Natura 2000 Biogeographical Process – Mediterranean Region

Workshop on Mediterranean forest management and Natura 2000

Parc naturel régional du Luberon, Monday 9 – Wednesday 11 May 2016

Overview of contributions

Version 3 May 2016
1. Key note speech

Keeping biodiversity in Mediterranean forests through scales of space and time

Dr Jacques Blondel, Director of Research Emeritus at the Centre of Functional and Evolutionary Ecology (CNRS) in Montpellier, France

The current distribution and zonation of vegetation assemblages and their associated plant and animal communities in the Mediterranean realm are a legacy of a long history which starts from the beginning of the Neogene and culminates in the Pleistocene ice ages. This legacy will be briefly summarized as a starting point for demonstrating that the processes that guarantee the survival of all the species which evolved during this history (i.e. biodiversity) rely on a forest-specific regime of natural heterogeneity which is driven by disturbance events. The persistence in space and time of species and communities depends on the range of dispersal of organisms within meta-populations and meta-communities, which raises the question of the scale of dispersal relative to the distance between habitat patches within a forest mosaic. Of paramount importance within the forest matrix old stands with senescent and decaying trees are urgently required for the persistence of many species. Defining and describing wilderness (naturalité) needs considering forests as moving mosaics including many habitat types within which functional networks operate at appropriate scales of space and time. Examples of these processes will be given from observations and modelling in various forest types of the region.
2. Knowledge Market

**Conservation de Gites à Chiroptères - Animation Natura 2000**

**Ms Dominique Rombaut**, Syndicat Mixte du Pays de la Provence Verte, France

Conservation bat roosting in a bridge (*Myotis nattereri*) and in a building (*Rhinolophus hipposideros*) in two Natura 2000 sites in the South of France (Var).

**Forest Management Practices to Increase Multiple Ecosystem Services in Italian Coniferous Forests: SelPiBioLife and LIFE-FoResMit Projects.**

**Ph.D. Isabella De Meo**, Researcher, Council for Agricultural Research and Economics, Agrobiology and Pedology Centre (CREA-ABP), Italy

*SelPiBioLife (Innovative silvicultural treatments to enhance soil Biodiversity in artificial black Pine stands)* and *LIFE-FoResMit (Recovery of degraded coniferous Forests for environmental sustainability Restoration and climate change Mitigation)* are, respectively, a Biodiversity and a CCM (Climate Change Mitigation) projects. These two Italian projects are aimed at testing and verifying the effectiveness of management options on coniferous forests (in particular black pine stands of the Italian Apennine) to increase the functionality of various ecosystem services. The two projects are based on testing innovative silvicultural treatments (selective thinnings) based on the regulation of light penetration through the forest cover and the selection of more productive trees. These treatments firstly improve growth rates and stands stability. Furthermore, the application of innovative silvicultural practices is effective in increasing soil biodiversity and improving the ecological stability and climate change mitigation potential of the stands.

**LIFE AdaptFor ‘Adaptation of Forest Management to Climate Change in Greece’**

**Dr Petros Kakouros**, Biotope Wetland Centre (EKBY), Greece

As forests are already affected by climate change, it is important to begin developing and implementing adaptation strategies in order to enable the conservation of healthy, productive forests. In the framework of the EU LIFE+ AdaptFor project, the causes of the dieback of Scots pine and Greek fir, and the intrusion of conifers into broadleaves in four
selected Greek forest ecosystems were diagnosed and assessed. Guidelines for adapting the management of Greek forests to the changing climate were then drafted. The main challenge was to combine, within the forest management planning cycle, adaptation to climate change with forest biodiversity and wood-production aspects. Thus, mostly low-regret adaptation options were considered in order to reduce forest ecosystems’ vulnerability and enhance their resilience to climate change. These were finalised through consultation with the competent Forest Services and were subsequently incorporated into the Forest Management Plans of the four study areas.

**LIFE ForestLife: Building Cooperation, Developing Skills and Sharing Knowledge for Natura 2000 Forests for the Greek Forest Community**

**Dr Petros Kakouros**, Biotope Wetland Centre (EKBY), Greece

The main issues targeted by the LIFE ForestLife project are the difficulties of assessing and communicating new knowledge and experience on forest management, especially with regard to the management of Natura 2000 forest sites, and the lack of modern tools for communication and cooperation between the members of the Greek forest community. These issues were identified during the first meeting of the ongoing New Biogeographical Process held in Thessaloniki in 2014, along with obsolete governance procedures, reduced funding, etc. The project aims to support the exchange of knowledge and best practices and to develop the skills of forest managers and others working in forests within Natura 2000 sites in Greece. An Internet-based ‘Collaboration Platform for Forests’ (CPF) will play a key role during this process, together with a series of seminars and other capacity-building and dissemination actions.

**Management of Forest Stands in Italy to Enhance Ecosystem Biodiversity: the Project SelPiBioLIFE**

**Dr.ssa Anna Graziani**, Fellowship, Council for Agricultural Research and Economics - Agrobiology and Pedology Centre (CREA-ABP), Italy

SelpiBioLife (Innovative Silvicultural treatments to enhance soil Biodiversity in artificial black pine stands) is a LIFE project concerning biodiversity issues. Its main objective is to demonstrate the potentiality of an innovative silvicultural treatment to enhance the level of biodiversity in the soil of black pine stands. In particular, the project aims at evaluating the effects of a selective thinning compared to the traditional thinning (thinning from below to leave the highest quality well spaced trees) and to the absence of silvicultural treatments. In artificial black pine stands of Italian Apennine the selective thinning is not the usual silvicultural treatment applied. Nevertheless, improving both the vertical and
horizontal stand structural diversity, it modifies the canopy cover and enhances the rate of light, water and temperature at the soil level. The global effect of the treatment is the enhancement of the ecosystem functionality and the increase of the stand soil biodiversity.

Mediterranean Public Forests: How Much do They Contribute to the Connectivity of Natura 2000 Sites?

Ing. Begoña de le Fuente, Universidad Politecnica de Madrid

Forest management in Europe needs to contribute to the ecological connectivity between forest habitats and Natura 2000 sites. The role of public forests towards this end has been however rarely explored, particularly in Mediterranean landscapes. We here present a specific connectivity analysis to evaluate the contribution of public forests to connectivity between Natura 2000 sites in Spain, based on graph theory, habitat reachability metrics and landscape resistance surfaces for several Mediterranean woodland types. We found that public forests were part of the key functional connections in a much higher proportion than their actual availability in the landscape, i.e. they had a preferential role as part of the green infrastructure outside Natura 2000 forest sites. This finding is of considerable management importance and should stimulate the design and implementation of new management measures within and around public forests to conserve or restore the connectivity of functional landscape networks.

MEDFORVAL: Network of Forested Areas of High Ecological Value

Valentine Plessis, Communication assistant, AIFM, France

The MEDFORVAL network gather forested areas from all around the Mediterranean basin to exchange best practices and tools and develop common project proposals in order to manage, restore or conserve their High ecological value, as well as raise awareness among population, practitioners and decision makers of all sectors.

Old-growth Beech Forests at its Southwestern Border: Surviving Under a Harsh Mediterranean Environment

Dr Susana Cárcamo & Dr Oscar Schwendtner, Bioma Forestal, Spain

Introducing the beech forest remnants in the southwestern border for the species' worldwide distribution. These remnants are located in the Spanish Central System (between Madrid, Guadalajara and Segovia) surrounded by a fully Mediterranean
environment. We have measured some data on the structure of some of the old-growth stands. We discuss also about the past management history in the different properties. From all that, we infer some hypothesis on forest dynamics in this harsh environment in next years. We propose some conservation measures for these valuable forests.

Old-Growth Beech Forests in the Gran Sasso and Monti Della Laga National Park: Stand Structure and Ecological Characterization

Dr Daniele Di Santo, Parco Nazionale del Gran Sasso e Monti della Laga, Italy

Old growth forests are extremely rare in the Mediterranean region and are mostly located in areas designated for nature conservation, as well as National Parks. Reliable data on their spatial distribution and biodiversity are essential to promote old-growth networks and proper conservation strategies. This paper focuses on the operational procedure applied to identify and characterize old-growth forest stands in the Gran Sasso and Monti della Laga National Park (Central Italy), also 2000Natura site. According to the concept of “old-growthness”, the degree to which old-growth attributes are developed, we identified forest stands showing structural attributes associated with late successional stages. At first, two beech forest stands and one common ash forest stand were detected and mapped by high resolution multispectral imagery classification, supported by local historical records about forest management. Then, structure-based and taxon-based bioindicators (vascular plants, saproxilic beetles, epiphytic lichens) were collected by field survey to characterize and monitor old-growth conditions. Finally, in order to foster old-growth development also in forest stands of earlier successional stages, under similar site conditions, practical management guidelines were established.

Recovery of Degraded Coniferous Forests for Environmental Sustainability Restoration and Climate Change Mitigation – the LIFE-FoResMit project

Dr Alessandra Lagomarsino, Project Coordinator, Consiglio per la Ricerca in Agricoltura e l'analisi dell'economia agraria CREA-ABP Agrobiology and Pedology Research Centre (CREA-ABP), Italy

The LIFE-FoResMit project aims at testing and verifying the effectiveness of management options for the conversion of peri-urban degraded coniferous forests to restore ecological stability and climate change mitigation potential. Forest degradation implies a long-term loss of productivity, which thereby lower the capacity to supply products and/or services. Innovative silvicultural treatments based on the regulation of light penetration through
the forest cover and the selection of more productive trees will be applied in selected peri-urban forests in Italy and Greece. The project will provide data on vegetation structure, biomass increment, C accumulation in all relevant pools of vegetation and soil (above and belowground biomass, litter, dead wood and soil, IPCC 2003) and CO2 and other greenhouse gas (GHG) emissions, thus giving a complete picture of mitigation potential of management practices.

White-backed Woodpecker as a Bioindicator of Old-Growthness in the Pyrenean Beech Forests: a Tool to Preserve Biodiversity on Integrated Forest Management"

Dr Susana Cárcamo & Dr Oscar Schwendtner, Bioma Forestal, Spain

White-backed Woodpecker (Dendrocopos leucotos) reaches the southwestern limit of its global range in the Western Pyrenees (Navarra, Spain). Here inhabits the lilfordi subspecies which is considered under the “extinction risk” category by the Spanish Red List. The estimated current population in Spain is approximately only 100 – 130 couples, (98% of them in Navarra), living in mature beech forests.

Some of the 100 – 130 couples of the species in Spain are living on protected areas without timber extraction, but a relevant proportion live on the oldest stands in managed forests. In the comings years these stands are going to have a high probability of suffering intense cuttings (regeneration cuttings at the shelter wood system, usual in beech forest management in Spain).

Our study focused on Quinto Real, a 3500 ha beech forest located in the heart of the species’ range in Navarra. Quinto Real is managed under a timber extraction plan since 1903. It is also included in a Natura 2000 Special Area of Conservation (SAC) since 2005, and woodpeckers are considered as keystone species for conservation purposes in the SAC management plan. Probably it is the place in our country with more information about breeding population and habitat use of that species during the last 23 years (5 full censuses and 2 partial censuses, all of them conducted during breeding seasons between 1993 and 2016).

Throughout that period, the population of White-backed woodpecker (regarding number of breeding territories) has remained stable in the Quinto Real forest: around 13 pairs (0,37 couples/km2). There have been some cases of territory’s dropouts and some others of new colonizing, maintaining approximately the overall numbers. The population density doesn’t reach its optimum (1,5 couples/km2, more than 4 times, in best reference places), but it remains stable through the time.

We try to identify the structural characteristics of beech forest stands (key parameters and threshold values) on the species breeding territories and its relation with the forest
As a result, we get a clear correlation between territories occupation and some habitat conditions: half-closed canopy, existence of large trees (DBH > 45 cm) and enough volume of dead wood. These features reveal some similarity to maturity conditions (an advanced phase of the silvogenetical cycle) on beech forests. White-backed Woodpecker could be considered an indicator of good habitat quality and as other authors have highlighted (Roberge and Angelstam, 2004) an umbrella species for the protection of other organisms with the same habitat needs.

For these reasons we propose to improve the current silvicultural management with some good practices for the conservation of White-backed woodpecker and other inhabitants of mature beech forests in the way towards a true integrated forest management.
3. Break out group presentations

Theme 1: The state of scientific knowledge and knowledge gaps concerning ecological connectivity, in particular old-growth networks, in Mediterranean forests

Assessing the Relevance of the Natura 2000 Mediterranean Forest Habitats in the Iberian Peninsula

Dr Inês Marques Duarte, Centre for Applied Ecology "Prof. Baeta Neves" (CEABN), Portugal

The Natura 2000 network includes core breeding and resting sites for the most important rare and threatened species of flora and fauna, rating natural habitat types. In the Mediterranean region, forest ecosystems support high levels of biological diversity. Management approaches that promote sustainable forestry and nature conservation in these ecosystems are a matter of concern but an essential task to be dealt with. For some important and very rare habitats, priority status and risk of extinction are not related to the habitats’ rarity.

We used rarity values and representativeness of habitat areas in Europe to identify the most relevant Mediterranean forest habitats in the Iberian Peninsula, thus contributing to prioritising resource allocation and management measures. According to our approach, the Iberian Peninsula has several relevant habitats for conservation in Europe: types *9570, 9520, 92B0 and 91B0 showed the highest relevance index at Iberian level. Implications of these results are discussed.

Characterisation of Bat Activity in Downy Oak Forests

Emmanuel Cosson & David Sarrey, Groupe chiroptères de Provence-GCP, France

As part of the old forests research programme led by Luberon Regional Nature Park, the Groupe chiroptères de Provence (GCP) studied the relationship between Chiroptera and Downy oak stands.

Sixteen plots were sampled: eight ‘mature’ plots, with mature trees and strong indication of senescence / late stage /old stage, and eight ‘young’ plots with young trees and few indications of senescence. In each plot, habitat and micro-habitat surveys were carried out using a data record sheet developed from different protocols.
Subsequently, sampling was performed using an automatic recorder, once in spring and once in summer, during three nights.

The surveys showed that ‘mature’ plots have greater diversity and greater Bat activity.

Irregular management, the presence of micro-habitats, standing dead timber and the diversity of ligneous species are significant factors fostering Bat activity. Micro-habitats favouring nesting of Bats seem to favour activity of arboreal species, like the Barbastelle bat, the Pygmy pipistrelle, and the Long-eared bat.

Seniority / ancientness of the forest cover, whatever its maturity, seems to attract forest Bats.
Theme 2: Strategies for the implementation and monitoring of old-growth forest networks in the Mediterranean region

Unmanaged Forests Network in Cévennes National Park: A tool to Improve Naturalness of Managed Forests

Mathieu Baconnet, Parc national des Cévennes, France

Current forest cover in Cévennes National Park’s central zone is 60% (57 000 ha). The comparison of old and recent forest data shows that around 20% of current forests were already forested in the mid-19th century. These 12 000 ha are called ancient forests. Some species, most often fragile and with low dispersal ability, depend on ancientness and give ancient forests conservation value. The Cévennes National Park’s charter aims to strengthen forests’ naturalness and plans to develop an unmanaged forests network at different spatial scales. Ancient forests are part of the strategy of its implementation. In public forests, Cévennes National Park and the National Forestry Office work together to implement an efficient unmanaged forests network which is monitored with national protocols. In private forests, Cévennes National Park enables owners to consider conservation issues of their forests by giving appropriate recommendations.

Old-growth Forests in Spain: Some Examples of Networks at the International, National and Regional levels

Dr Oscar Schwendtnner, Bioma Forestal, Spain & Mr Jose Antonio Atauri, Europarc Spain

After several centuries under an intense human use, old-growthness characteristics are scarce in most of Spain forests. Only few remnants are really in the last phases of the sylvogenetic cycle, and some characteristics of Mediterranean forests (such as the role of fire) make it difficult to find undisturbed situations.

In the second half of last century, due to forest abandonment and less timber extraction, some opportunities in the way towards old-growthness have been brought. In the last years, some entities have developed initiatives to work around the concept of old-growth forests conservation:

1- At the international level

Since 2011 an European approach to get a net of old-growth beech forests through the different ecological conditions in Europe have been developed. As a result, at 2016 joint candidature of eleven countries (an extension to an existing Natural World Heritage Site) have been presented to UNESCO. Spain contributes with 3 candidates in different
mountain ranges: Cantabrian, Pyrenean and Central System, involving the southwesternmost limit for the species in the European continent. The concepts of Maturity, Integrity and Outstanding Universal Value have been highlighted for these sites.

2- At the national level

Since 2013 the forest conservation group of Europarc-Spain began yearly meetings to get a common definition for old-growth forests (bosques maduros) and old-growth stands (rodales viejos) in Spain and to find a way to work for the conservation of these scarce remnants. In 2015 the preliminary results of these discussions were published (Europarc-España, 2015, http://www.redeuroparc.org/img/Bosques/BOSQUES-MADUROSsintesis_vers-Final2.pdf), comprising a reference document with definitions and conceptual basis, and a set of indicators to evaluate old-growthness at a stand level. These indicators have been tested in several regions, allowing the identification of 25 stands in 10 forest types. From 2017 to 2019, support for developing a Network of Reference Forests will be provided by a new LIFE project. A meeting next October in Ordesa National Park will go forward in developing biodiversity oriented indicators.

3- At the regional level

As a result of the work at the regional level, Aragon Autonomous Community began in 2015 a prospection on 8 different forest habitats, which will be extended to 6 more in 2016. The goal is to select some reference stands and to get information about the main parameters that define old-growthness and its threshold values, focusing on the Mediterranean forests (formations of Pinus halepensis, Pinus pinaster, Juniperus thurifera, Quercus ilex...) and analyzing the dynamics driving to an old-growth status in these Bioregion. There are also other interesting initiatives at the regional level, for example the Catalonian Singular Forests Catalogue.

4- At the local level

Some searching of old-growth stands has also been made at the local level. One of them is the on-going process to locate the most interesting old-growth forests in the Montseny Natural Park (at Barcelona and Girona provinces). So, some Abies alba, Fagus sylvatica, Quercus ilex, Quercus petraea and Pinus sylvestris forests have been selected.
Theme 3: Forest management to preserve reservoirs of biodiversity and ancient woodlands

Forest Management to Preserve Biodiversity and Ancient Woodlands

Presented by: Marcello Miozzo (DREAM Italia) & Donato Salvatore La Mela Veca (Università di Palermo)

Contributing but not present: Gabriele Mugnai (Dream Italia), Sebastiano Cullotta (Università di Palermo), Federico Maetzke (Università di Palermo), Sebastiano Sferlazza (Università di Palermo), Luciano Saporito (Regione Siciliana)

ResilForMED project (www.resilformed.eu) started in 2013 and its planned activities will be completed in 2016. It has been implemented in Sicily with funds from the European Commission LIFE+ funding.

The project pursues the selection and promotion of best practices to improve the resilience of forest ecosystems. The best practices are selected through an in situ evaluation process based on a form reporting 12 criteria concerning compositional and structural types.

Project deliverables include a map of forests most prone to climate change, the development of forest planning processes based on participatory processes involving local communities, and the adoption of project results in regional policy and forest programmes.

Examples of Integrated Forest Management in Greece

Dr Petros Kakouros, Biotope Wetland Centre (EKBY), Greece

Forestlands in Greece account for more than 50% of its area. High forests cover more than 60% of the forestlands or of Greece (3 903 000 ha in 2010), while primitive forests with low human impact are estimated to less than 1% of these forested lands. All other Greek forests are secondary, established on former farmlands or used as rangelands. Reforestation accounts for a small proportion of Greek forestlands. As forest habitat types cover 43% of the terrestrial Greek SCIs, management of Greek forests is important for the conservation of Europe’s forest biodiversity. We will present three examples of integrated forest management. One from Prespa National Park where usual forest management, goat and sheep grazing and restoration measures are implemented in order to safeguard an ancient Juniperus excelsa forest, and two forest restoration projects: the first from the riparian forest of Nestos and the second from Parnonas in the
The project LIFE+ FAGUS (NAT/IT/135, www.fagus-life-project.eu) is testing forest management approaches in Apennine beech forests that are recognised as priority habitats due to the occurrence of yew and holly (habitat 9210*), and of Silver fir (habitat 9220*). The tested approaches aim at enhancing forest structural heterogeneity as a way to increase both the abundance of target tree species (yew, holly and Silver fir) and the diversity of focus taxa (vascular plants, epiphytic lichens, birds, fungi and beetles), while ensuring sustainable use of the forest for wood production. Silvicultural treatments have been implemented in six sites in two Italian National Parks. At the same time, monitoring activities focused on both forest structure and multi-taxon biodiversity are being carried out according to a Before-After-Control-Intervention approach.

The presentation will provide forestry and nature conservation practitioners with hands-on experiences in the design, implementation and monitoring of concrete conservation actions.