



***“Design of a future common integrated land management scheme to protect natural resources in synergy with social and economic valorisation”***

***Regional workshop for the networking  
on best case actor practices***

***Camerino, Italy March 2014***



Provincia  
di Macerata



UNIVERSITÀ  
di CAMERINO



***“An Integrated European Model to Protect  
MEDiterranean Forests From Fire”***



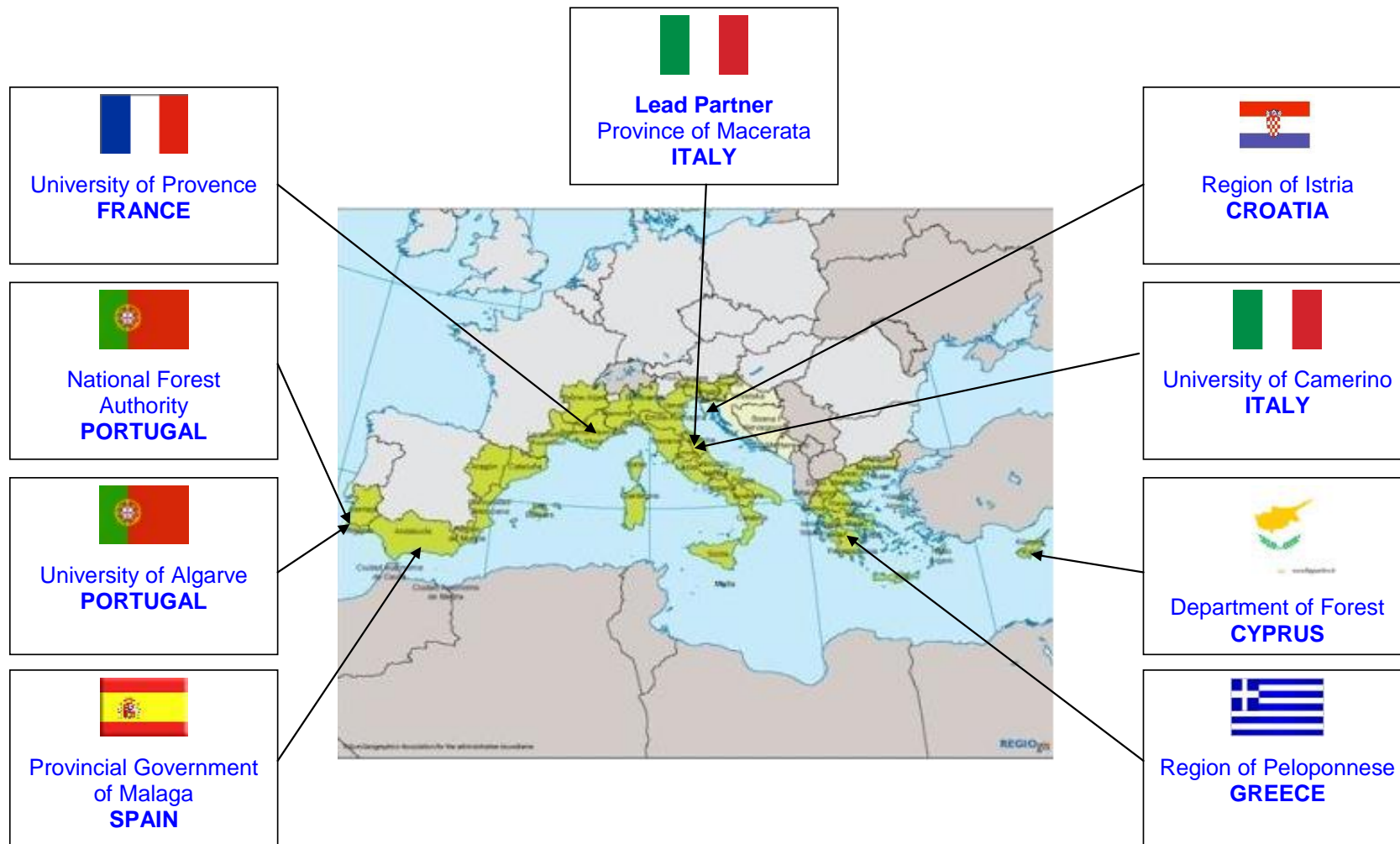
Projet cofinancé par le Fonds Européen  
de Développement Régional (FEDER)

Project cofinanced by the European Regional  
Development Fund (ERDF)





## PROJECT PARTNERS



Provincia  
di Macerata



Ministério da  
Agricultura,  
do Desenvolvimento  
Rural e das Pescas



Autoridade  
Florestal  
Nacional



# PROJECT ACTIVITIES

Joint development of a common model for the prevention of forest fires by coordinating the actions of:

- Prediction
- Prevention
- Fire fighting
- Recovery and restoration of the area





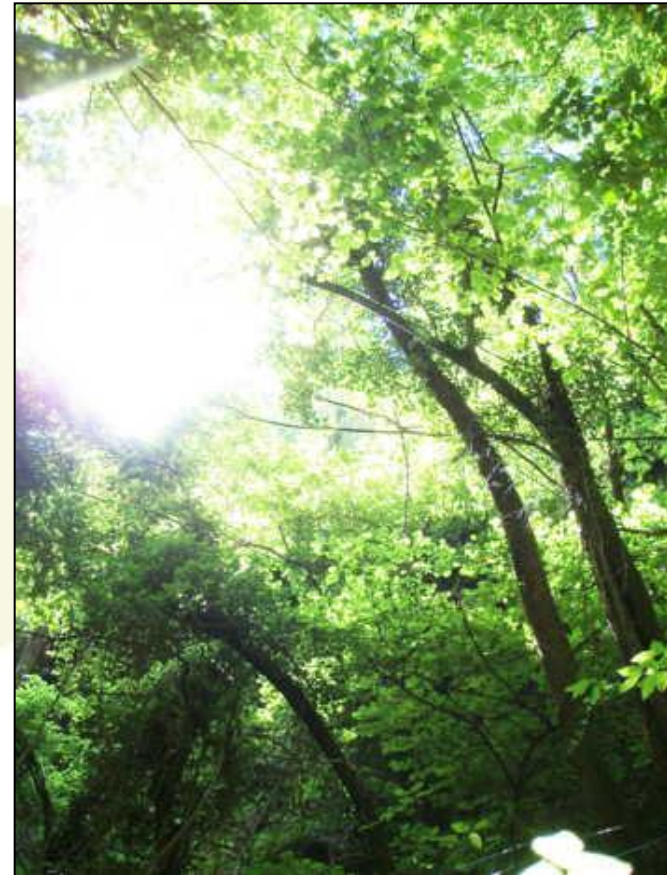
# INTEGRATED COMMON MODEL FOR THE PREVENTION OF FOREST FIRES

The model proposes measures which have been defined through the exchange of information and experience between the project partners, analysis of good practice reports and work carried out to develop three thematic areas of cooperation identified by the project:

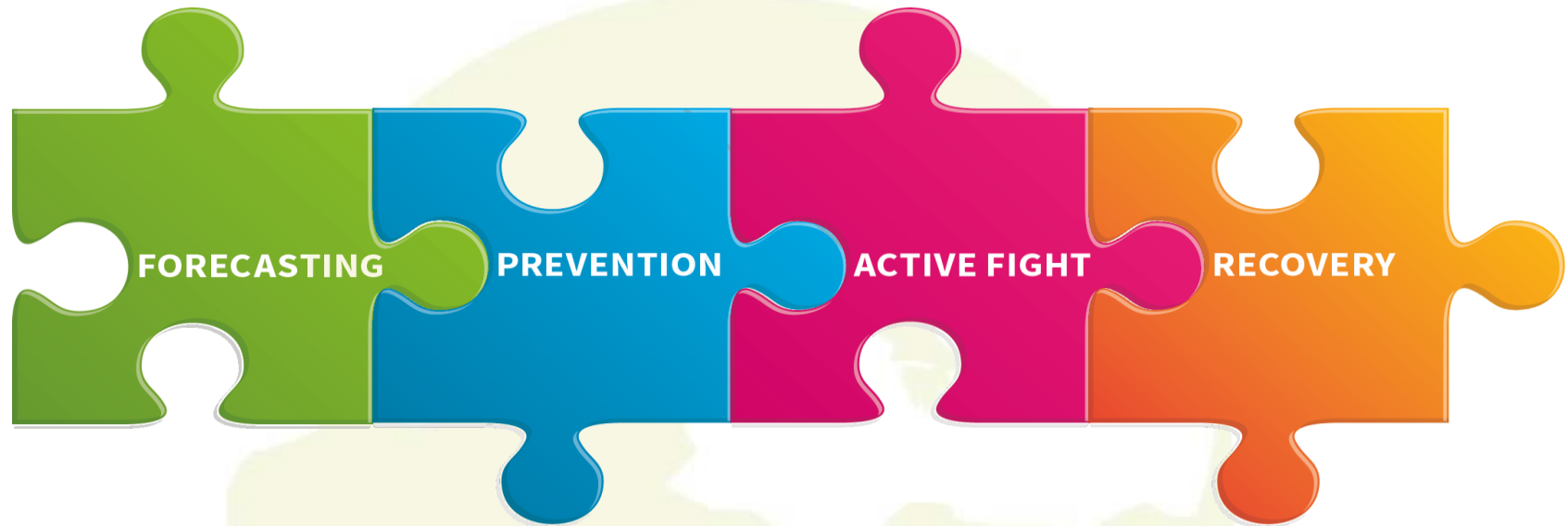
**WP1:** methods and techniques for mapping, assessing and monitoring of risks

**WP2:** sustainable forest maintenance, valorising biomass for renewable energy production

**WP3:** strategies of information, training and awareness raising for environmentally responsible behaviour in areas at risk and hazardous situations



# COORDINATED ACTIVITIES OF CIVIL PROTECTION



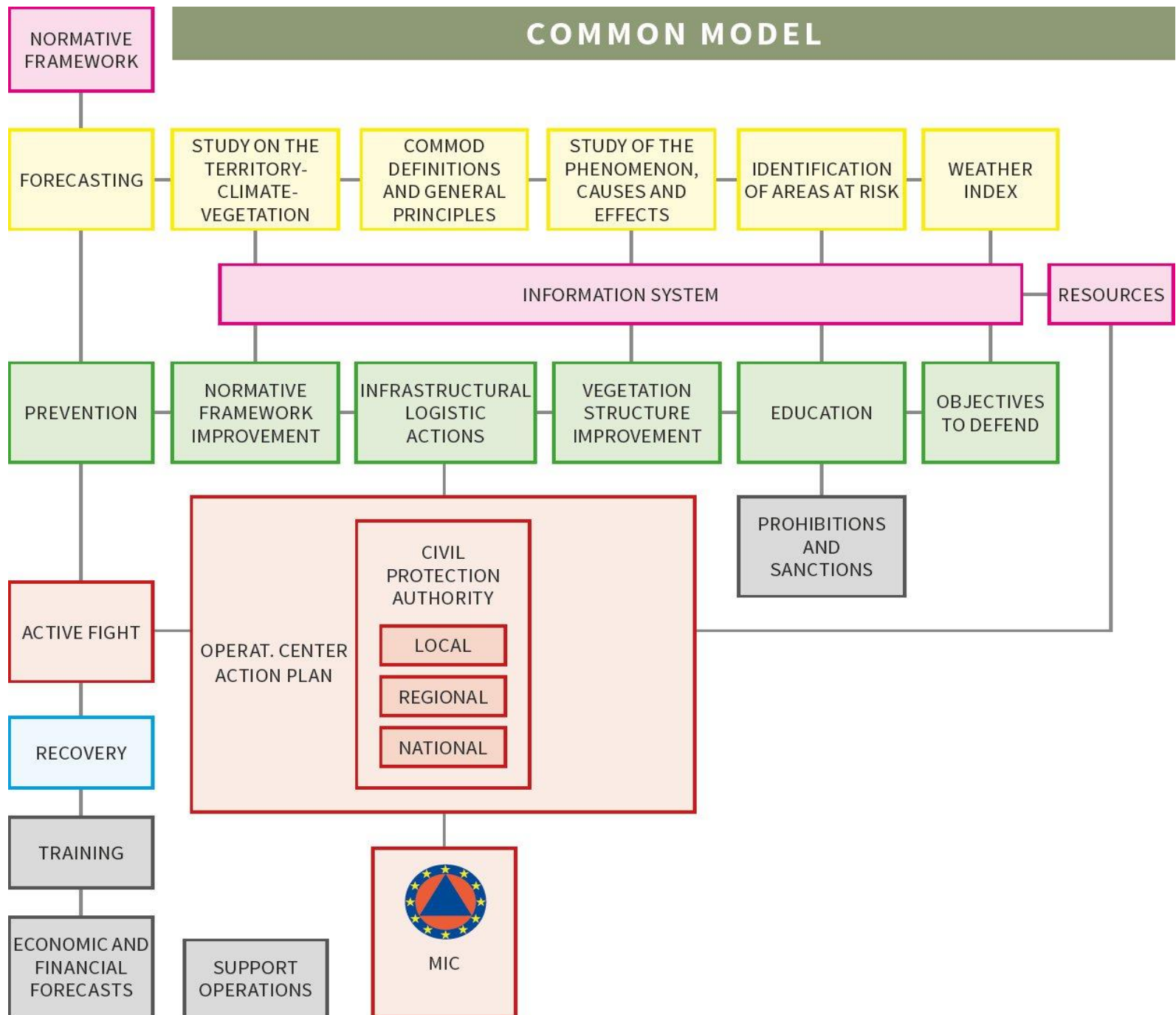
- STUDY ON THE TERRITORY
- STUDY ON THE CLIMATE
- STUDY ON THE VEGETATION
- IDENTIFICATION ON AREAS AT RISK
- SCENARIO OF RISK

- NORMATIVE FRAMEWORK IMPROVEMENT
- VEGETATION STRUCTURE IMPROVEMENT
- INFRASTRUCTURAL LOGISTIC ACTION
- EDUCATION INFORMATION AND DISSEMINATION

## • ACTION PLAN

- ACTION FOR RECOVERY AND RESTORATION

# COMMON MODEL



# STRUCTURE OF THE MODEL

## **REGULATORY FRAMEWORK**

### **Community Regulatory Framework**

Recognition of the forestry strategy and silvicultural principles that identify forests as a common heritage



### **National regulatory framework**

Stratified regulatory framework within which to operate



## FORECASTING

Activities aimed at the study and determination of the causes of forest fires, the identification of risks and the identification of areas of the territory subject to those risks (risk scenarios)

### **Territorial framework, climate and forestry (regional scale)**

- Spatial characteristics, structure and function of land use
- Land coverage and its current use
- Morphology of the terrain (exposure, steepness, geologic substrates)
- Identification of interface areas
- Climate conditions and description of weather parameters (temperature, rain, wind, humidity)
- Statistics on previous forest fires





# STRUCTURE OF THE MODEL

## **FORECASTING**

### **Definitions and general principles**

- Definition of forest (reg. EC n. 2152/2003)
- Definition of forest fire (reg. EC n. 2152/2003)
- Use of fire only when strictly necessary, with the control of the Authorities
- Socio-economic factors. Identification of social conflicts and conflicts of interest
- Necessary action: prediction, prevention, fire fighting, recovery of the area



## FORECASTING

### Types of Forest Fire

**Surface Fire**



**Crown Fire**



**Ground Fire**



### Phases of forest fire

**Ignition phase**  
(almost always the result  
of man)



**Propagation phase**  
(natural)



**Extinguishing phase**  
(action of man)



Good prevention organization should ensure extinction at the initial propagation phase

# STRUCTURE OF THE MODEL

## FORECASTING

### The forest fire: cause and effect

- Fire of unknown origin
- Fire of natural origin (e.g. lightening, volcanic eruption);
- Fire caused by negligence
- Fire caused by arson

**The causes:** rapid and profound change in the rural system, loss of the direct link between man & environment, low economic value of timber, conflicts over land use, increased recreational use of forests.

**The effects:** environmental degradation, social and economic, loss of the essential requirements for maintaining the life of living beings.

The forest is the most important container of biodiversity.





# STRUCTURE OF THE MODEL

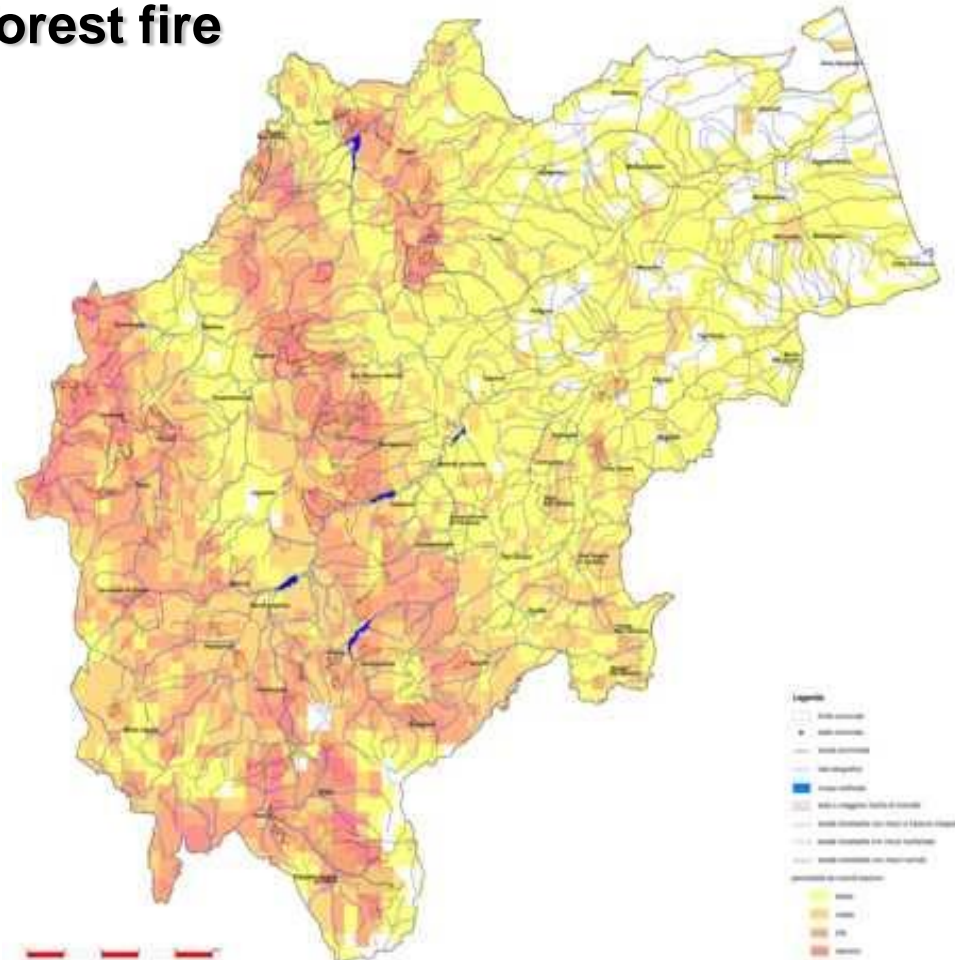
## FORECASTING

### Identification of areas at risk from forest fire

- The predisposition to forest fire
- Forest fire risk map
- Basis of the model

The phenomenon of forest fires is closely associated with many parameters that must be considered and analyzed simultaneously. Those most important for the mediterranean area are meteorological parameters, the digital terrain model, forest inventory , data base of the trigger points taking into account social factors.

The identification of the areas most vulnerable to forest fires, along with meteorological and climate data that indicate moments of elevated risk for the development of fire, represent the basis for emergency planning.





# STRUCTURE OF THE MODEL

## **FORECASTING**

### **Meteorological indicators of risk of forest fires**

To identify periods most susceptible to the danger of forest fires specific indices may be used (static or dynamic). Many authors argue that the FWI commonly referred to as the Canadian index can be successfully applied to Mediterranean countries.

It has been verified in the course of the project that such index can be successfully applied by modest adjustments.



# FOREST FIRE FIGHTING TESTING

Model developed from the University of Camerino



## PREVISIONE DI PERICOLOSITA' INCENDI BOSCHIVI Bollettino di Sabato 21/7/2012- ore 16:00

Inizio Validità 22/7/2012 ore 00:00 locali

Fine Validità 23/7/2012 ore 24:00 locali

**EVOLUZIONE METEO:** il transito di una perturbazione di origine scandinava determinerà sulla nostra regione una fase di tempo perturbato, associato ad una marcata diminuzione delle temperature.

### PREVISIONE METEOROLOGICHE PER DOMENICA 22/7/2012

**Cielo:** molto nuvoloso


**Precipitazioni:** diffuse, a prevalente carattere di rovescio o temporale. I fenomeni potranno risultare più abbondanti nella seconda parte della giornata

**Temperature:** in marcata diminuzione

**Venti:** moderati nord-orientali, forti lungo la fascia costiera

**PREVISIONI DI PERICOLOSITA' INCENDI BOSCHIVI PER DOMENICA 22/7/2012**  
(anche sulla base delle informazioni provenienti dal Dipartimento Nazionale della Protezione Civile - Servizio Rischio incendi boschivi e d'interfaccia)

Legenda Pericolosità		
<b>BASSA</b>		<b>MEDIA</b> 
		<b>ALTA</b> 

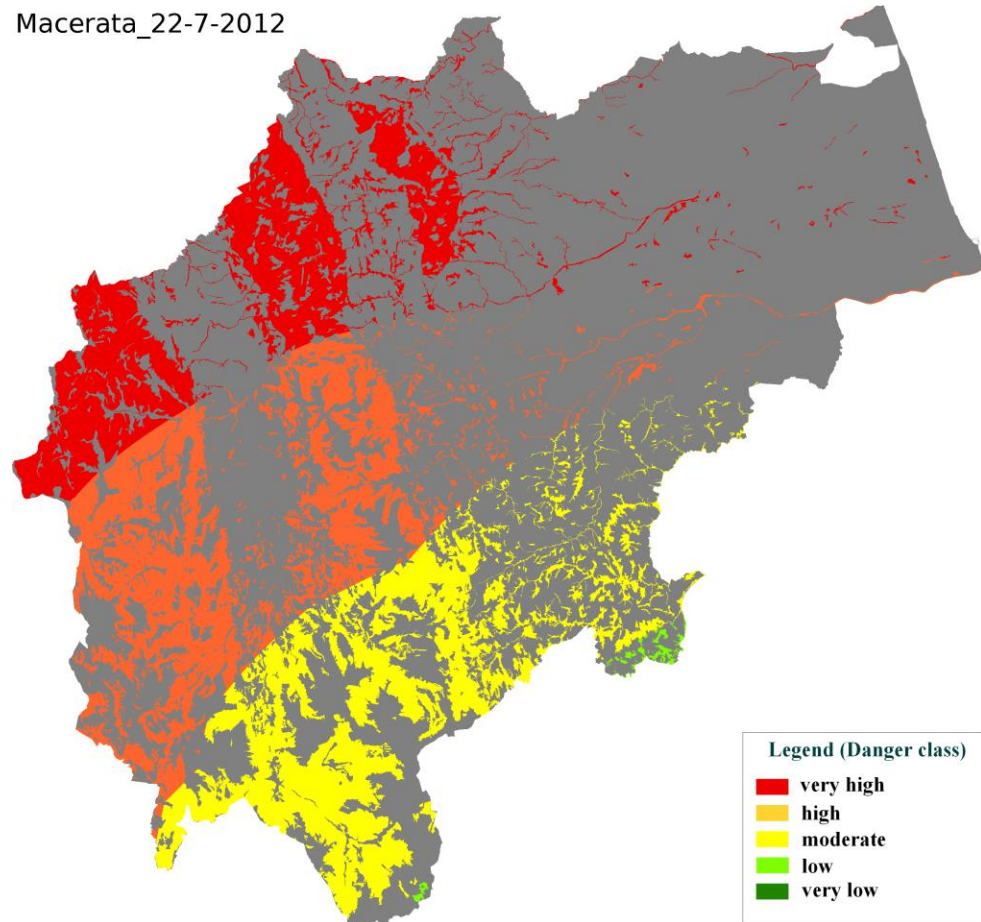
PROVINCIA	PERICOLOSITA'	
Pesaro-Urbino	BASSA	
Ancona	BASSA	
Macerata	BASSA	
Fermo	BASSA	
Ascoli Piceno	BASSA	

TENDENZA PERICOLOSITA' PER IL 23/7/2012	TENDENZA PERICOLOSITA' PER IL 24/7/2012
STAZIONARIA	STAZIONARIA


Note: Nessuna

Si invitano gli Enti e le strutture preposte alla gestione del rischio incendi di attuare quanto previsto nei propri documenti e piani di emergenza

Macerata\_22-7-2012



**Legend (Danger class)**

-  very high
-  high
-  moderate
-  low
-  very low

# FOREST FIRE FIGHTING TESTING



Model developed from the University of Camerino

## PREVISIONE DI PERICOLOSITA' INCENDI BOSCHIVI Bollettino di Sabato 28/7/2012- ore 16:00

Inizio Validità 29/7/2012 ore 00:00 locali

Fine Validità 29/7/2012 ore 24:00 locali

**EVOLUZIONE METEO:** l'azione dell'anticiclone africano sul Mediterraneo centrale continua ad assicurare sull'Italia centro-meridionale tempo stabile e molto soleggiato. Lieve flessione delle temperature dalla giornata di lunedì.

### PREVISIONE METEOROLOGICHE PER DOMENICA 29/7/2012

**Cielo:** sereno o al più poco nuvoloso

**Precipitazioni:** assenti

**Temperature:** stazionarie o in ulteriore lieve aumento rispetto alla giornata di sabato

**Venti:** occidentali sui settori interni dove assumeranno prevalente carattere di garbino, a regime di brezza lungo la costa

### PREVISIONI DI PERICOLOSITA' INCENDI BOSCHIVI PER DOMENICA 29/7/2012

(anche sulla base delle informazioni provenienti dal Dipartimento Nazionale della Protezione Civile - Servizio Rischio incendi boschivi e d'interfaccia)

Legenda Pericolosità		
BASSA	MEDIA	ALTA

PROVINCIA	PERICOLOSITA'	
Pesaro-Urbino	ALTA	
Ancona	ALTA	
Macerata	ALTA	
Fermo	ALTA	
Ascoli Piceno	ALTA	

TENDENZA PERICOLOSITA' PER IL 30/7/2012

TENDENZA PERICOLOSITA' PER IL 31/7/2012

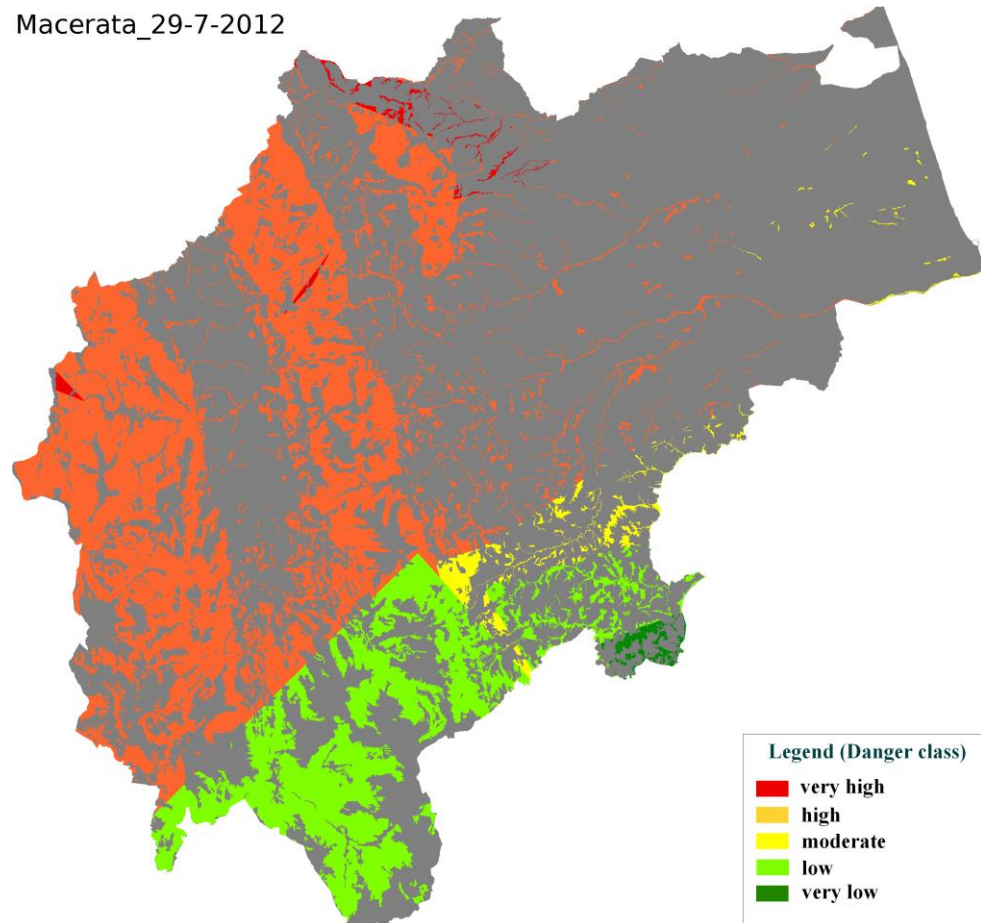
IN DIMINUZIONE

STAZIONARIA

Note: Nessuna

Si invitano gli Enti e le strutture preposte alla gestione del rischio incendi di attuare quanto previsto nei propri documenti e piani di emergenza

Macerata\_29-7-2012



Legend (Danger class)

- very high
- high
- moderate
- low
- very low



# FOREST FIRE FIGHTING TESTING

## LEVELS OF DANGER

1 July to 15 September

**LOW**

n. 16 (2012)  
n. 07 (2013)



**STATE OF ALERT**

**MEDIUM**

n. 35 (2012)  
n. 61 (2013)



**STATE OF PRE-ALARM**

**HIGH**

n. 26 (2012)  
n. 09 (2013)



**ALARM PHASE**





## STATE OF ALERT

**We have state of alert between the 1st of July and the 15 of September, this is the maximum danger time for forest fire.**

All activities are carried out every day from 2.00 p.m. to 8.00 pm.

The President of the Province or his delegate, in agreement with the the Prefect and the Director of the Civil Engineering Sector, checks the availability of the operating structures of the Provincial Civil Protection:

- Provincial Commands of the State Forestry Departement
- Provincial Command of the Fire Departement
- Police Departement
- Italian Red Cross
- National Health Service Structures
- Voluntary Organizations
- Armed forces
- It is also verified the availability of the components of the Provincial Civil Protection

**The end of this step is the passage to the PRE-ALARM PHASE**

## STATE OF PRE-ALARM

**Pre-alarm phase starts when the level of danger for forest fire is medium in accordance to the Bulletin of the Functional Center of the Marche Region.**

The President of the Province or his delegate, in agreement with to the Prefect and the Director of the Civil Engineering Sector:

- Inform the Provincial Committee of Civil Protection.
- Extend the coverage of the SOI from 8.00 a.m. to 8.00 p.m..
- Inform the organizations and institutions of the Provincial Civil Protection structure and update them on the evolving situation.
- Check the ready availability of the staff of the Province of Macerata for the control of the territory.
- Activate the Provincial Police and integrate it with Mobile Units operating in the risk areas, during the night too.
- Inform the mayors of the risk areas;

**The PRE-ALARM PHASE ends when:**

- The level of dangerousness becomes low;
- The Functional Center of Marche Region sends out the Bulletin with high level of danger that identifies the ALARM PHASE

## ALARM PHASE

**The alarm state starts when the level of danger of forest fire is high, in accordance to the Bulletin of the Functional Center of the Marche Region**

The President of the Province or his delegate, in agreement with to the Prefect and the Director of the Civil Engineering Sector:

- Convenes the Provincial Committee of Civil Protection, in restricted form, too
- Establishing an executive committee - for 24 hours a day – in the operation room of the Civil Protection
- Inform the authorities and institutions of the Provincial Civil Protection structure and updates them on the evolving situation
- Check the ready availability of the staff of the Province of Macerata for the monitoring of the territory and organize supervisory shifts
- Strengthen the monitoring in the provincial areas with high fire hazard - during the night too – through the intervention of Provincial Police and other forces, made available by the Prefect of Macerata, to integrate the activities of the Mobile Units
- Inform the mayors of the risk areas

**The ALARM PHASE ends with a medium or low level of dangerousness**

## PREVENTION



Activities aimed at addressing predisposing factors of the initiation and development of forest fires. The synergy of forest interventions, agro-pastoral farming interventions, infrastructure interventions in the territory, dissemination, mitigation of social conflicts limit the phenomenon.

### Forest Interventions

Forest maintenance interventions are aimed at maintaining the high economic interest of the forest.

Typical interventions aimed at decreasing vulnerability:

- removal of wood material and, in case of impossibility of removal, distribution to facilitate rapid decomposition
- the cultivation/ replanting of conifers mixed with hardwood
- cleaning grass verges along roads (ordinary and forestry roads),
- interventions to improve the forest with the reduction of forest debris
- compulsory adoption of self-protection plans (with incentives) by forestry companies





## PREVENTION

### Infrastructural interventions in the territory

- Roads and railways: avoid build-up of dry biomass along roads and railway banks;
- Urban interface areas, parks, archaeological sites: maintenance plan for vegetation in these areas
- Forest road network: maintain effective methods
- Firebreaks: dimensions according to the morphological characteristics of the land and forest
- Water supplies: natural reservoirs, artificial reservoirs, small temporary tanks
- Helipads: suitable location
- Surveillance points: allowing an optimal view of the surrounding area at risk. Radio connection.
- CCTV facilities: connected to a control center (operating room). Detection equipment - visible and infrared



## PREVENTION

### Dissemination and intervention activities

Activities should be addressed to all citizens to raise awareness amongst the population about the subject forest fires

Communication should disseminate information on :

- the causes and effects of forest fires
- illustrate institutional activities
- areas subject to risk
- periods of maximum danger
- rules permanent and temporary (with relative penalties)
- norms of behaviour and autoprotection for various circumstances
- telephone numbers to facilitate the citizen-to-institutions relationship
- telephone numbers for citizens to report hazardous situations (not always 112!)



## RESOURCES

The type, content and territorial location of resources to actively fight forest fires must be identified

### Infrastructural Resources

- map of forest roads
- map of water supply points
- map of surveillance points
- map of CCTV systems
- map of the airfields and helicopter landing pads

### Technical Resources

- Fire department resources
- Forest service resources
- Institutional resources (Regions, Provinces, Municipalities)
- Voluntary Civil Protection

### Human Resources

- Fire Fighters / Fire Department
- Forest service resources
- Institutional resources (Regions, Provinces, Municipalities)
- Voluntary Civil Protection



# STRUCTURE OF THE MODEL

## ACTIVE FIGHT

Preliminary identification of:

- Phases of interventions (normality, attention, pre-alarm, alarm, recovery, normality);
- institutional elements and operational structures to be activated (gradually) during alarm, the various institutional levels;
- composition, responsibilities of the operating structures.

The Operations Room is of fundamental importance to fire fighting, as a centre of coordination and decision-making

In an emergency decision makers and representatives of the operative structure act through the Operations Room.

The local authority (Mayor) is of fundamental importance as the highest authority of local civil protection for the first rapid response organized. A good local organization is the most effective and best guarantee for the success of efforts against the phenomenon of forest fires, because early intervention is paramount over any other enforcement action.





## **PERIODS AT RISK OF FOREST FIRES, PROHIBITIONS AND SANCTION**

In each region are identified:

- The area at risk
- The period of risk
- The actions that can lead to the initiation of a forest fire

In the areas and periods of risk of forest fire all actions seen as hazardous are prohibited and penalties are applied



## **PRIORITY OBJECTIVES TO BE DEFENDED**

The identification of priority areas to be defended will follow this criteria:

- human presence
- vegetation and environmental quality: natural protected areas (parks, nature reserves, SCI and SPA)
- coniferous forests
- limited accessibility in the context of potential spread of fire



# STRUCTURE OF THE MODEL

## TRAINING

Should provide the appropriate human resource capacity to intervene.

Simulation activities:

- Exercises at local / regional level carried out annually
- International exercises



## ECONOMIC AND FINANCIAL FORECASTS

The activities should be adequately supported with financial programmes







Fiuminata  
Macerata (IT)  
24/08/2011







***Thank you for  
your attention***



Provincia  
di Macerata



CIVIL PROTECTION SERVICE



EUROPEAN OFFICE

**dott. Luigi Vissani**