



Annex II of the MoU between EFI and PHOENIX:



EFI PROJECT CENTRE

FIRE ECOLOGY AND POST-FIRE MANAGEMENT

Work Plan, May 2005

Consortium Members

- **Aristotle University of Thessaloniki**
Greece
- **Association Internationale Forêt Méditerranéennes (AIFM)**
France
- **CEMAGREF**
France
- **Centro de Ecologia Aplicada Prof. Baeta Neves**
Instituto Superior de Agronomia
Lisbon, Portugal
Contacts:
Coordinator Francisco Rego: frego@isa.utl.pt
Phone: ++351213616080, Fax: ++351213623493
- **Centro de Estudios Ambientales del Mediterraneo (CEAM)**
Spain
- **Institut National de la Recherche Agronomique**
Unité de Recherches Forestières Méditerranéennes, Equipe de Prévention des Incendies de Forêt
France
- **National and Kapodistrian University of Athens (NKUA)**
Greece
- **Universidad de Santiago de Compostela**
Spain
- **Universidade de Aveiro**
Portugal
- **Universidade de Trás-os-Montes e Alto Douro**
Vila Real, Portugal
- **Università di Napoli Federico II (UNINA)**
Italy
- **University of Tuscia**
Italy



1. Abstract

There is a need for a cooperative network of European researchers specialised on fire ecology and post-fire management issues. In order to increase European cooperation and interaction between research groups, this network is ideally performed under an EFI Project Centre. This current network can help in the development of decision criteria for preventive post-fire forest management. The short term results to be achieved are: (1) to help providing a sound scientific basis for post-fire management options, (2) to provide an effective use of the acquired knowledge, (3) to define priorities for research on post-fire management and (4) to harmonise research efforts aiming at the development of common criteria for post-fire management decisions. Regarding this latter aspect, the EFI Project Centre PHOENIX can be a positive complementary effort to the ongoing program EUFIRELAB, constituting a specific task-force on post-fire management. In a longer term it is expected that the present Project Centre will provide an important contribution to the establishment of more resilient and less combustible forests.

2. Contents

3. Objectives	3
4. Relevance	6
5. Outputs	7
6. Work Programme	9
7. Consortium	12
8. Management of the Project	12
9. Budget	15
10. List of relevant references	17



3. Objectives

The main objectives of the Centre are in the development of decision criteria for preventive post-fire forest management. The proposed Centre has the following specific objectives:

- to obtain a sound database gathering the state-of-the-art of existing scientific knowledge concerning the fire characteristics of the different forest types and respective species;
- to develop a set of criteria which can be used to classify forest types in terms of the associated fire hazard and resilience;
- to define the potential and limitation of the various post-fire management options;
- to help developing the transfer mechanisms needed between research and its application by end-users in this specific issue.

The above stated objectives will be achieved and/or materialised by making use of different dissemination means. The expected main benefits are as follows:

- to provide a scientific basis for post-fire management options that allow adequate decisions by land managers;
- to provide an effective use of the acquired knowledge;
- to define priorities for research on post-fire management;
- to harmonise research efforts envisaging the development of common criteria for post-fire management decisions.

In a longer term we expect this Centre to provide the necessary conditions for the establishment of less combustible and more resilient forests, therefore contributing to diminish the dimensions of the annual catastrophe that forest fires represent in several European countries.



State-of-the-art in the research area



Post-fire management: a crucial aspect of the fire-problem

Forests and fires have always been associated, namely in Mediterranean-type climates. Because of this close relationship, the natural vegetation of fire-prone regions has evolved strongly influenced by the cyclical occurrence of fire. After fire occurrence, the initial stages of the succession are frequently dominated by highly flammable species. Considering that fire frequency has strongly increased due to human causes, it is nowadays very unlikely that this initial succession stages may naturally evolve to more mature and less combustible (less prone to fire propagation) vegetation types. Flammable vegetation recovers quickly after a fire event but fire also promotes more flammable vegetation, creating a positive feedback which also accounts for the increasing frequency of wildfires. In many other situations, natural vegetation has been replaced by single species forest stands, used for timber or pulp production. These stands often promote high-intensity fire behaviour given their structure and the intrinsic fuel properties of the respective species. When composed of conifers, their resistance to frequent fires is also very low, which originates considerable losses both from the economical and the ecological point of view. The result of this scenario is that fire has become the most important forest problem in several European countries, with an enormous environmental impact. The importance of this problem is unquestionable, no matter the way it is measured (lives lost, euros spent, hectares burned, m³ of wood lost, tons of CO₂ released). Moreover this problem concerns also the countries which are less prone to forest fires, as the disappearance of carbon sinks, the release of CO₂, and global warming have all become global threats.

On the other hand wildfires can be regarded as an opportunity (a window) to influence the direction of secondary succession towards more mature stages that could be less prone to fires. It is known for a long time that initial floristics after disturbance can play a determinant role in the subsequent patterns of development. In order to capture this narrow window of opportunity and break the fire cycle, it is important to use scientifically based knowledge to support the different management solutions for burned areas. There are good indications that, in order to reduce combustibility of landscapes, deciduous broadleaved species might be a solution, as they are less "preferred" by fire (e.g. Moreira et al., 2003). Besides the problem of combustibility it is also important to consider the resilience of the different forest types to fire. There is evidence that some species are remarkably more resistant than others. In terms of fire resistance, the insulating properties of the bark are determinant as well demonstrated by cork oak in Southwest Europe. Other species are remarkable by their capacity to establish new seedlings after fire, as for example the Aleppo pine in the Mediterranean Region (e.g. Arianoutsou & Ne'eman, 2000).



The present research status



A considerable effort has been put on forest fire research in recent years. For instance an ever-growing body of literature (e.g. the review by Fernandes & Botelho, 2003) testifies the advantages and limitations of fuel management. However, the same level of objectivity is absent in what refers to the conversion to less hazardous fuel types. Even if some research has been performed on the specific aspects of combustibility and fire resilience, two major deficiencies can be detected at this level:

First, there is still much more to know before we are able to have a comprehensive understanding of these characteristics, allowing a direct and current use of this knowledge in post-fire management actions. In particular there are important asymmetries between the knowledge levels corresponding to different forest types, characteristic of different fire-prone regions of Europe. Some species and forest systems are reasonably known whereas others have been completely forgotten. This is probably one of the strongest reasons explaining the lack of fire hazard indicators in the process of the Ministerial Conference for the Protection of Forests of Europe.

Second, there is undoubtedly a lack of knowledge transfer between the results obtained by previous research and their application in terms of post-fire management procedures. There is scientific knowledge not being applied, but there are also technical procedures which are not scientifically based or even contradicting the current state-of-the-art. Although there are some recently launched technical documents from FAO or some national organisations also approaching the problem of post-fire management, they are still too general to provide adequate solutions for the different situations in Europe.

One of the reasons for these two constraints is the lack of cooperation in this specific field. Research networks on forest fires have traditionally been more focused on fire issues than on the aspects of post-fire ecology and management. Under the existing network EUFIRELAB, established to enhance cooperation in forest fire sciences and technologies among teams of the Euro-Mediterranean region, the issues regarding the post-fire management need to be further developed, as they were not previously addressed previous attempts of coordinated research.

Some examples can illustrate the deficiencies previously focused. The characteristics of various plant species associated with regeneration after fire have been recorded in different ecological studies in different southern European countries and a very powerful database was created and maintained within the EUFIRELAB unit 4 and by the GCTE Fire Network (Functional Traits Analysis in Relation to Fire). However the consistent application of this knowledge has not yet been worked to be used in post-fire management. Many laboratory studies have addressed the ignition and combustion characteristics of Mediterranean forest fuels at the particle or fuel bed scales. However, these are poor surrogates for the potential fire hazard of a plant community, and comprehensive modelling efforts based on field studies of fire behaviour are exceedingly scarce in Europe, and are restricted to some shrub types or some types of pine stands.

Another example of knowledge gaps is related to the research on tree species resistance to fire. A few authors (Pausas, 1997; Botelho et al., 1998) modelled the probability of tree survival after fire but only a few important Mediterranean species have been studied, which precludes sound comparison between most species.

Best practices for post-fire management should be a by-product of the fire behaviour and fire ecology sciences, but such combination and application of knowledge have not been approached previously in a structured, consistent, comprehensive way.



4. Relevance

This consortium consists of a group of researchers from organisations of various countries in southern Europe, as they are the most affected by forest fires (Portugal, Spain, France, Italy, Greece). However other organisations dealing with various aspects of forests and fires at a European scale were also contacted in order to further develop the network after approval of the proposal.

Finally this issue is relevant for EFI research strategy in what concerns the "Management of forests under various pressures" in the research programme on Forest Ecology and Management.

5. Outputs

The research programme includes several actions and instruments with the aim to disseminate the PHOENIX results towards those involved in land management at local, regional and European level.

PHOENIX Web-Server

A PHOENIX web site will be created containing both missions and achievements of the network. It will include the project description, the partnership with the related WWW interlinks, links to other WWW sites related to the fire ecology and management application sector.

The project website aims at creating a reference point for information about the progress of the Project Centre and its events and scientific aspects. It is a channel for diffusion of the projects objectives and results open to the potentially interested audience. An open discussion list will be also set-up.

It will host the main PHOENIX results, including the "PHOENIX Guidelines on post-fire management" (see task 4).

The site is designed to be as well a support for the communication internal to the partnership to be used by the partners thanks to a private link via user identification and a password and hosting the documentation (scientific and management documents, publications and papers about and from the network). See also task 1.3 "Communication procedures".

Though in English, the PHOENIX homesite will offer to the partners the possibility of a link to local sections, to favour the link with the local operators and the information about events and cases of regional interest.

Finally, the PHOENIX website will be linked to the EFI website to ensure since the beginning a complete information flow within EFI and its visibility.

Information material

A "PHOENIX White Paper" will be prepared in order to promote the Project Centre and its objectives towards the communities of foresters and to diffuse the PHOENIX mission towards a wider audience. The White Paper will contain the project outlines, the partnership structure and the membership descriptions.

Moreover, other material (leaflet, posters, etc.) will be produced along the project in order to announce events, progress, results, etc. in various networks and European events in the field of fire ecology and management.

Such material will be distributed during national and international events such as conferences, workshops, meetings, and during project initiatives like the project conferences.



PHOENIX Newsletter

A PHOENIX newsletter will be published every year with the objective of informing the partners of the Project Centre and the target audience.

The Newsletter is considered as an important tool for the communication and the diffusion of the PHOENIX results inside and outside the partnership.

To validate the editing policy and the content of the newsletters a ad-hoc group within the Management Committee will be created.

It will include, together with the general information on the partnership, its progress activities, short articles produced by the members about the partnership and the related initiatives, as well as other important issues in the field.

The Newsletter will be available on the project website. However, to get better to the target of a professional audience of specialists in this area, a mailing list will be created for a personal electronic delivery by e-mail.

External contributions will be searched to enlarge the interest of the newsletter.

PHOENIX Conferences

For a major diffusion of the state of the art in the field and of project, aims and results, as well as to offer something valuable for addressing a wider audience, are instead planned two events, of a larger dimension and target: the "PHOENIX Conferences", that will be promoted and organised in order to become a meeting point for the technical operators in this field.

The PHOENIX conferences will present the state of the art, both in the fire ecology and management and in post-fire management tools for final users.

The Conferences will be accompanied by project meetings as an event restricted to the partnership.

The PHOENIX data portal

Through the PHOENIX website it will be possible to gather access to the data of some PHOENIX partners or other organisations that will adopt the PHOENIX guidelines for data. A initial set of data servers compliant with the proposed specifications (as foreseen in task 3) will be used to illustrate the vision and to demonstrate the feasibility of the proposed guidelines, to be the initial seed for a future knowledge of all interested stakeholders for the full benefit of decision makers, public and private organisations, planners and European citizens.

PHOENIX Workshop

One workshop at national level will be organised during the first year of the Project Centre in order to discuss with the decision makers, public and private organisations, planners and citizens the needs on post-fire management.

Advanced Course on post-fire management

An advance course on post-fire management will be organized in order to train new researchers, including BCs, MSc, PhD and post-doctoral researchers and for mid-career training of forestry professionals.



Technical guidelines on post-fire management and electronic handbook

For the technical guidelines (see also task 4.).

The outcome of task 3.2 will be an electronic handbook to be developed on the Action's website, defining different categories for fire hazard and the corresponding forest types. Since it is admitted that there is still a lack of knowledge allowing the classification of some forest types in Europe, the handbook will only include those forest types which are reasonably known, enough to fill the requirements of the classification scheme. The handbook will be planned in order to be updated as new knowledge is added by further research initiatives.

These options will constitute the basic goal of the handbook, subjected to be completed and updated as new scientific findings will come out.

PHOENIX is created by partners who have, even with different perspectives and commitments, a wide experience of work and of involvement with many kinds of stakeholders in the field of post-fire management. Almost all of them have previous experience in this precise field. They are indeed powerful channels for the dissemination of the PHOENIX results. They can use the Project Centre facilities as well their own ones and also in connection with other European projects in which they participate.

Since the coordinator is an EFI member, i.e. the Instituto Superior de Agronomia the dissemination actions will be strengthened through the whole EFI.

As regards the other channels present since the beginning in the PHOENIX partnership, we outline the linkage with two associations. The International Association for Mediterranean Forests "IAMF" will be involved in the dissemination strategy making it possible to establish links with partners sharing the same problems in the eastern and southern limits of the Mediterranean Region. Also, the International Society for Mediterranean Ecology "ISOMED", that promotes the MEDECOS meetings for more than thirty years has already shown interest into the proposed EFI Project Centre allowing to establish links with other regions with mediterranean climate in the world. These two Associations allow contact and dissemination towards their large network of Members.

Another component of the dissemination activities can take advantage of the existing EFI network with the other Project Centres.

6. Work Programme

The overall structure of the Centre was designed to achieve in an effective way the objectives presented.

The activity of the Centre will be developed according to four tasks:

Task 1: Scientific basis on post-fire management

Task 2: Technical recommendations

Task 3: Knowledge transfer

Task 4: Technical guidelines on post-fire management

Despite the sequential initiation of the tasks, some overlapping is expected to happen, as some developments of each task will need a considerable time to be completed (e.g. the edition of a book on post-fire management).



Task 1. A scientific basis on post-fire management

This task consists on gathering the state-of-the-art of existing scientific knowledge on post-fire management, including the fire characteristics of the different forest types and respective species. This will allow to detect the existence of knowledge gaps and to define essential guidelines for future research. The implementation of a research proposal aimed at filling these gaps will be strongly encouraged among participants.

Five different tasks are considered, since the different aspects to be tackled are very specific and need to be approached separately. The tasks intend to answer to five different questions about the fire characteristics of the different species and forest types and about the range of options to be taken. The different questions to be addressed are:

Task 1.1 What forest types are less likely to burn? This will be done by identifying in available databases and publications, the major land cover types (particularly forest types) avoided (and preferred) by wildfires;

Task 1.2 What are the characteristics of the dominant species that can explain the different preference to fire of the various forest types? This will be performed by analysing, from the available literature the characteristics of dominant species that make them more or less prone to burn, not only as individual plants but as parts of important forest ecosystems.

Task 1.3 What forest types are more resilient to fire? This will be based on the review of studies that assess resilience of the various plant formations.

Task 1.4 What are the species characteristics that control the different passive (a) and active (b) resistance to fire? This implies finding from existing studies the plant characteristics (traits) that are associated with the persistence of the species after fire and under different fire regimes

Task 1.5 What are the general findings of the fire history of some major forest types and species in southern Europe? This is based on previous works dealing with fire history based on different techniques such as pedomorphology, palinology and phytosociology. The first technique is relatively recent and is based on the identification of woody species from traces of charcoal remaining from past fires.

Task 2. Technical recommendations

This task aims to contribute to the production of scientifically-based decision criteria on post-fire management. It has two stages targeted to answer two sequential questions:

Task 2.1 What are the adequate forest types /species to use in forest conversion after fire and;

Task 2.2 What is the potential and the limitation of the various post-fire management options.

In order to answer the task 2.1 it is considered the creation of classification criteria concerning the fire characteristics of the different forest types at the European level. This has to do with the establishment of standards for the main characteristics involved such as flammability, heat content, combustibility and fire resistance. The achievement of a common understanding at this level will allow the development of a set of criteria, which can be used to classify forest types in Europe in terms of the associated fire hazard.

The answering of the second question will consist on the review of the regeneration-capacity levels for the major forest types. This will allow the establishment of realistic options for the conditions existing in the different fire-prone European regions.



Task 3. Knowledge transfer

This task will try to identify the reasons for the lack of effective transfer mechanisms between research achievements and its final application by end users. Since the situations will certainly vary for each country considered, the different teams integrating the working group corresponding to this task will be particularly concerned with the specific situation of the respective countries. This task will imply for example an assessment at the legislative, social, economic and institutional levels. After the assessment is done, a report on the issue will be released including suggestions on how to change the present situation by developing effective ways of applying the results of research on post-fire management by end-users.

Task 4. Technical guidelines on post-fire management

The overall aim of the PHOENIX Project Centre is the improvement of Fire Ecology and Post-Fire Management for a better management of fire-prone areas, both for the benefit of professionals and technical operators and as a communication tool to promote towards general public the interest and the appreciation of these areas.

As regard the objective of supporting better management and decision making, some deliverables of the project are intended to exploit the effort of the network partnership towards an enlarged external audience of interested parties: fire ecologists providers and experts on one side, forest management bodies, local authorities, technicians and researchers in forest domain on the other side.

For these reason the network achievements will be integrated into "Technical guidelines on post-fire management". Apart from offering a valuable product to train the stakeholders the Guidelines (printed and available on the web) will focus the Network on a tangible target exploitable towards a wider user audience.

The Guidelines will collect and organise the scientific results of the project task 1 to 3.

The Guidelines will then constitute a technical report of the tasks´s from 1 to 3, that is from the state of the art, to the technical recommendations and knowledge transfer, up to the technicality of creation of the web access of information on post-fire management.

The preliminary activity of this task is related to the definition of the methodology to produce the Guidelines and the design of their structure and content and is carried out in the initial phase of the project.

In a second stage, after the completion of the previous tasks, and based on their outcomes, progressive releases of the Guidelines will be produced and validated, also at a National level by the PHOENIX Partners.

At the end of the validation process the final version of the Guidelines will be ready for printing and publication.



Project Planning and timetable

The project will have a duration of five years according to the following phases:

- **Start-up (M 0-6).** In this phase the Project Centre will be established and made operational. The Management Committee will be created; the communication procedures defined and the project centre web server will be activated; moreover the method of work and the steps of the tasks 1, 2, 3, and 4 will be defined. Finally at the end of this period the First Meeting will be organised and the first issue of the newsletter published.
- **Operation (M 6-42).** It the core phase of the project, Phoenix will fully exploit its potentiality of action. The preparatory work for the Guidelines will be carried out and most of the work for the Guidelines themselves (Task 4) will be done. Moreover the electronic handbook to be developed on the Action's website, defining different categories for fire hazard and the corresponding forest types should be done.
- **Network development (M 36-60).** This phase is mainly devoted to the validation of the results achieved in the previous phase (e.g. **Guidelines** and **electronic handbook**) and to the promotion and development of the PHOENIX at European and at a National level with the aim of setting up a stable Project Centre.

7. Consortium

The consortium consists of forest research and training institutions from all around the Mediterranean basin.

The following list of organizations (in alphabetic order by country) participate in the activities of PHOENIX.

France

1. CEMAGREF*
2. Association Internationale Forêt Méditerranéennes (AIFM)
3. Institut National de la Recherche Agronomique (INRA), Unité de Recherches Forestières Méditerranéennes, Equipe de Prévention des Incendies de Forêt, France

Greece

4. National and Kapodistrian University of Athens (NKUA)
5. University of Thessaloniki, Greece

Italy

6. Università di Napoli Federico II (UNINA)
7. University of Tuscia, Italy

Portugal

8. Centro de Ecologia Aplicada Baeta Neves (CEABN-ISA*)
9. Universidade de Trás-os-Montes e Alto Douro(UTAD*)
10. Universidade de Aveiro (UAVR)

Spain

11. Centro de Estudios Ambientales del Mediterraneo (CEAM)
12. Univerdad de Santiago de Compostela, Santiago de Compostela, Spain

Other institutions contacted as possible participants in this type of research activities are:

DG-Joint Research Centre (SAI - Natural Hazards) - Dr. Jesus San-Miguel, Ispra, Italy

INRA - EUFIRELAB* - Dir. Jean Charles Valette, INRA Avignon, France

The Global Fire Monitoring Center¹ - Prof. Johann Goldammer, Univ. Freiburg, Germany

Education and Training Center for Forest Specialists² - Dr. Anatoly Petrov, Moscow, Russia

8. Management of the Project Centre

¹ EFI Member

¹ EFI Member



This work is aimed at providing the management and the operational co-ordination of the project. It includes several activities to provide the functionality of the Project Centre, a proper Management decision process, the communication among the partners and to cover the administrative aspect of the Project Centre.

This includes:

- the establishment of the Consortium Agreements among the PHOENIX Partners and EFI
- the management of the administrative and financial matters of the project
- the establishment of a PHOENIX secretariat and its operativeness
- the reporting to EFI headquarters
- the Management Committee activities
- the communication among the partners of the PHOENIX

Management activities will take place during the whole duration of the PHOENIX at each participant and with great emphasis at the coordinator to ensure that all aspects of logistics (especially preparation of general meetings) and complete fulfilment of administrative and financial aspects are dealt with without being a severe burden to the physical development of the PHOENIX.

Management activities will include the creation and maintenance of a permanent website with all shared information required.

Management Committee (MC)

As above indicated the management of the project centre includes the MC meetings and the related activities. The MC will address and will take decisions on the technical activity of the Project Centre. In particular, the MC will be in charge for the assessment and the evaluation of the tasks and to the production of the Guidelines and book, as well as for the scientific monitoring and validation of the content and schedule of the project events and the validation of the project deliverables. Moreover, it will be in charge for the possible changes in the project Work Programme and for solving possible conflicts.

Such activity will be carried-out through the communication partnership with e-consultation and during the MC meetings that will have also the scope to address and review the project activities:

- first meeting at the beginning of the project for the definition of the operative work plan and management procedures;
- intermediate meetings for an assessment of the projects results and in case for a revision of the project centre work programme; in particular, the major milestones will be critically assessed in meetings of the project and evaluated by the MC;
- final meeting at the end of the project for the evaluation of the project results and for planning the activities for the project follow-up.

The MC meetings will be scheduled approximately every year, whenever possible linked to the project conferences and advanced course, which represent the milestones of the project (see also Gantt chart).



The Management Committee (MC) will manage the PHOENIX in accordance with the Rules and Procedures for implementing and establish its course of activities in the first meeting. The MC will be constituted by the leaders of each Working Group (WG) and two additional persons.

The PHOENIX will involve five working groups each group being responsible for different tasks and sub-tasks, according to the following organisational plan:

- WG1 - Task 1 (Tasks 1.1 and 1.2) and task 4;
- WG2 - Task 1 (Tasks 1.3 and 1.4) and task 4;
- WG3 - Task 1 (Task 1.5) and task 4;
- WG4 - Task 2 and Task 4;
- WG5 - Task 3 and Task 4.

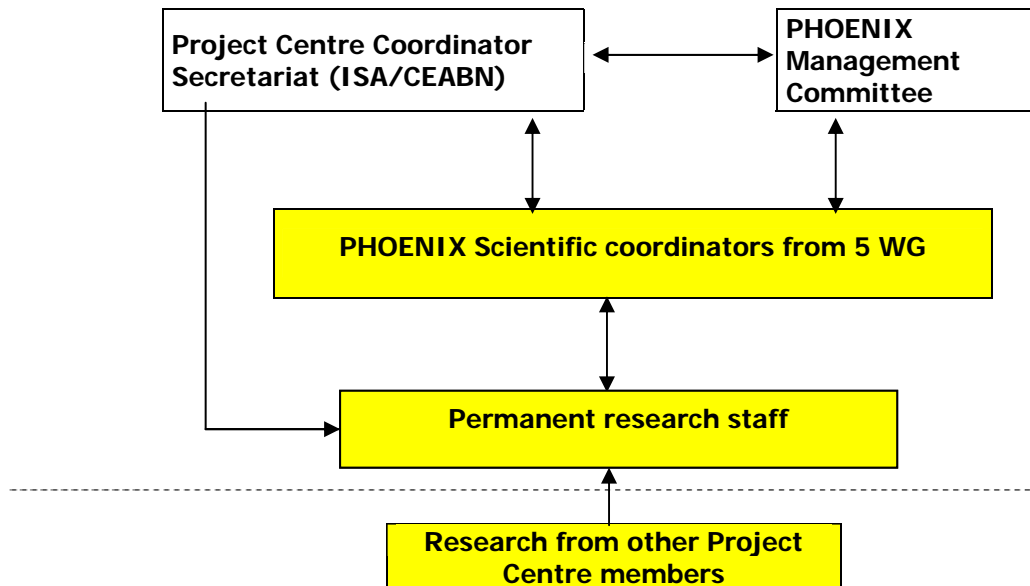
Most of the proponents will take part at WG4 and WG5, whereas the first 3 WG's will be constituted according to the expertise areas of each proponent. Each WG will be coordinated by a WG leader, selected among participants. Besides the co-ordination of the respective WG, each WG leader will be responsible for reporting the work progress to the MC.

In order to ensure coordination with other ongoing EU activities, a representative of the EUFIRELAB framework (which already includes a substantial part of the proponents of this Project Centre) will be invited to participate at all meetings. Whenever necessary, the MC will decide on the invitation of experts outside the Project Centre, eventually outside the European Union, in order to assure the best results for each Task/sub-task.

A scheme of project management is shown in Figure. The Management Committee will take the major decisions in what concerns the accomplishment of the proposed objectives. This Management Committee will integrate the leaders of each working group (WG) plus the coordinator. Both the Management Committee and the Working Group leaders will provide scientific guidance and other management prescriptions to the permanent research and administrative staff.



Management organisation scheme



In principle, one researcher from each institution will be a working group leader, taking advantage of the expertise and knowledge of the several members.

The permanent research and administrative staff will be based at ISA/CEABN, which will provide a permanent equipped room for this purpose.

This permanent staff will have the following functions:

- Implement a website and mailing list for the Project Centre;
- Gather available information for each of the scientific tasks, with the support of WG leaders and Project members;
- Helping project members in accomplishing their tasks;
- Incorporate information on data base;
- Prepare project submissions, in collaboration with other members;
- Prepare progress and technical reports for each of the tasks in the scientific programme;
- Organise the general meetings of Project members;
- Prepare publication of book on post-fire management;
- Collaborate with researchers from other Project Centre members that might visit the project headquarters, to gather information or exchange experiences.

Thus we hope that researchers from other institutions will temporarily join the ISA/CEABN staff in Lisbon, creating a dynamic exchange of people and knowledge.



Communication

At the beginning of the project the procedures for communication among the partners, with the possibility of sharing the relevant project documents will be defined and a communication network, based on Internet, will be exploited in such a way to constitute an operative tool for networking. With this aim a Web service with two levels of access will be provided: a public level and a consortium level (intranet) for web communication.

The public level will be accessible to all the people interested in the project (no login required) and will contain the following information: objectives, activities and running information, tasks, results, profiles of the partnership, specific contributions from the partners.

The consortium level will be available only for the PHOENIX members. This level will include:

- **PHOENIX Document Server.** It will consist of an archive of documents to be used by the partners to place the working documents;
- **Discussion list** among the partnership members. This discussion list is restricted to the partnership and is different to the forum open to the external audience (see also 5. outputs) that is established as a content of the web server. It deals with the various issues of the tasks, as an operational tool of the activity for the activity of the various tasks;
- A "MC" area to be used for discussing decisions as regards the project and its contents, as well as for consultation.

Quality control mechanism

The project activities will be continuously monitored against the work programme and the objectives of PHOENIX.

A continuous evaluation process on the level and degree of success in achieving the project objectives will be established along the whole project duration.

In the first part of the project, the principal indicators to measure PHOENIX objectives will be identified, together with their target levels; during the project the above parameters will be checked against the achieved progress results.

This process will constitute a framework for the self-assessment of the project. It will be carried on by the PHOENIX Management Committee and will ensure a check of the working progress and then the possibility of detecting possible problems and take the necessary corrective actions.

The strict connection among the members of the MC will ensure the overall constant monitoring of project activities.

This work foresees the following activities:

- **Definition of a Quality Plan.**

This will define different measurable objectives, their indicator parameters (and their thresholds) and their expected progress temporal achievements.

The relationship among the different objectives will be analysed in such a way to identify the risks related to possible delays.

- **Monitoring of the project working progress against the above plan**

The MC will be in charge for checking the achievement of the project objectives, according to the evaluation plan and for a quality control evaluation, as well as for defining and taking the necessary procedures to cover possible deviations from the schedule or from the project work programme content.

- **Peer-review**

Some of the most important project deliverables will be submitted for a peer-review by reviewer(s) external to the Consortium.



9. Budget

The possibility of this proposal to be fully successful is dependent upon the approval of existing applications at international level with the submission of the core group to a COST Action under the same acronym (PHOENIX) and at national level with the submission of two projects and the application to the Portuguese Government.

At present ISA/CEABN can provide the minimum facilities and personnel to initiate the Project Centre. An area inside the headquarters of CEABN at Tapada da Ajuda, a University Campus located in Lisbon, will be dedicated to the EFI Project Centre.

A permanent secretariat will be established. At the moment it is possible to dedicate some time of the existing permanent or temporary staff to the Project Centre.

The current list of personnel and time to be allocated to the management of the Project Centre is:

Permanent positions:

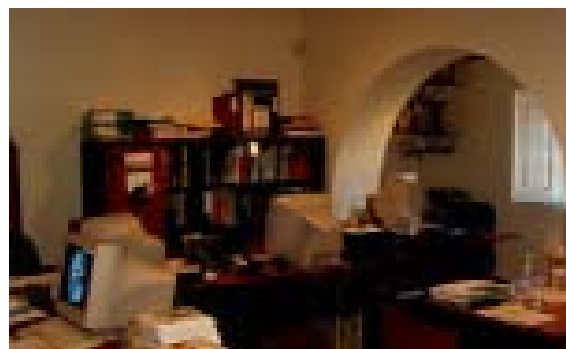
Francisco Castro Rego (Professor)	Time allocated 25%
Joaquim Sande Silva (Professor)	Time allocated 25%
José Alberto Rodrigues (Secretariat)	Time allocated 50%

Temporary positions:

Francisco Moreira (post-Doc)	Time allocated 25%
Filipe Catry (forest engineer)	Time allocated 25%
Maria João Maia (MSc project management)	Time allocated 50%

Maintenance or increase the secretariat will be only possible after approval of the proposal, and of the projects and governmental support requested.

Current national funding of CEABN will allow for two one-week visits of the Project Centre Coordinator to the EFI headquarters and for the Director of EFI (or a representative) to Lisbon for a full integration of the research activities in the Project Centre with those carried out by the various Programme Areas at EFI headquarters or at the other Project Centres.





10. Literature cited

- Arianoutsou, M. & G. Ne'eman 2000. Post-fire regeneration of natural *Pinus halepensis* forests in the East Mediterranean Basin. In: Ecology, Biogeography and Management of Mediterranean Pine Forest. G. Ne'eman, and L. Trabaud (Eds), pp 269-290, Backhuys Publishers, 407p.
- Botelho, H.S., F.C. Rego, e K.C. Ryan. 1998. Tree mortality models for *Pinus pinaster* of Northern Portugal. Pp. 235-240 *In Proc. 13th Fire and Forest Meteorology Conf.*, Oct. 1996, Lorne, Melbourne, Australia. IAWF.
- Fernandes, P.M., and Botelho, H.S.. 2003. The effectiveness of prescribed burning in hazard reduction. *International Journal of Wildland Fire* 12(2): 117-128.
- Moreira, F., Rego, F. & Ferreira, P., 2001. Temporal (1958-1995) pattern of change in a cultural landscape of northwestern Portugal: implications for fire occurrence. *Landscape Ecology*, 16: 557-567.
- Pausas, J.G. 1997. Resprouting of *Quercus suber* in NE Spain after fire. *Journal of Vegetation Science* 8: 703-706.
- Pausas, J.G., Ouadah, N., Ferran, A., Gimeno, T. & Vallejo, R. 2003. Fire severity and seedling establishment in *Pinus halepensis* woodlands, eastern Iberian Peninsula. *Plant Ecology*, 169.