

# **LIFE4OAKFORESTS in Habitat 91AA\*, Natural Park Vena del Gesso Romagnola (IT4070011), Italy**

## *Proiectul LIFE4OAKFORESTS în Habitatul 91AA\*, Parcul Natural Vena del Gesso Romagnola (IT4070011), Italia*

Serena PETRONCINI, Massimiliano COSTA

### **Abstract**

*Life 16NAT/IT/000245 has the aim to generate conservation management tools for increasing structural and compositional biodiversity in Natura 2000 oak forests and is implemented in different members, regions and countries of Hungary and Italy. The coordinating beneficiary is Ente di gestione Parchi e Biodiversità Romagna (Italy) while the other beneficiaries are Bükk National Park (Hungary), Balaton Upland Park (Hungary), Duna-Ipoly National Park (Hungary), ETTE (Hungary), Centre for Ecological Research Hungarian Academy of Sciences and WWF Hungary. This project aims to:*

- *identify which are the natural oak forests conditions that needs to be target for a nature conservation management. There are no primeval forests left in Hungary and Italy;*
- *increase biodiversity of EU priority oak forests such us habitat 91AA\* (511 ha Italy) and 91G0\*, 91H0\*, 91I0\* and 91M0 (1555 ha in Hungary), in National and Regional Parks in protected Natura 2000 sites;*
- *eradicate invasive species;*
- *demonstrate the best practices of oak forests nature conservation;*
- *management tools;*
- *increase public awarness about the importance of the forests';*
- *biodiversity.*

*This project will focus on the reconstruction of natural forests conditions by collecting, examining papers and residual natural forests and by the examination of the nature conservation treatments carried out until now.*

*Elaboration of conservation forest management guideline, purchase oak forests for securing the biodiversity, effects of forest management and detection of the effects of treatments will be monitored according to a monitoring protocol. An intensive awareness activity will be carried out for stakeholders and general public.*

**Keywords:** *LIFE4oakforests, old-growth forests, Natura 2000, oak forests, habitat 91AA\*, biodiversity*

### **Introduction**

Life4oakForests Life 16NAT/IT/000245 is an international project financed by EU and provides conservation management tools for increasing structural and compositional biodiversity in Natura 2000 network oak forests. The project

is implemented in different members, regions and countries of Hungary and Italy.

The coordinating beneficiary is Ente di Gestione Parchi e Biodiversità Romagna-MAR (Italy), while the other beneficiaries are Bükk National Park Directorate (Hungary), Balaton Upland Park Directorate (Hungary), Duna-ípoly National Park (Hungary), ETTE (Hungary), Centre for Ecological Research Hungarian Academy of Sciences and WWF Hungary.

The total budget of the project is of 7.980,586 Euros. The expected start date was the 1st July 2017 while the expected end date is the 31st December 2026.

#### **Life4OaksForests aims:**

- to identify the natural oak forests conditions and what should be the target of nature conservation management;
- to increase the biodiversity of EU priority oak forests such habitats 91AA\*, 91G0\*, 91H0\*, 91I0\*, and 91M0 in the National Parks' managed protected Natura 2000 sites;
- to eradicate invasive species;
- to demonstrate the best practices of the oak forests nature conservation management tools. Especially to protect microhabitats for saproxylic insects and insectivorous birds. And address oak forests of the project areas to an evolutionary path of old-growth forest;
- to increase the public awareness about the importance of forests' biodiversity.

#### **Life4oakforests is articulated in different actions:**

*Action A1:* elaboration of ecological nature conservation oak forests management guideline based on scientific reference information on natural oak composition and structure (A1.1), direct observation and survey of old growth forests in Hungary, Italy and Europe (A1.3), examining conservation treatments carried out in Hungary and Italy (A1.4) and elaboration of a monitoring protocol (A1.2).

*Action B1:* purchase of land with oak forests for securing the biodiversity of the area (about 40 ha in Italy in habitat 91AA\*).

*Action C1:* reconstruction of natural forests structure in the project areas (C1.1), reduction of game impact (C1.2), suppression of invasive species (C1.3), producing and replanting seedlings of the species characterizing the priority habitats (C1.4), ex-situ breeding of some saproxylics insects using LIFEeremita project results (C1.5), realization of ecotonal hedges around the purchased forests in Italy.

**Action D1:** Monitoring the effects of forests conservation management action and detection of the effect of treatments. The Economic and Social impact assessment.

**Action E1:** an intensive awareness-raising will be carried out for stakeholders and general public (E1.1). Collection, elaboration and publications about the developed management guideline and the results of their ecological nature conservation management according to the monitoring (E1.2), guidelines for the forests habitat development (for land users) on the potential oak habitats (E1.3) and ecosystem services for professionals (E1.4).

There will be intensive networking with the other projects and specialist working with forests' nature conservation (E1.5). An international conference will be organized to evaluate and share results and experience of the project (E1.6) and the involvement, awareness rising of stakeholders and decision makers (E.1.7).

**Action E.2:** Awareness-raising for general public, including films, games, booklets, brochures (E.2.1), the website (E.2.2), the notice boards at project sites (E.2.3), the media activities (E.2.4), a specific awareness campaign about numerous ecosystem services provided by natural forests in Italy (E.2.5), the Layman's report (E.2.6) (Project Life4Oakforests Handbook, 2017).

### **LIFE4oakforests in Italy**

Life4oakforests in Italy is in the Regional Natural Park Vena del Gesso Romagnola (ZSC/ZPS IT4070011) IT, Region Emilia Romagna, province of Ravenna. The Regional Natural Park Vena del Gesso Romagnola has an extension of 6,000 ha (60Km<sup>2</sup>), an altitude between 100 and 515 m above sea level. The medium quote of the Gypsum steep slope is of 400 m. Gypsum is a salt, and it precipitated in coastal lagoons about 6 millions of years ago (during the Miocene Messinian geological period) during a long drought era, when the Adriatic sea dried up, being isolated from the Atlantic Ocean. The slopes run from East to West, facing South on one side and North on the other side: this causes a local warm and dry microclimate on one side and a cool and shady microclimate on the other side, generating in both the two slopes very different ecosystems (about 50 plants associations and 17 habitats in the Annex I of Directive 92/43/EEC). The area is unique for its vegetation, for the numerous caves and animal species: 1000 plant species are recorded, seven endemic plants, 22 species of ferns, 30 species of orchids and one IUCN endangered and the Eagle owl (*Bubo bubo*), the wolf (*Canis lupus*) and wild cat (*Felis silvestris*) are the most predators. Bats, with 19 species and eight species in the Annex II of the 92/43/EEC directive, are the most important group of animals. There are big wintering colonies, the largest with 18.000 individuals of Schreibers' Bat (*Miniopterus schreibersii*) and important breeding colonies,

including the very rare Mediterranean Horse-shoe Bat (*Rhinolophus euryale*). The two habitats involved in Life4oakforests are habitat 6210\* (Seminatural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) with important orchid sites: 64.19 ha) and habitat 91AA\* Eastern white oak forests (*Peucedano cervariae-Quercetum pubescentis*): 92.63 ha. Both of them are priority habitats.

The 6210\* habitat is locally characterized by arid semi-natural meadows with *Bromus erectus* and *Brachypodium rupestre* of the alliance *Bromion erecti*, mixed with bush such as *Juniperus communis*, *Rosa canina*, *Crataegus monogyna* or by natural garrigue and dry meadows with *Helichrysum italicum* and *Bromus erectus* and many chamaephytes, on thin and rocky soils (clay, gypsum, sandstone). The 91AA\* habitat is locally characterized by the association *Peucedano cervariae-Quercetum pubescentis*, with the species *Quercus pubescens* (dominant), *Fraxinus ornus*, *Ostrya carpinifolia*, *Sorbus domestica*, *Spartium junceum*, *Scabiosa columbaria*, *Silene nutans*, *Dorychnium hirsutum*, *Peucedanum cervaria*.

The project areas in the Gypsum Vein Regional Natural Park are five (Gesso, Monte Penzola, Riva di San Biagio, Monte Mauro (Figures 1-2), Carnè -Rontana) for a total surface of 511 ha in which are prevalently dominated by habitat 91AA\*. The long tradition of forest management and the exploitation of the woods of the Vena del Gesso Park, as well as of the woods in most of Italy, generated forests with the following characteristics:

- Monoplane and even often monospecific;
- Poor presence of dead wood on the ground and standing dead trees (stump, snags and coarse woody debris);
- Absence of natural dynamism.

Life4oakforests will create new conservation management tools with the target to address in a long term, the forests of habitat 91AA\* of Vena del Gesso Regional Natural Park towards an old-growth forest model. Old-growth forests have mainly the following characteristics: high quantity of plants and animal, biodiversity, high quantity of standing dead wood, lying deadwood, and spread woody debris, presence of many old and large trees often with cavities and decaying branches. In Italy it is very difficult to find old-growth forests in habitat 91AA\*, due to the fact that this is a habitat that has been always exploited by humans. *Downy oaks* were commonly used as wooded pastures, particularly for pigs and cattle, and are still used in this way in many places of central and southern Italy, including Sicily and Sardinia. *Dead wood* and litter have been collected for centuries in the Downy oak woods. This with the millennial history of clear-cutting, burning and grazing may have significantly altered the soil formation processes and carbon accumulation.

Following the recent abandonment, many of the current Downy oak woods are developed on soils that had been cultivated for centuries (GUARINO, 2015). However in Italy there is a little patch of forest that has been candidate to old-growth forest of *Quercus pubescens* in habitat 91AA\* and is in Bosco del Fanuso in the Natural Reserve “*Bosco della Ficuzza, Rocca Busambra, Bosco del cappeliere e Gorgo del Drago*” Special Protected Area ITA020007 located in Contrada Fanuso, Godrano (PA) (BADALAMENTI *et alii*, 2017).

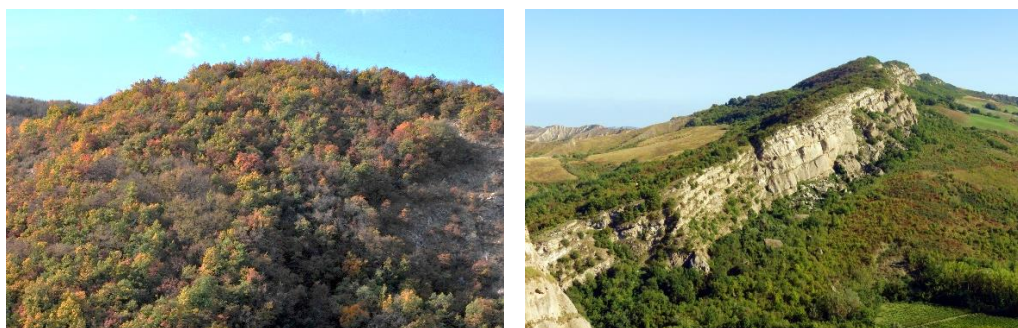


Figure 1. Bosco autunnale a Monte Mauro (photo by Max Costa)

Fig. 1. Pădure pe versanții Monte Mauro

## Methods

The conservation actions foreseen in the five project areas are the following: forest interventions to direct the structure of the forests towards a natural forest, protection against grazing of wild animals, suppression of exotic and invasive species, production and planting of seedlings species of habitat 91AA\*, *ex-situ* breeding and repopulation of some saproxylic insects, to favour trees, shrubs and herbaceous specific composition of habitat 91AA\*, to encourage un-even forest: diversification by age and tree size, vary the closure of the forest cover; to ensure a vertical diversity and a vertical density of the forest; to remove both shrub and arboreal alien species, such as *Pinus nigra* and other exotic species; to generate, maintain or open gaps large or small (up to a few hundred m<sup>2</sup>) controlling invasive species.

Release dead material on the ground and standing dead trees (snags and stumps) to improve micro-habitat and to encourage the spread of saproxylic insects, insectivorous birds and small rodents. Generate dying trees, ensuring a spatial distribution of various forms of dead and rotting wood. Keep large, old and decaying trees. The defence actions from over grazing of wild animals in the five projects areas consist in fencing some surface to ensure a better and effective regeneration of 91AA\* habitat species. Areas where invasive and exotic species will be eliminated and replaced by native species and will be

fenced off. The project areas are infected by invasive alien species like *Ailanthus altissima* and *Robina pseudoacacia*. However for these two species no particular interventions will be done in Italy, these species being very aggressive and with a great potential of diffusion. No chemical products will be used and no mechanical precautions will be taken. The restoration of habitat 91AA\* will be realized through a nursery production of herbaceous, arboreal and shrubby species of the habitat 91AA\* that will be realized in the botanical garden Giardino Officinale of Casola Valsenio (RA) and a collection of seeds will be stored in the Germoplasm Bank of the University della Tuscia, in Viterbo, Italy. The seedlings will be planted and fenced to ensure a better and effective regeneration of 91AA \* habitat species. The produced species will be used also for buffer zone at the edge of the forests (purchased land), as a protection from chemical agents of the surrounding crops. The breeding and repopulation of saproxylic insects such as Stag beetle (*Lucanus cervus*, classified as LC in the IUCN Red List), Great Capricorn beetle (*Cerambyx cerdo*, classified as LC in the IUCN Red List) and Hermit beetle (*Osmoderma eremita*, classified as NT in the IUCN Red List) will be carried on by Aquae Mundi NGO of Russi in the province of Ravenna. The three species are not extinct in the Gypsun Vein, but are rare. The intention is to collect some specimens in the Natural Park, reproduce them and repopulate the areas. For *Osmoderma eremita* results will be taken for LIFEeremita. The impact and effectivity of the conservation management actions are planned to be analysed with a monitoring protocol divided in three comprehensive modules:

A first module that covers the forests stands network survey (forest stand module) on the selected parts of the project areas. The network survey (500 points in Italy) is planned to be accomplished in a 40 x 40 m net. In all net points the survey of forest stand, shrub layer and deadwood will be carried out in a defined-sized circular plot. Following variables are intended to be measured in each circle: species diameter, social position and health status of the tree individuals; species and number of shrub layer individuals; diameter and length of lying deadwood. Circular plot survey amended by point relascope, light intensity and tree height measurements. The survey will be carried out before (baseline survey) and after the conservation management actions, and after the repeated conservation management actions.

The second module of the protocol focuses on the survey of certain selected conservation management actions. The monitoring primarily targets to survey the regeneration of tree and shrub species in selected artificial gaps, without the impact of large herbivores. Moreover, within the artificial gaps the decay phases of the created lying and standing dead wood and the regeneration of the artificially planted tree and shrub species saplings planned to be surveyed.

The third module is the zoological monitoring, covering the survey of Animal groups acknowledged as good indicators of forest stand structure. In Italy the zoological monitoring protocol will focus on Bats, saproxilycs insects, Carabidae and Arachnidae specimens and is intended to be joined with the management action module. (Project Handbook, 2017)

## Results

The expected results of Life4oak forests can be briefly summarized in the following lines:

- the natural oak forests condition is reconstructed as a standard for nature conservation management of oak forests;
- the ecological nature conservation oak forests management guideline elaborated and published with the result of its application by the project;
- 43.52 ha forests habitats in Hungary and 40 ha in Italy will be purchased;
- about 2,066 ha protected oak forests (1,555 ha in Hungary and 511 ha in Italy) managed according to the elaborated nature conservation management guideline in 24 project areas (19 in Hungary, 5 in Italy).

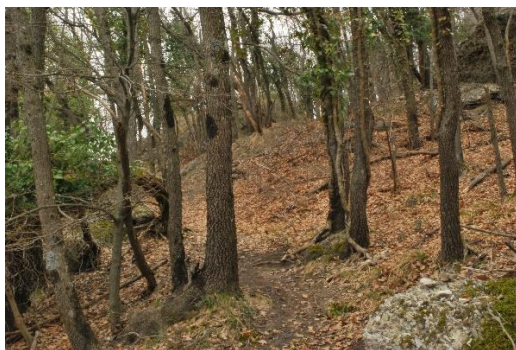


Figure 2. Downy oak forest on the southern slopes of Monte Mauro (photo by Max Costa)

*Fig. 2. Pădure de stejar pufos pe versanții sudici ai Monte Mauro*



As a result of this kind of management the forest structure will improved towards more natural one, lying and standing deadwood are present in all the areas. The biodiversity of the project areas are increased. About 95 ha forests fenced around to eliminate game's damage. The invasive tree species are eliminated, 50 ha in Hungary, 30 ha in Italy. Eleven presentations and field demonstrations held for stakeholders (working on concerned sites, forestry teachers and students).

Others results are: publishing of guidelines for the forest habitat development on the potential oak habitats (500 copies) and about ecosystem services in three languages (Hungarian, English and Italian); International conference organised to evaluate and share results and experience of the project; the general public's awareness raised towards the importance of Natura 2000 sites and nature conservation of oak forests by the project's webpage; 25 information signs; 5 minutes interactive movie; 300 copies of forest atlas; 500 copies and online materials for kids; information materials and regular media news. (Project Life4oakforests handbook, 2017)

### References

- Life4OakForests, 2017, *Life 16NAT/IT/000245 Handbook*: 1-272.
- BADALAMENTI, E., LA MANTIA, T., LA MANTIA, G., CAIRONE, A., LA MELA VECA, D.S., 2017, *Living and Dead Aboveground Biomass in Mediterranean Forests: Evidence of Old-Growth traits in a Quercus pubescens Willd. s.l. Stand. Forests*, **8**: 187. [www.mdpi.com/journal/forests](http://www.mdpi.com/journal/forests)
- GUARINO, R., BAZAN, G., PAURA, B., 2015, *Warm Temperate Deciduous Forests Around the Northern Hemisphere*, E. O. Box, K. Fujiwara, eds., Geobotany Studies, Springer International Publishing, Switzerland: 139-151.

**Serena PETRONCINI, Massimiliano COSTA**

*Authority for Parks Management and Biodiversity – Romagna,  
Via Aldo Moro 2, 48025, Riolo Terme (RA), Italy  
[serenaparco@gmail.com](mailto:serenaparco@gmail.com); [Massimiliano.costa@regione.emilia-romagna.it](mailto:Massimiliano.costa@regione.emilia-romagna.it)*