



FIRE MANAGEMENT IN NATURAL AND CULTURAL HERITAGE SITES AND OTHER PROTECTED AREAS

COORDINATING CENTRE: GFMC Freiburg, Germany

REPORT ON THE RESULTS OBTAINED WITHIN THE COORDINATED
PROJECTS FOR 2014

GFMC

1. **Work package 1: Survey of Natural and Cultural Heritage Sites of the EUR-OPA Participating Countries**

A total of 433 World Heritage Sites (WHS) of the EUR-OPA Member States were extensively surveyed. The sites are divided into Cultural, Natural and Mixed sites. In the beginning, the sites were classifying according to their fire regime into four classes: **(a) Fire-dependent or fire-adapted:** WHS with ecosystems where the present species have evolved in presence of fire; excluding fire from them may cause alterations in the system. **Fire-independent:** WHS that naturally lack of fuel or ignition sources. **(b) Fire-sensitive:** Sites with ecosystems adapted to fire where an inappropriate introduction of fire may cause negative impacts. **(c) Threatened:** WHS which have not evolved with fire and negative impacts are expected if burned. After the classification, a thorough and detailed search was made for each WHS looking for fire events that have affected or/and threatened them by scanning the media collections on GFMC website, search engines and for the case of natural WHS the assessment made by the First World Heritage Outlook¹. Overall, 55 Natural, Cultural and Mixed WHS have been affected by fire on the EUR-OPA countries. The survey analysis is still on progress.

Two workshops were carried out during the first year of the project:

1.1 **International Workshop "Fire Management in Protected Areas and Cultural and Natural Heritage Sites". Meeting of members, partners and observers of the Council of Europe / EUROPA Project "Fire Management in UNESCO World Natural and Cultural Heritage Sites and other Protected Areas" (27 June 2014, Freiburg, Germany)**

The project and its initial achievements were presented. The presentation revealed that Protected Areas and Natural Heritage Sites are currently under immediate fire threat. Some ideas to improve the work on the survey were extracted during the discussion session among the participants. An example on

how WHS exposure to fire can be assessed was presented by GFMC staff with the preliminary results of the pilot study entitled "Assessment of wildfire risk in Holy Mount Athos".

1.2 **Regional Workshop "Transboundary Fire Management in Protected Areas bordering Greece, Albania and the 'Former Yugoslav Republic of Macedonia'" (13 September 2014, Ohrid, "Former Yugoslav Republic of Macedonia")**

Representatives from the "Former Yugoslav Republic of Macedonia", Albania, Greece and the GFMC met at the Ohrid Lake World Heritage Site to discuss wildfire threats in Ohrid region and Prespa Lake Protected Areas. An assessment of the fire-threatened protected areas of the Balkans region was presented and several ideas surged to improve the development of the report and clarification of issues related to some countries of the Balkans. An agreement for the preparation of a project for fire management in transboundary areas of Ohrid and Prespa regions was drafted.

2. **Work package 2: Assessment of Wildfire Risk in Holy Mount Athos**

2.1 **Fuel Sampling**

All the areas in the study site were stratified on vegetation maps according to the dominant vegetation type and forest fuel load was estimated with standard methods for inventorying surface biomass in 49 plots by conducting two field campaigns in the area carried out by GFMC staff.

1 www.worldheritageoutlook.iucn.org



Figure 1. Fuel sampling

2.2 Fuel Modeling

Fuel models were created by following a two stage clustering procedure: Ward's minimum variance method in combination with the k-means method and hierarchical clustering. Overall, 6 fuel models representatives for the whole area were produced.

2.3 Fuel mapping, ancillary spatial data set and UNESCO structures mapping

Fuel mapping were conducted by following RapidEYE & GEOBIA & machine learning approaches. This method presents reliable, wide area, multi temporal coverage at a compelling (5 m) resolution Mt. Athos (500 sq. km).

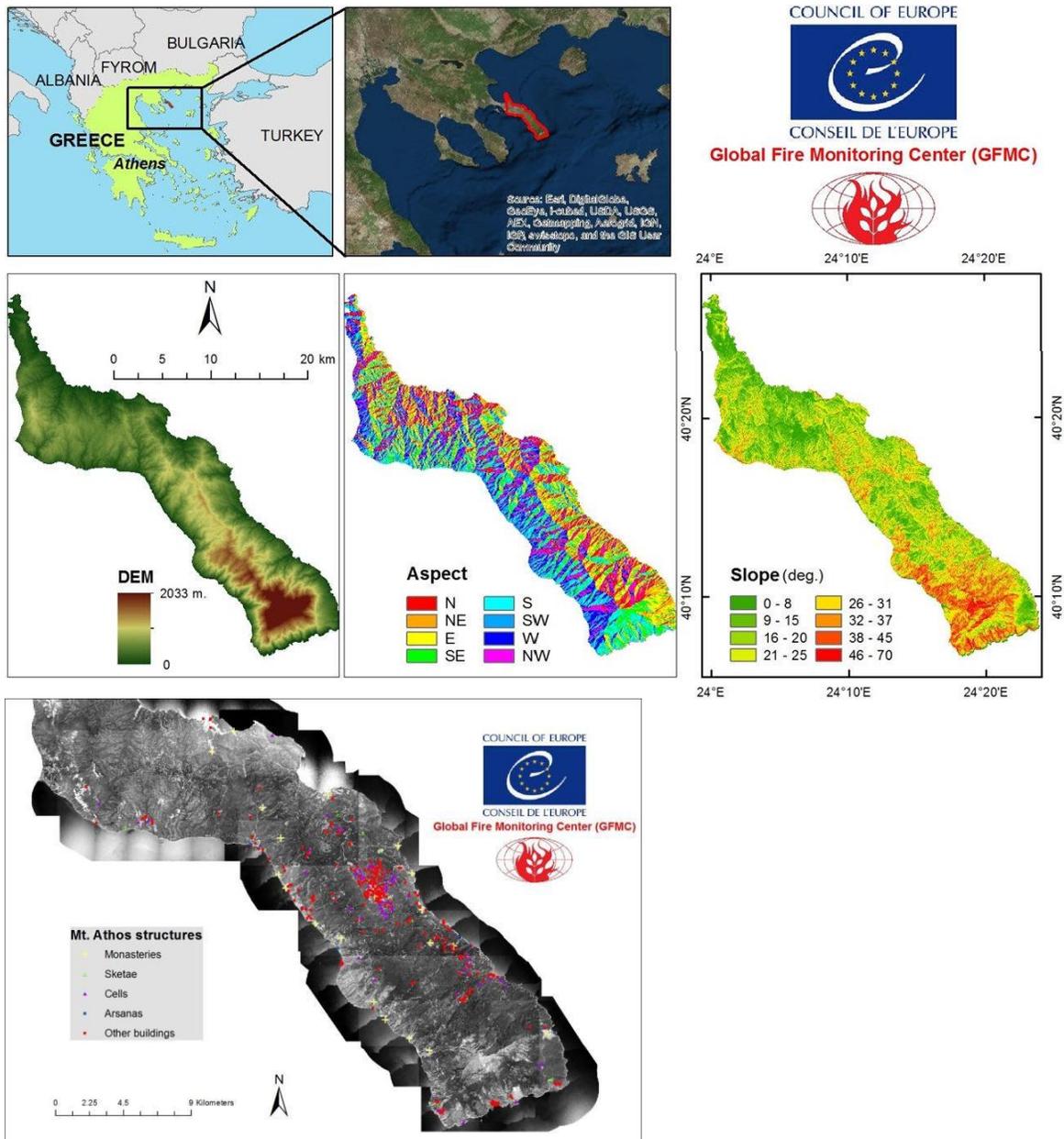


Figure 3 (left). Ancillary datasets Figure 4 (right). UNESCO structures mapping

3. Originally planned associated activities

Originally it was envisaged to present the preliminary results at the IUCN World Parks Congress (12- 19 November 2014, Sydney, Australia). A proposal was submitted for organizing a dedicated event.

The proposal was not considered. In addition, funding for travel costs by sources supplementary to the project was difficult to obtain. Thus, the plan was dropped and participation at the World Parks Congress cancelled.

4. The 2015 phase of the project

The proposed plan to organize a regional conference on fire management in UNESCO World Heritage Sites and other protected areas in Europe, with inputs from other regions, will be realized. A scientific article about the pilot study entitled "Assessment of wildfire risk in Holy Mount Athos" will be prepared and it will be submitted for publication in a peer reviewed journal.