions and seminars.

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.

For further scientific information
Dr. P. Konstantinidis and Dr. G. Tsiourlis
Senior Research Scientists
Forest Research Institute
570 06 Thermi -Thessaloniki, Greece
E-mails: pavkon@fri.gr, gmtsiou@fri.gr

Legal responsible – Contact:
Athanasios Giakalis
Governor of North Aegean Region
77, Kountourioti street
81100 Mytilene
Greece

Represented by:
Regional Development Funds of North Aegean Region
3, Arg Eftalioti str
81100 Mytilene
Greece

North Aegean Region, September 2012