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LIFE Project Number

LIFE15 GIE/ES/000809

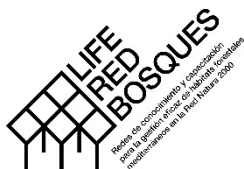
Final Report

Covering the project activities from 01/09/2016¹ to 30/04/2020

Reporting Date²

15/07/2020

**KNOWLEDGE AND TRAINING NETWORKS FOR THE EFFECTIVE MANAGEMENT OF
MEDITERRANEAN FOREST HABITATS IN NATURE 2000**



¹Project start date

²Include the reporting date as foreseen in part C2 of Annex II of the Grant Agreement

Project Data

Project location:	Spanish Mediterranean forest habitats of Nature 2000
Project start date:	<01/09/2016>
Project end date:	<31/10/2019> Extension date: <30/04/2020 >
Total budget:	590,154 €
EU contribution:	345,092 €
(%) of eligible costs:	60%

Beneficiary Data

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This table comprises an essential part of the report and should be filled in before submission

Package completeness and correctness check	
Obligatory elements	✓ or N/A
Technical report	
The correct latest template for the type of project (e.g. traditional) has been followed and all sections have been filled in, in English <i>In electronic version only</i>	✓
Index of deliverables with short description annexed, in English <i>In electronic version only</i>	✓
<u>Mid-term report</u> : Deliverables due in the reporting period (from project start) annexed <u>Final report</u> : Deliverables not already submitted with the MTR annexed including the Layman's report and after-LIFE plan Deliverables in language(s) other than English include a summary in English <i>In electronic version only</i>	✓
Financial report	
The reporting period in the financial report (consolidated financial statement and financial statement of each Individual Beneficiary) is the same as in the technical report with the exception of any terminated beneficiary for which the end period should be the date of the termination.	✓
Consolidated Financial Statement with all 5 forms duly filled in and signed and dated <i>On paper (signed and dated originals*) and in electronic version (pdfs of signed sheets + full Excel file)</i>	✓
Financial Statement(s) of the Coordinating Beneficiary, of each Associated Beneficiary and of each affiliate (if involved), with all forms duly filled in (signed and dated). The Financial Statement(s) of Beneficiaries with affiliate(s) include the total cost of each affiliate in 1 line per cost category. <i>In electronic version (pdfs of signed sheets + full Excel files) + in the case of the Final report the overall summary forms of each beneficiary on paper (signed and dated originals*)</i>	✓
Amounts, names and other data (e.g. bank account) are correct and consistent with the Grant Agreement / across the different forms (e.g. figures from the individual statements are the same as those reported in the consolidated statement)	✓
Mid-term report (for all projects except IPs): the threshold for the second pre-financing payment has been reached	N/A
Beneficiary's certificate for Durable Goods included (if required, i.e. beneficiaries claiming 100% cost for durable goods) <i>On paper (signed and dated originals*) and in electronic version (pdfs of signed sheets)</i>	N/A
Certificate on financial statements (if required, i.e. for beneficiaries with EU contribution ≥750,000 € in the budget) <i>On paper (signed original) and in electronic version (pdf)</i>	N/A
Other checks	
Additional information / clarifications and supporting documents requested in previous EASME letters (unless already submitted or not yet due) <i>In electronic version only</i>	N/A
This table, page 2 of the Mid-term / Final report, is completed - each tick box is filled in <i>In electronic version only</i>	✓

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2. LIST OF KEY-WORDS AND ABBREVIATIONS

FUNGOBE. Fundación Fernando González Bernáldez

FUNCAT: Fundació Catalunya-La Pedrera

GENCAT: Generalitat de Catalunya

CREAF. Centre de Recerca i Aplicacions Forestals de Catalunya

3. EXECUTIVE SUMMARY

Objectives

RedCapacita_2015 was established with the aim of enhancing the management of Spanish Mediterranean forests included in the Natura 2000 Network, providing the players involved with the best knowledge available.

Other more specific aims within this project are:

- To provide reference models for assessing the conservation status of Mediterranean forests.
- To provide tools and criteria for incorporating objectives such as the preservation of biodiversity and adaptation to climate change in forestry planning.
- To ensure the transfer of knowledge to all players involved in forest management.

The project was aimed at those public authorities responsible for forestry services, Natura 2000 and protected areas.

Project actions

For more than three years, the LIFE RedBosques project has worked on the interaction between managers of protected areas, forest managers and researchers, providing a platform in which to share knowledge and generate new tools through four main axes:

- 1) The debate and discussion for the incorporation of new scientific knowledge, through:
 - The creation and dynamization of a community of professionals both in the area of protected areas and forest management (Actions A1, B1)
 - The promotion of knowledge exchange through direct experience on the ground through a program of technical visits to different protected areas (Action B2)
 - Seminars that have allowed agreeing a set of criteria for forest management with conservation objectives (Actions B3, B4 and B5)
- 2) The identification and dissemination of good practices and successful experiences of forest management, and their enhancement, through:
 - Identification of good forest management practices, and making them available to the community through an online database (Action B4)
 - The application of pilot management plans and demonstrative silvicultural actions in the Parc Natural dels Ports, which have served to demonstrate in practice the feasibility of implementing the type of forest management proposed in the project (Action B6)
- 3) The development of practical tools and reference material that allow the application on the ground of the ideas and concepts developed in the project:
 - A protocol for identifying mature stands has been developed, based on the collection of indicators in the field (Action B3). The identified stands were incorporated into an online database (Action B7) where, after the analysis of the indicators, they can be included in a “network of reference stands”.
 - The scientific bases and the main recommendations for the management of forest maturity have been included in technical material designed for professional use: technical manuals and three videos (Action B9).

4) The transfer of knowledge generated in the project to the agents involved:

- Based on the results of the seminars, the pilot actions and the good practices identified, some classical training actions were developed, in the format of mixed online and face-to-face courses (Action B8 & D1).

All the actions proposed in the project were properly executed, in many cases exceeding the expected results and products, as reflected in the following sections. However, a 6-month extension was requested to guarantee the proper execution of actions B7 and B9. Because of the COVID-19, the final event (scheduled for April 2020), was cancelled.

Key deliverables and outputs

- A standardised methodology has been developed for the Identification and characterisation of old-growth stands.
- 160 stands with features of maturity have been identified, that correspond to 20 different forest habitats. Of these, 43 are defined as *stands of reference*.
- The online tool RedBosques (<http://redbosques.creaf.cat/redbosques/>) has been created, comprising a database of old-growth stands in Spain.
- Habitat management plans have been drafted for three private estates in Parc Natural dels Ports, comprising a total surface area of almost 900 ha.
- Silvicultural actions have been executed for conservation purposes and to boost maturity at several pilot sites, affecting 14 ha within these estates.
- Three visitor information panels on old-growth forests, installed at key points within three forest locations within the Natura 2000 Network.
- Three informative videos, freely accessible on Internet, on the value of old-growth forests and forest maturity management.
- An informative document: *Old-growth forests. Key questions for understanding them and better preserving them*.
- Manual: "Mediterranean Old-growth Forests: Characteristics and Management Criteria in Protected Area: the theory and practice proposed by RedBosques is summarized in this manual

Achievements

- 13 public Administrations have set up processes for the Identification and characterisation of old-growth stands following the RedBosques methodology.
- The planning projects for over 26,000 ha of woodlands in four autonomous regions have followed the criteria proposed by RedBosques.
- The '*Estrategia de Patrimonio Natural y Biodiversidad de Cataluña*' [Strategy for natural heritage and biodiversity in Catalonia] includes explicit references to LIFE RedBosques as the baseline for drafting a conservation policy for old-growth forests.
- The revised plans for five Natural Parks in the Basque Country include RedBosques proposals regarding the promotion and preservation of forest maturity in habitats of Community interest.
- Castilla-La Mancha has incorporated RedBosques methodology in its evaluation and monitoring system for the conservation status of forest habitats of Community interest.

- The Generalitat de Catalunya is funding new actions in monitoring the impact of exemplary actions performed by RedBosques in Parc Natural dels Ports. The municipalities adjacent to the park are developing planning mandates for their forests according to the principles put forward by RedBosques.
- The networking effort continues: RedBosques continues its work within EUROPARC-España woodlands.
- Contributions to the new European strategy for adaptation to climate change and to the new European Forest Strategy.

Main identified challenges

The main challenges in which it is necessary to continue working are:

- 1) Improve knowledge about the assessment of vulnerability to climate change of our forests.
- 2) Promote joint work between the teams responsible for the Natura 2000 Network and the teams responsible for forest management
- 3) Involve private owners: private property (either individual or collective) accounts for around 70% of the Spanish forest area
- 4) Mobilize sources of financing that are available in European funds, including forestry measures in rural development programs

4. INTRODUCTION

Environmental problem and objectives of the project

The management of forest habitats in the Spanish Mediterranean region is facing new challenges owing to social and economic changes over recent decades, such as the loss of traditional land uses and a new social perception of the role of forests. In this context, new management models are needed to accommodate these new social demands on forests, to include nature conservation and increasing forests' resilience to climate change.

LIFE RedCapacita_2015 was established with the aim of enhancing the management of Spanish Mediterranean forests included in the Natura 2000 Network, providing Natura 2000 managers involved with the best knowledge available. The long-term objective is to ensure that this knowledge is applied in their everyday tasks, incorporating aims such as the preservation of biodiversity and adaptation to climate change.

Other more specific objectives within this project are:

- To provide reference models for assessing the state of conservation of Mediterranean forests.
- To provide tools and criteria for incorporating aims such as the preservation of biodiversity and adaptation to climate change in forestry planning and silvicultural management.
- To ensure the transfer of knowledge to all players involved in forest management.

Stakeholders targeted

The management of forests protected within the Natura 2000 Network often falls to different teams within the Administration. It is essential that those responsible for the protection of protected areas and forestry management, should maintain excellent levels of coordination. All the above professionals are, therefore, the target audience for this project.

In addition, given that over 70% of protected forests in Spain are on privately-owned land, it is viewed as essential for these landowners to become involved in applying the results of the project. Similarly, these results may be incorporated into the daily practices of all those professionals involved in forestry management (consultants, conservationist bodies or research centres).

Project Impact Monitoring

In March 2017 a plan was drafted for monitoring the project's impact with the aim of assessing project efficiency on three thematic fronts:

- A) Better management of forest habitats of Community Interest (environmental problem).
- B) Training and awareness of the target audience.
- C) Transfer of project results to the target audience and to stakeholders.

Indicators have been identified for each of these thematic areas, and compiled for the duration of the project in order to produce a final evaluation of project impact. Two surveys have been conducted, one at the beginning to set the baseline and at the end of the project to evaluate impact on capacity building and awareness raising on the target audience.

Socio-Economic Context

It is estimated that over 15 million ha (forest cover in the Mediterranean autonomous regions) would benefit from the criteria developed in this project, which aim for better management leading to improved levels of conservation.

In particular, well preserved Mediterranean forests contribute to regulating water resources, mitigating the effects of natural disasters such as flooding, fire or drought, capturing carbon from

the atmosphere or enhancing pollination and thus agricultural production.

A synthesis of socioeconomic benefits of the management model proposed in the project have been made as one of the project results.

Communication Strategy

In December 2016 the Project Communication Plan was drafted with the following aims:

- To disseminate the milestones and main results of the project among its target audience, and to promote the latter's active participation.
- To transfer the project results to all stakeholders and to encourage their participation in project activities.
- To comply with the publicity requirements established by the LIFE Programme.

The plan covers different groups (target audience, stakeholders, the Europarc-Spain Assembly and the communication media) to whom the project's communications are directed, in each case proposing a strategy with details for key messages, communication channels and products.

International (European) target audience have been reached thanks to an agreement with the Europarc Federation for dissemination of project results, and an extensive effort in networking with other projects.

Expected longer-term results (as anticipated at the outset of the project)

1. To provide reference models for assessing the conservation status of Mediterranean forests.
 - A network of forests of reference, comprising at least 15 well-preserved forests (with a minimum of one forest of reference for each type of Mediterranean forest habitat), is set up online.
2. To promote the incorporation of aims such as the preservation of biodiversity and adaptation to climate change in forestry planning and silvicultural management.
 - Identification of at least 20 cases of best practices in forestry planning and management following conservation and adaptation criteria shared and published online.
 - Dissemination of a protocol for the design and implementation of silvicultural actions in Red Natura spaces, aimed at conservation and adaptation.
 - Drafting of management plans compliant with the results of the project for at least 5.000 ha
3. To ensure the transfer of knowledge to the target audience and stakeholders
 - At least 80% of the target audience gained better forestry management skills through Natura 2000
 - Greater target audience awareness of the importance of forestry management in Natura 2000 aimed at conservation and adaptation

5. ADMINISTRATIVE PART

Project management process

FUNGOBE, as coordinating beneficiary, undertook to direct, coordinate and manage the project from both the technical and the administrative and financial aspects. To develop the above tasks, the following working structure was set up (Annex E1.1 and E1.2):

- Technical Coordinator: responsible for designing and executing actions, drafting the schedule and monitoring the project's impact.
- Financial coordinator: responsible, among other functions, for drafting reports and the financial supervision of the project.
- Technical Team: team made up of project officers from the four project's partner entities (FUNGOBE, CREAM, Fundación Cataluña-La Pedrera and Generalitat de Catalunya).
- Management Committee: established on 25/10/2016, its main function was decision taking regarding the management and monitoring of the project.
- Advisory Committee: its main function was to provide technical support for the actions envisaged in the project. The Advisory Committee was made up of professionals from scientific fields and managers of protected natural spaces.

Working Method

Each quarter, the project coordinators provided the technical team with the working schedule to be conducted. The assigned tasks were monitored as follows:

- The FUNGOBE team held monthly coordination meetings.
- The technical coordinator assigned tasks to project partners, remaining in permanent contact.
- Partners took part in Advisory Committee and Management Committee meetings, and in ad hoc meetings to discuss specific project items.

Partnerships and their Added Value

- FUNGOBE added value: capacity for networking with protected area managers across Spain.
- Generalitat de Catalunya added value: facilitate contacts with forest landowners, and it is the competent authority to take action within the territory (Parc Natural dels Ports).
- CREAM added value: provides its research capacity in relation to Mediterranean forest habitats.
- Fundación Catalunya-La Pedrera added value: provision of a property on which to put into effect the project proposals.

Communication with the EASME and Monitoring team

Fluent communication was maintained with the assigned external monitoring team. The external monitor was consulted on several occasions throughout the project, to which a rapid solution was given, and has been informed of the progress made by the project.

The following monitoring visits have been held:

- 1st monitoring visit: February 15, 2017.

- Project launch day: February 16, 2017, was attended by the external monitor.
- 2nd monitoring visit: June 27, 2018.
- 3rd monitoring visit: the EASME desk officer was present, and took place on June 12. and 13, 2019, in the Parque Natural dels Ports (Tortosa, Tarragona).
- 4th monitoring visit (online): June 9, 2020 (final meeting).

Amendments to the Grant Agreement

On 07/05/2019 a 6-month extension was requested to guarantee the proper execution of actions B7 and B9. This extension was accepted by EASME, so the project execution period was extended until 04/30/2020. (See Annex E1.1).

6. TECHNICAL PART

6.1. TECHNICAL PROGRESS PER ACTION

A.1. PREPARATION OF A DIRECTORY OF CONTACTS AND ESTABLISHMENT OF REFERENCE GROUP

Foreseen start date: 10/2016 Actual start date: 10/2016
Foreseen end date: 12/2016 Actual (or anticipated) end date: 03/2017

Activities Completed

As established in the proposal, a directory has been compiled with the contact details of the target audience and stakeholders. This process was completed in three stages:

1. Identification of the managers of protected areas and forestry management technicians in the EUROPARC-Spain directory managed by the Foundation.
2. Identification of scientists and researchers related to the theme of this project.
3. Active online search to identify the representatives of forestry and conservation bodies, among others.
4. Permanently updating the directory as new contacts are added for project actions, such as mobility or seminars, or networking actions.

The directory is managed primarily by means of a database custodied by the Foundation. On the basis of the directory, and at the request of interested parties, a reference group has been established. The reference group is made up of target audience contacts who have shown an active interest in taking part in the project actions and in drafting or debating the documents generated therefrom. The activity conducted by this group is developed in action B1.

During the project lifespan, a directory has been compiled with a far greater number of contacts than initially envisaged, which multiplies the scope of this project's results and its capacity to influence the targeted professionals. The geographical representativity of this set of contacts covers all Spanish autonomous regions as shown in Table 1.

Table 1. Number of contacts per autonomous region included in the directory

REGION	Nº
Comunidad de Madrid	344
Andalucía	244
Castilla y León	206
Cataluña	199
Canarias	110
Aragón	90
Castilla-La Mancha	83
Comunidad Valenciana	81
País Vasco	65
Baleares	50
Galicia	45
Murcia	44
Cantabria	40
Asturias	35
Navarra	30
Extremadura	25
La Rioja	12

Ceuta	1
Other countries	22

Of the total compilation, 1.168 contacts correspond to the target audience, made up of protected area managers and forestry managers both within the Administration and associated public services.

Broken down by job title, the target audience shows a high proportion of contacts with medium or high decision taking responsibility (heads of unit or section), and over 150 directors of protected spaces (mostly in National Parks and Natural Parks), with broad powers for implementing the forestry management criteria proposed in this project in the territories in which they are competent.

Table 2. Target audience classified by job title

TARGET AUDIENCE	1168
Heads of Unit and/or Section	306
ENP Directors-Conservation Managers	151
Public Administration Technicians	690
Technicians in Public Companies	21

Stakeholders account for 534 contacts including many environmental NGOs, researchers and consultants. Forest landowners and their representatives, likewise, are a prominent group in this directory.

Table 3. Stakeholders classified by type

STAKEHOLDERS	534
NGO	209
University/Research	198
Companies	60
Landowners/Forestry associations	48
Other	43

The Reference Group comprises Target Audience contacts who have expressly requested being included plus a number of contacts added by invitation, owing to their relevance to the project subject matter. Geographical representativeness is complete, especially considering the Mediterranean Bio-geographical region which is the object of the project.

Table 4. Number of contacts per autonomous region included in the reference group

AUTONOMOUS REGION	Nº
Andalusia	23
Catalonia	20
Community of Madrid	15
Castilla y León	11
Community of Valencia	14
Aragon	10
Castilla-La Mancha	9
Basque Country	7
Navarre	7
Balearic Isles	3

Murcia	3
Extremadura	2
Asturias	1
Canary Islands	1

Results

Expected result: R1. Availability of a directory comprising 500 contacts.

Result achieved: the directory currently contains 1,726 contacts.

Expected result R2. Reference group (working group) formed by 125 members

Result achieved: Reference group is composed by 123 active members.

Modifications performed

It was decided to extend the deadline for completing this action (the proposed date was December 2016 and the action was completed in March 2017) in order to compile a directory with the maximum number of contacts.

Future Perspectives

Although this action was concluded 03/2017, the directory and the reference group continued to be updated and enlarged as contact is established with new stakeholders, especially through project actions such as B2 (mobilities) and B4, B5 (seminars) and through any networking actions performed.

B1. TECHNICAL DISCUSSION FORUM

Foreseen start date: 02/2017 Actual start date: 02/2017
Foreseen end date: 12/2016 Actual (or anticipated) end date: 04/2020

Activities completed

To promote the active exchange of information throughout the Reference Group (action A1) an e-mail distribution list has been drawn up. This distribution list is hosted on RedIris, the platform provided by the Ministry of Industry, Energy and Tourism for distribution lists of a scientific nature.

The name of this list is RedBosques and registration is required (authorised by the Foundation) to send an e-mail message to the list at: REDBOSQUES@LISTSERV.REDIRIS.ES

To access the distribution list go to:

<http://www.rediris.es/list/info/redbosques.html>



Figure 1. Screenshot showing the distribution list RedBosques on RedIRIS.

Currently 127 subscribers, identified in the reference group (Action A1), have participated in the Forum. All previous messages posted on the forum may be consulted online by subscribers using their password:

<https://listserv.rediris.es/cgi-bin/wa?A0=REDBOSQUES>

The Foundation is the list administrator. This task consists of authorising the publication of incoming messages, rejecting those unrelated to the project theme or classed as spam. The forum is not moderated, to the extent that message content is not judged.

In addition, the Foundation encourages the use of the forum by using the distribution list to circulate documents under debate, to announce project actions such as seminars or field trips, to share events or documents of interest from third parties, and to launch debates or items for discussion within the project objectives.

Results

Expected result: R3. A forum is generated with 125 technicians at the conclusion of the project, with a traffic rate of 5 messages / month.

Achieved result: the number of subscribers had reached 127. The Forum has handled a total of 129 messages, amounting to an average of 3 messages/month.

The e-mail distribution list has proved to be a highly efficient tool for exchanging information within a large group owing to its user friendliness (e-mail) and rapid response.

During the project lifespan the forum was actively encouraged for exchanging project results and events, other relevant events and eliciting participation in several technical documents. Main debates and interchanges referred to the debate on old-growth forests in the context of Action B3, specially for the “frequently asked questions” that were launched on the forum, and criteria for silviculture in protected areas (Actions B5, B9).

Future perspectives

The distribution list is viewed as a long-term forum for debate on technical issues of interest in the field of forestry management in protected spaces. An agreement between the Foundation and RedIRIS will enable its long-term presence, as hosting the distribution list is cost-free for the Foundation.



Figure 2. Screenshot showing the first messages in the distribution list

B2. MOBILITY PROGRAM FOR TECHNICAL STAFF TO VISIT DEMONSTRATIVE ACTIONS.

Foreseen start date: 04/2017 Actual start date: 02/2017
Foreseen end date: 06/2019 Actual (or anticipated) end date: 06/2018

Activities Completed

In the period between September 2016 and June 2018 four mobilities have been conducted:

1) Parque Natural de Grazalema and Parque Natural de Alcornocales (Cádiz).

On 10-12 May 2017 the first field trip in the LIFE RedBosques Project was conducted. On this occasion, a group of 11 forest managers and technicians in protected spaces in various regional administrations (Galicia, Castilla-La Mancha, Castilla y León, Community of Valencia, Cabildo de Tenerife, Aragon and Junta de Andalucía) shared experiences with environmental technicians and agents from Sierra de Grazalema and Alcornocales Natural Parks.



Photo 1. Participants on the visit to Grazalema Natural Park

2) Monte de Valsaín / Parque Nacional Sierra de Guadarrama (Segovia).

The second field trip for forestry and protected spaces technicians took place on 20-23 June 2017, within the framework of LIFE RedBosques. On this visit, participants were guided into the Monte de Valsaín forest, in the Sierra de Guadarrama National Park. For four intensive days a group of 10 technicians from several Spanish regional administrations (Diputación de Girona, Generalitat Valenciana, Ayuntamiento de Valencia, Junta de Andalucía, Castilla-La Mancha and Aragón) were able to experience at first-hand the forestry management techniques applied within this space that are compatible with conservation criteria deriving from its Natura 2000 and National Park status.

3) Sierra de Santo Domingo and Sierra y Cañones de Guara (from 24th to 26th April 2018).

This edition involved 17 park and forest managers from several autonomous communities (Andalusia, Aragon, Castilla y Leon, Castilla - La Mancha, Catalonia, Valencia, Galicia and Madrid). Within the framework of the activity, participants were able to learn first-hand about different experiences of forest management in the Sierra de Santo Domingo Protected Landscape, in the province of Zaragoza, and in the Natural Park of the Sierra and Canyons of Guara, in the province of Huesca.

4) Montseny Natural Park and protected areas of Girona (from 11th to 14th June 2018).

19 managers from Catalonia, Castilla - La Mancha, Castilla y León, Cantabria, Valencia, Galicia, Community of Madrid, Murcia and the Basque Country, visited different experiences in Montseny Natural Park and Biosphere Reserve and other natural areas of Girona, such as Alta Garrotxa, guided by the local managers.



Photo 2. Participants in the field trip to Monte de Valsain

During each visit, the Foundation was responsible for the following tasks:

1. To identify and select candidates for the field trips through the project network of contacts at the competent Administrations.
2. To design the field trip programme and activities, liaising with the hosts.
3. To draft and disseminate the programme by personal e-mail to all target audience contacts.
4. To convene the activity and conduct screening of participants. The selection criteria were suitability of the professional profile to the field trip aims and territorial representativity.
5. Coordination and logistics (transfers, board and lodging for participants).
6. Accompaniment by two agents of the Fundación to give assistance regarding the content in the exchange and regarding logistics and organisation matters.
7. To collect participants' activity summary and assessment sheets.
8. Dissemination of results (Newsletter, website and RRSS; see Action D1).

The following are provided at Annex B2.1 for the four field trips:

1. Letter of commitment from the host entity.
2. Programme for each field trip.
3. List of attendees.
4. Summary of participants' activities.
5. Photo gallery.

Results

Expected result: R4. At least 20 technical staff enhanced their skills by joining the field trips.

Achieved result: A total of **57** forest and protected area managers (target audience) have participated in the four field trips carried out during the project.

The field trips yielded positive results, as shown in participants' assessments provided at **Annex B2**. In these, the novel approach used and its applicability to participants' own management requirements are highlighted.

In addition to their direct effects, field trips have considerable indirect effects on promoting the replication of project actions. Thus, participation in field trips has favoured the replication of action B3 (scenarios of reference), as the trips give rise to processes for identifying stands of reference in several new territories (i.e. Comunidad Valenciana).

B.3. DEFINITION OF REFERENCE SCENARIOS FOR THE MANAGEMENT OF MEDITERRANEAN FORESTS

Foreseen start date: 03/2017 Actual start date: 03/2017
Foreseen end date: 12/2017 Actual (or anticipated) end date: 03/2018

Activities completed

B.3.1. Draft Working Document

During the first months of this action a working document was drafted to explain the value of old-growth forests and their importance as stands of reference to evaluate the conservation status of forest habitats of Community interest. This document, based on a comprehensive bibliography and the numerous contributions by the technicians involved in the project, was shared on the Reference Group forum for debate and uploaded on the project website:

The document was translated to English and Basque. The Basque version was financed by Gobierno Vasco.

All Pdf files are available in Annex 3.1. and on the website:

http://redbosques.eu/Documentacion_tecnica

B.3.2. Scientific-Technical Seminar

On 22-24 November at Parc Natural dels Ports (Tarragona), a meeting was attended by 37 forestry managers and directors of Spanish protected spaces, representatives of national, regional and local administrations, and private landowners, with the aim of sharing and debating the advances made in the identification and management of old-growth forest stands in the context of the LIFE RedBosques Project.

The seminar was held with the support of Generalitat de Catalunya. The Fundación was responsible for coordination and logistic issues, defining the program, facilitation of the sessions and dissemination of results. The tasks performed by CREAM in this section were focused on drafting technical documents and providing support to the seminar.

For the duration of the seminar participants shared their progress in the process of identifying stands and their experience as managers of this type of ecosystems. In addition, a visit was conducted to the project pilot sites at which, in turn, further forestry management plans are in progress that are expected to lead to the improvement of these habitats (Action B6). During this visit, the approach and aims established in forestry management plans and the suitability of potential management actions to reach such aims were debated with the attendees.

The seminar enabled the establishment of a two-stage procedure for selecting stands: in the first, a qualitative appraisal is conducted and in the second, a description is given using quantitative indicators, thus developing the criteria for managing old-growth stands or stands of reference.

As forecasted in the proposal, the transfer of results was maximised thanks to the participation of scientists from CREAM, Technology and Forestry Centre of Catalunya and Forestry Training and Research Centre of Cazorla (Junta de Andalucía) (see list of attendees at Annex B3.2)

The call for participants was disseminated on the Platform of the European Commission Bio-geographical Process, through which several applications were received. From these, Sophie Bourlon of Parc Regional du Luberon (France) was selected but cancelled at the last minute for personal reasons. Among the attendees was one member of the Europarc Federation (Teresa Pastor).

A space at the seminar was dedicated to forest landowners, three of which were invited as speakers:

- The Town Council of Beceite (Teruel) as a non-timber harvesting forest landowner, represented by the Mayor,
- One conservation body: Fundació Catalunya, represented by Miquel Rafa,
- One private owner: an invitation was extended to Jordi Canut, forest landowner within the National Park of Aigüestortes, engaged in photography activities on his property, but was declined for reasons of health.

Furthermore, representatives of the Centre de la Propietat Forestal de Catalunya [Forest Estate Centre of Catalonia] and the City Council of Tortosa took part in the subsequent debate.

The following information is provided at Annex B3.2: Seminar programme, List of participants, Conclusions of the seminar, Photo gallery.

Full information on the seminar (with participants presentations) is available on the project website: http://www.redbosques.eu/B3_seminarioElsports



Photo 3. Participants at the seminar at Parc Natural dels Ports.

B.3.3. Drafting the Implementation of the Forest Network of Reference Protocol

In this action, a procedure is proposed for identifying forest stands that are fully mature or will be in the near future, and may serve as a reference for evaluating the conservation status of the various types of forest habitat present in Spain:

- STAGE 1 – Prospection: It requires a short description, with qualitative or semiquantitative indicators, that may be easily fulfilled by trained personnel. It may be executed by forest specialists and rangers in a first approach to identify candidate forests.
- STAGE 2 – Characterization: Quantitative indicators about the forest's structural properties and human impacts is proposed to characterize each candidate forest stand. This work involves taking measurements on the field. Two alternative methods, based on sampling plots or transects, are proposed.

Technical documents relating to this sub-action protocols are available on the website and may be found in Annex B3.3 and in the project website:

<http://redbosques.eu/b3-identifying-reference-forests>

B.3.4. Implementation and Dissemination of the Forest Network of Reference

Many networking and active dissemination initiatives have been conducted, through presentations at conferences and seminars, relations with other LIFE projects and visits to public administrations that are members of EUOPARC Spain, seeking their direct involvement in this project (see Action D1).

As a result of the full range of actions conducted under this project (its presentation, its presence on the web, networking actions), it has been possible to foster the identification process for stands of reference. In every case, this process being the initiative of the competent administration which, with its own resources, has developed the activity using the methods proposed in the project. Following this process, 169 stands have been identified to date in Aragon, Catalonia, Castilla-La Mancha, Murcia, Comunidad Valenciana and Castilla y León, Andalucía, País Vasco, Navarra, Galicia and Barcelona, Girona and Alava, and 43 of them selected as Reference Stands.

During the first stage of the project stands which were selected as candidates for the Network of Stands of Reference, were published for dissemination on a google-based project website: <http://www.redbosques.eu/red-rodales-referencia>(figure 3).

This site has been replaced by the specific tool developed in Action B7.



Figure 3. Map showing the first version of the network of Stands of Reference

Results

Expected result: R5. A protocol is generated for the implementation of the Network of Stands of Reference.

Achieved result: a protocol has been generated consisting of two phases (described above). Technical manuals and field forms available online. (Annex 3.3)

Expected result: R6. Candidate forests to form part of the network of reference are identified.

Achieved result: to date, 169 stands have been identified as suitable candidates to form part of the network of reference stands.

Expected result: R7. A network of reference stands is created (15 stands selected, one for each forest habitat type with relevant presence in the Mediterranean Region).

Achieved result: the forest of reference stands is running (43 reference stands selected up to date).

Deliverables

Draft of deliverable B3 “Protocol for implementation of reference stands” is provided in Annex B3.3

Other results

A document with a compilation of the question most commonly asked regarding forest maturity has been developed too (“Mature forest. Frequently asked questions”). Most conflictive or recurrent issues about old growth forests identified by the project team were written as questions in the Technical Discussion Forum (Action B2) and the debates summarized in the document. The final document is available in Spanish, Basque and English in the project website (Annex 3.4).

The Basque version was financed by Gobierno Vasco.

Future perspectives

The identification of mature forest stands is carried by the regional authorities or park managers, with their own resources. The project actions have boosted the process of prospection and identification of mature forests in many places. The process of old-growth stands identification has ended in some cases (Aragon, Diputació de Girona, Catalunya, Castilla-La Mancha) and is underway in several administrations (Community of Valencia, Castilla y León, País Vasco). Stands have also been identified in several protected spaces in the rest of autonomous communities (Sierra de Guadarrama, Els Ports, Alt Pirineu, Montseny, Poblet, Sierra del Carche, Los Alconocales, Sierra de Grazalema, Sierra Nevada, Sierra de las Nieves, Picos de Europa).

It is intended to continue the process of prospection and identification of old growth stands in order to complete the network at a national level.

B.4. IDENTIFICATION OF BEST PRACTICES IN FORESTRY MANAGEMENT FOR CONSERVATION AND ADAPTATION TO CLIMATE CHANGE

Foreseen start date:	01/2018	Actual start date:	01/2018
Foreseen end date:	12/2016	Actual (or anticipated) end date:	
Foreseen start date:	03/2018	Actual start date:	04/2018
Foreseen end date:	12/2018	Actual (or anticipated) end date:	12/2018

Activities completed

B4.1. Gathering of best practices for forest management with conservation and climate change adaptation objectives

As a result of the call promoted by LIFE RedBosques, 27 experiences and best practices of forestry management practices with conservation objectives (habitats and species), or climate change adaptation objectives, have been compiled.

An standardized form was developed to collecting information in a comparable way (Annex B4.1)

B4.2. Technical seminar

From November 5th to November 7th more than forty managers of Spanish forests and protected areas, representatives of national, regional and local administrations, together with invited researchers, met in Atienza (Guadalajara).

The objectives of the seminar were to share the advances in the identification best practices, and to discuss the different options for managing forest habitats under conservation and adaptation to climate change criteria. The seminar was based on study cases contributed by the participants.

The seminar was held with the support of Junta de Castilla-La Mancha. The Fundación was responsible for coordination an logistic issues, definifn the program, facilitation of the sessions and dissemination of results. The tasks performed by CREAM in this section were focused on drafting technical documents.

The transfer of scientific knowledge was promoted thanks to the participation as invited speakers of researchers from CREAM, the University of Valladolid and the Autonomous University of Madrid. During the seminar, information about the network of reference stands in every region was updated, and preliminary guidelines for forest management in old-growth stands were discussed and agreed.

During the seminar, a technical visit was also made to an old-growth beech forest and various management actions in the Sierra Norte de Guadalajara Natural Park.

The following information is provided at Annex B4.2: Seminar programme, List of participants, Conclusions of the seminar, Photo gallery.

Full information on the seminar (with participants presentations) is available on the project website:

<http://www.redbosques.eu/transferencia-conocimiento/seminarios/seminarioatienza>

B4.3 Development and dissemination of the database

The database draft form was shared during the seminar for discussion. The good practices collected are stored in an open online database, accessible at:

http://www.wikiconservacion.org/wiki/index.php/Buenas_pr%C3%A1cticas_de_gesti%C3%B3n_forestal

and spread by technical forum and project communication platforms.

The database has been used to identify good practices that fed actions B5 and B9 (some of the identified actions were selected as demonstration cases for the Manual).

The publication of the database was disseminated through the web, the newsletter and social networks (Action D1)

Results

Expected result: R8. At least 20 best practices cases are identified.

Result achieved: 27 best practices cases have been identified and online.

Deliverables

The database is available on line:

http://www.wikiconservacion.org/wiki/index.php/Buenas_pr%C3%A1cticas_de_gesti%C3%B3n_forestal

Future perspectives

The database will be managed and maintained by FUNGOBE and its successive updates are announced on the different communication channels.

The EUROPARC Spain Congress (next in 2021) has proved to be a useful mean to periodically collect new good practices and update the database.

B.5. CRITERIA FOR THE DESIGN AND IMPLEMENTATION OF FOREST MANAGEMENT IN THE MEDITERRANEAN FORESTS WITHIN NATURA 2000 NETWORK

Foreseen start date: 10/2016 Actual start date: 11/2018
Foreseen end date: 12/2016 Actual (or anticipated) end date: 10/2019

B5.1 Elaboration of a draft document

As a first stage, a first document was drafted and distributed in the reference group and uploaded to the project web. It was a synthesis of the main guidelines which may lead forestry with biodiversity and adaptation objectives in protected areas.

This document was used as a starting point to foster debate and collect ideas and suggestions for the final document.

Draft document may be found on Annex B5.1

B5.2 Technical Workshop

The seminar was held on May 20-22 in Teruel, bringing together more than forty managers of Spanish forests and protected areas, representatives of state, regional and local administrations.

The seminar was held with the support of Gobierno de Aragón. The Fundación was responsible for coordination and logistic issues, defining the program, facilitation of the sessions and dissemination of results. The tasks performed by CREA in this section were focused on drafting technical documents.

The objective of the seminar was to agree on a debate on possible criteria for managing forest habitats under criteria of conservation and adaptation to climate change in protected areas, especially actions to improve maturity. Due to the objective of this seminar, most of the audience was made up of forest managers with extensive experience in forestry.

During the seminar, a technical visit was made to various mature stands and management actions in the Pinares de Rodeno Protected Landscape (Teruel)

The following information is provided at Annex B5.2: Seminar programme, List of participants, Conclusions of the seminar, Photo gallery.

Full information on the seminar (with participants presentations) is available on the project website:

<http://www.redbosques.eu/transferencia-conocimiento/seminarios/seminarioteruel>

B5.3 Elaboration of a document of reference

The contributions received to the draft document (B5.1) and the results of the seminar discussions (B5.2) were collected and incorporated into a reference document (Annex B5.3). This document was distributed in the reference group and made accessible online on the Project website.

This document would later be debated and completed to give rise to the technical manual of the project (Action B9)

Results

Expected result: R9. A protocol is generated for the design and implementation of silvicultural actions with conservation and adaptation objectives, in forests of the Red Natura

Result achieved: protocol developed (Annex 5.3)

B.6. APPLICATION OF CONSERVATION OBJECTIVES IN FOREST HABITATS OF COMMUNITY INTEREST IN THE NATURA 2000 NETWORK (DEMONSTRATION ACTIONS)

Foreseen start date: 01/2017 Actual start date: 11/2016
 Foreseen end date: 06/2019 Actual (or anticipated) end date: 06/2019

Activities completed

B6.1. Development of management plans

The first step of this action consisted of preparing the management plans for three private estates in the Natural Park of Ports. GenCat was the partner responsible of the action in “Clots Vall Figuera” and “Millers” estates, and FunCat in the case of the “Port d’Arnes Reserve” (Annex B6).

The aim of this action is to conduct three pilot management plans, as forecast: three Management Plans for Habitats of Community interest (PGHIC) on three estates within Parque Natural dels Ports (ZEC ES5140011), of which two are privately owned and a third is the property of Fundació Catalunya La Pedrera.

The works were supervised by LIFE Project technicians of the Fundació Catalunya and the Generalitat de Catalunya, and its execution has been contracted to two consultant companies. A summary of this action is shown in Table below.

Table 5. Summary of the Pilot Management Plans.

Estate	Landowner	Surface area	Contractor	Date of contract award	Completion date
Millers	xxx	208 ha	Bioma Forestal	20/09/2017	20/03/2018
Clots-Vall Figuera	xxx	224 ha	Bioma Forestal	20/09/2017	20/03/2018
Reserva dels Ports d’Arnes	FunCat	569 ha	ECAFIR SL	01/07/2017	20/03/2018

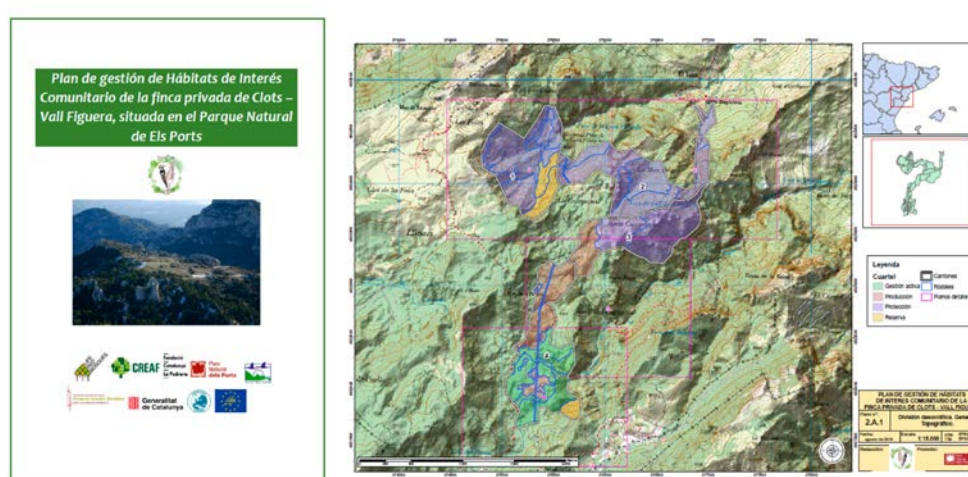


Figura 4. Plan de Gestión de la finca “Clots Vall-Figuera”

B6.2 Maintenance of open space habitats and B6.3. Recovery or improvement of forest maturity conditions

Once the management plans of three pilot estates in the Parc Natural dels Ports were drawn up, plans for implementing Actions 6.3 and 6.4 were developed (Annex B6). These actions are aimed at the recovery of open habitats and promotion of old-growth attributes in stands of *Pinus nigra* and *Pinus sylvestris* were developed in these estates.

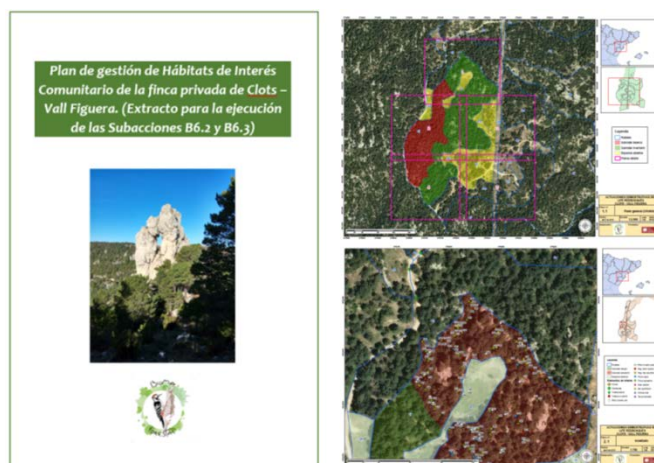


Figure 5. Planning document for implementation of Actions B6.2 and B6.3 in Clots-Val Figuera estate.

Since the two types of management activities (recovery and promotion of maturity) are carried out in all the three estates, the projects of both activities were drafted jointly for each estate, including actions B6.2 and B6.3. Below is a summary of surface covered by each activity.

Table 6. Summary of pilot actions

Estate	Surface covered by the management plan (B6.1)	Surface covered by the management activities (B6.2/6.3)
Clots – Vall Figuera	242,48 ha	4,79 ha
Millers	208,12 ha	3,20 h
Reserva del Port d'Arnes	426,77 ha	5,89 ha
Total	877,37 ha	13,88 ha

- Sub-action B6.2: Consisted in thinning in a sparse forest. The objective of the action was to open the canopy, so that the persistence of a herbaceous layer suitable for wild herbivores and the development of threatened flora could be allowed.
- Sub-action B6.3: A conservation forestry model of ecological processes that imitates the natural dynamics of ecosystems has been applied, in order to achieve forest structures typical of old-growth stands.

B6.4 Evaluation of the effect of the forestry management activities

A monitoring design in sampling plots has been developed by CREA. It has been implemented prior to the execution of subactions B6.2 and B6.3, and after the implementation. Sampling will be repeated in 2, 5 and 10 years after the end of the project.

- *Evaluation of the effect of the actions for the maintenance and recovery of open spaces (action B6.2) and of silvicultural actions to improve maturity (action B6.3).* During the months of May and June 2018 the first planned sampling campaign was carried out (before the interventions). For the follow-up of action B6.2, 6 plots were sampled (3 in the Clots-Vall Figuera estate and 3 in the Millers estate). In these square plots of 2x2 meters the coverage of each present species was measured to evaluate changes in biodiversity through both the Shannon index and confirmed presence of *Centaurea podospermifolia* (protected and rare species).
- *Follow-up of action B6.3 (improvement of maturity).* Previous sampling has been carried out in 45 plots in the three estates (15 plots x 3 estates). Prior to the sampling, cabinet work was done in order to identify and locate the conservation elements on the map. Sampling consisted of measuring live and dead trees, regeneration, covering of different strata of vegetation and detection of *Pyrola chlorantha* (protected and rare species).

Results

Expected result: R10. Management planning is completed for 900 ha of forests

Achieved result: Management plans already completed for 877,37 ha of forests

Expected result: R11. Maintenance and restoration of HIC related to open spaces (7 ha)

Achieved result: Management actions completed for 9,43 ha

Expected result: R12. Recovery or improvement of forestry habitats maturity conditions (4,5 ha)

Achieved result: Management actions completed for 3,4 ha

Expected result: R13. Summary report on the effect of management activities (treatments) on the state of conservation

Achieved result: Baseline report (situation before silvicultural treatments).

Future perspectives

Final versions of management plans have been submitted to the competent authority (Centre de la Propietat Forestal de Catalunya) for formal approval.

As a direct consequence of the implementation of Action B6:

1) The City Hall of Tortosa (the municipality adjacent to the park) has conducted management projects on two forest areas of its property, according to the same criteria, and in coordination with technicians of Parc Natural dels Ports. (monte de Mola de Catí y Monte del Regatxol). This is an additional action (not foreseen in the project) that involves planning according to the RedBosques methodology in 1,001 ha. The plans were finished in March 2020 and are currently in the approval process by administration (Centre de la Propietat Forestal). These estates are:

- Forest catalogued as Public Utility number 23 in Tarragona.
Name: Regatxol
Surface area: 590,2 ha
Landowner: City Hall of Tortosa

- Forest area catalogued as Public Utility number 24 in Tarragona
Name: Mola de Catí
Surface area: 411,6 ha
Landowner: City Hall of Tortosa

2) The owners of the Clots-Vall Figuera estate have started the procedures to carry out another of the actions planned in the Management Plan on an area of 7 ha. To do so, they have prepared a specific report that is pending approval by Centre de la Propietat Forestal.

B.7. TOOL FOR ASSESSING AND MONITORING REFERENCE FORESTS.

Foreseen start date: 12/2016 Actual start date: 03/2017
Foreseen end date: 09/2019 Actual (or anticipated) end date: 11/2019

Activities completed

B.7.1. Fine-tuning of basic data to calculate criteria and indicators

Task B.7.1 consisted of the fine-tuning of basic data to calculate the criteria and indicators to evaluate the maturity of old-growth forests of reference. To follow on from action B3, enabling the required indicators to be identified, those requiring complementary basic data from sources other than fieldwork in the forests were selected. For the most part these are cartographic data relating to the human footprint -old and recent- criterion.

For the first criterion, the following baseline data are currently available: the topographical model of the terrain (MDE), the forestry map of Spain and the map of protected natural spaces, and the list of links to historical ortho-photos for Spanish regions in which these are available.

The working data for the second criterion, spatial integrity, is the cartography relating to forest cover continuity, forest density and distance to core areas.

B.7.2. Conceptual Design of the Tool Modules

During 2018 this activity was carried out by a researcher from the CREAF (permanent staff) and a technician hired by the project from its inception (additional staff). The design consists of different modules (see PDF document; Annex 7.2): i) module 1: cartographic visualization with the map of the RedBosques reference stands with filtering options and visualization of basic data for each forest (includes the option to generate a file in PDF format of the selected forest with the data of all the indicators of naturalness evaluation); ii) module 2: management of the user registry for data entry authorization; iii) module 3: input of field sampling data, includes a cartographic digitization module to delimit the reference stand; iv) Module 4: evaluation and comparison of the maturity of mature stands to which a sub-module was added in 2019 for comparison with data from the Third National Forest Inventory (IFN3).

B7.3. Development and implementation

From September 2018 to September 2019, a computer technician (additional staff) was hired to develop and implement the tool (action B7.3). During the 13 months of the contract, all the tool modules initially planned were implemented.

For the detection and correction of errors, internal tests were carried out as the different modules were completed. When the tool was in its final stages of implementation, it was made available to the participants of the three editions of the "Mature Forests: values, characterization and management criteria" course within the formative actions of action B8. The errors that users were detecting were corrected during the last months in parallel to their implementation.

Finally, the document "Reference stands network; Technical manual" was elaborated and uploaded to the web. It includes a complete description of the tool, the criteria and indicators and the assessment process (Annex B7)

For the development of the tool, to agree on the criteria and indicators and the weights used in the calculation algorithms, two meetings of the Advisory Committee were held, on November 21-22, 2017 in Cova de Avellanés (Roquetes) and on November 27 2019 in Zaragoza.

Expected results

Expected result: R14. Reference forest assessment and monitoring tool available

Result achieved: Reference forest assessment and monitoring tool available

<http://redbosques.creaf.cat/redbosques>

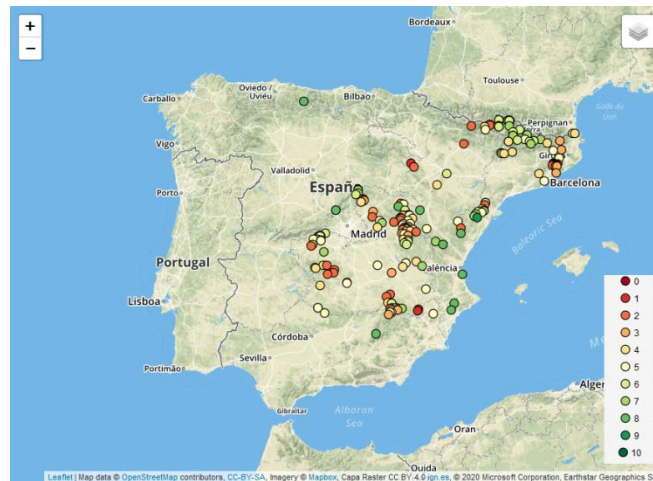


Figure 6. Map displaying surveyed forest stands, as shown in the online tool developed for the project

Future perspectives

The tool together with the georeferenced database is hosted on a CREAM server (<http://redbosques.creaf.cat/redbosques/>). In the coming years, CREAM is responsible with its own staff for the maintenance of the server, for the correction of errors in the tool, for the administration and management of the database and for giving personalized help to users.

B.8. TRAINING ACTIONS FOR PROFESSIONALS IN THE NATURA 2000 NETWORK

Foreseen start date: 10/2016 Actual start date: 11/2018
Foreseen end date: 12/2016 Actual (or anticipated) end date: 07/2019

The project outcomes were progressively compiled and organized in order to build the contents of the project training actions. The aim of this training was to provide practical tools for identify and measure forest maturity, as well as to show the utility of reference stands network and to facilitate technical criteria for including maturity attributes into protected areas forestry. The training target was forestry/protected areas managers, forest owners and entrepreneurs/researchers/NGO's related to conservation/adaptation forestry.

The action was developed during 2019 in a three-edition course of 75 hours (55 on-line; 20 at field) for 25 participants each, as follows:

- **1st edition** (February 18th – March 28th). Field sessions at Els Ports Natural Park (Tarragona).
- **2nd edition** (March 25th – May 5th). Field sessions at Sierra de Cazorla, Segura y Las Villas Natural Park (Jaén).
- **3rd edition** (May 13th – June 16th). Field sessions at Monte de Valsaín – Sierra de Guadarrama National Park (Segovia).

Trainer staff was formed by FUNGOBE / CREAM experts and forestry/protected areas managers of each hosting protected area.

The course title was 'Old-growth forests: value, characterization and management criteria' and contents were organized in 5 weeks as follows (complete program is available in Spanish on Annex B8):

1. *Old-growth forests (I)*. Importance at global, European and national level. Structural characteristics and other definitions.
2. *Old-growth forests (II)*. Biodiversity. Old-growth forests management.
3. *Forests and Natura 2000 Network*. Conservation status of forest habitats of community interest. Old-growth forest stands as a reference of favorable conservation status.
4. *Field sessions into N2000 sites*. Searching and measuring maturity (applied methodology). Forestry for conserving and adapting forests to climate change into N2000 sites.
5. *Final exercises*.

Training course was previously announced in project communication platforms and in *Quercus* magazine.

Finally, 344 applications were received. A selection process had been applied through the following criteria:

- Training target representativeness and diversity
- Geographical diversity.
- Gender ratio (50/50 if possible).

An on-line evaluation form was provided to participants by mail at the end of the course. Table 7 shows each item score of the course.

Table 7. Training evaluation per item (N=50).

	Totally disagree	Disagree	Not disagree/Not agree	Agree	Totally agree
The working plan of the course was correctly informed			2	6	42
Content distribution was related to its importance		2	2	14	32
Information provided was suitable		2		13	35
Learning was clearly applicable to my professional activity			6	17	27
Teachers knowledge was up to date			4	13	33
Academic coordination was suitable			2	10	38
Learning has improved my training on old-growth forest and conservation/adaptation forestry			2	16	32
In general, learning has been satisfactory			2	12	36
Teachers work on on-line platform was suitable				18	31
On-line platform was easy to use			6	24	20
Mandatory papers were suitable			2	17	31
Optional papers were suitable		2	1	22	25
Tasks and practices were linked to course targets			2	14	32
The discussions proposed were interesting			7	20	23

Results

Expected result: R15. At least 75 forestry/N2000 professionals improve their training.

Achieved result: 344 applications received. 75 applicants were selected and received training. Evaluation shows a high satisfaction level with training activities.

Future perspectives

The high level of interest showed in these training activities led FUNGOBE to arrange more training actions related to old-growth forests and conservation/adaptation forestry.

During 2019, FUNGOBE applied for a training project included into EmpleaVerde program (launched by Fundación Biodiversidad - Spanish Ministry of Ecological Transition and Demographic Challenge) and co-funded by European Social Fund (ESF).

Proposal was accepted and training project is currently in progress. More than 100 people is expected to participate.

B.9. TECHNICAL MATERIALS FOR THE MANAGEMENT OF MEDITERRANEAN FORESTS IN THE NATURA 2000 NETWORK

Foreseen start date: 10/2016 Actual start date: 07/2018
Foreseen end date: 12/2019 Actual (or anticipated) end date: 03/2020

B9.1. Preparation of technical manual

The process of preparing the Project's technical manual has followed the following phases:

1. Definition of contents: preparation of a content proposal that will include the main results of the Project: characterization of mature forests, reference stands and criteria for forest management with conservation objectives.
2. Compilation of existing material generated by the Project in actions B3, B4, B5, B6, and B7 and bibliographic review of existing scientific and technical literature.
3. Request in the Reference Group for pilot cases to be included in the manual, and other complementary material (example texts, diagrams, photos).
4. Preparation of a first draft and meeting of the advisory committee in Madrid on 10/17/2019 to agree on the final structure of the document, level of detail of the contents and distribution of tasks among the drafting group.
5. Preparation of final document, diffusion among the drafting group, compilation of drafts and text editing
6. Final draft was set to 4 independent referees (Alfonso Sanmiguel, Polytechnic University of Madrid; Francisco Lloret, CREA; Reyes Alejano, University of Huelva, Helios Sanz, Autonomous University of Madrid) and their recommendations integrated in the final version.
7. The graphic edition and printing (500 copies) was assumed by the Generalitat de Catalunya. FUNGOBE assumed the impression of 200 additional copies.
8. A directory of 460 recipients was prepared for postal mailing of paper version.
9. Translation of the manuscript into English. Graphic design of the English version.
10. The final document in Spanish and English was uploaded to the Project website for dissemination among stakeholders (see Action D1). Manual was submitted via email in pdf version to all de Directory

Manual in pdf available in Spanish and English is in Annex B9.1

B9.2. Production of audiovisual material

Three videos have been produced and disseminated. All accessible at http://redbosques.eu/materiales_divulgativos

- 1) "Old-growth forests, shelters of biodiversity" (6.06 min). Produced by FLYHUNTER Productions, with recordings in Els Ports, Sierra de Guara and Alto Tajo.
- 2) "Old-growth forests, models for a new forestry" (9.38 min) About best practices for forest management with conservation, showing the pilot actions in Els Ports (Action 6.2) produced by 291 SCIENCE FILMS.
- 3) "Network of Reference Forests" (10,40 min) produced by 291 SCIENCE FILMS. Explains the meaning of reference forests, with new recordings in Barcelona, Girona and Guadalajara.

The videos are available on the web and have been disseminated through FUNGOBE's communication channels (see Action D1). They are also part of the teaching resources of the training actions (Action D8).

Results

Expected result: R16 Technical manual on management of forests in N2000. Distributed to 1000 recipients

Result achieved: “Manual 14. Mediterranean Old-Growth Forests: Characteristics and Management Criteria in Protected Areas” in Spanish and English versions. Distributed to 1.726 recipients. 1.379 downloads.

Expected result: R17. Three videos on mature forests, good practices and forest management compatible with conservation accessible online.

Result achieved: Three videos produced, accessible online. 7.533 views in total (YouTube, Facebook, Twitter)

Modifications performed

Due to the COVID-19 Lockdown the postal delivery of the manual was not possible on schedule. It was delayed until June 2020, when confinement measures allowed opening public buildings.

C.1. PROJECT IMPACT MONITORING PLAN

Foreseen start date: 12/2016 Actual start date: 03/2017
Foreseen end date: 12/2019 Actual (or anticipated) end date: 04/2020

C1.1. Project impact monitoring plan

Activities Completed

In this action the effects of the project have been measured on three levels:

I. Effect of the improvements to forest habitats of Community interest

Level I is evaluated by means of quantitative indicators at the conclusion of the project, in comparison with the objective values precept in the proposal:

	Final value (expected)	Final value (actual)
No. of forests of reference identified	15	169 candidates/43 selected
Surface area of forest habitats with management schemes in line with the project results	5.000 ha	26.856 ha
Surface area of forest habitats in which conservation or adaptation actions are conducted	50 ha	260 ha

II. Improvement in the target audience's skills

	Final value (expected)	Final value (actual)
Percentage of the target audience that improves their training in forest management and Natura 2000	80%	82,00%

III. Improved transfer of project results to the target audience and to stakeholders.

	Final value (expected)	Final value (actual)
Number of entities that receive Project information, disaggregated by types of stakeholders	N/A	100,00%
Percentage of the target audience that improves their awareness of the importance of forest management in N2000 with conservation and adaptation objectives	N/A	72,00%

In order to get indicators of levels II and III a specific study was deemed necessary. A survey was conducted with this aim among the target audience at the beginning and at the end of the project. The resulting document is available at Annex C1.

The results show a significant change in the training and awareness of the target audience, according to the project's objectives and attributable to it. In this sense, the objective set for action

C1 in the formulation of the project has been met (80% of the target audience improves their training in forest management with conservation and adaptation to climate change objectives).

This change is similar to that observed in the perception of the importance of the most important aspects related to LIFE RedBosques. 70% of the target audience values more aspects such as the maintenance of standing dead wood, the preservation of mature forests or the importance of adapting forest habitats to climate change, and considers this change attributable to the content and messages launched from LIFE RedBosques.

The knowledge transfer activities and resources generated by the project are valued positively or very positively by more than 60% of the respondents. Among the first, technical publications, face-to-face activities (seminars, mobility and courses), and the database of good practices stand out, while the best valued resources have been the technical and methodological manuals generated in the project.

A significant part of the respondents has incorporated the concepts and ideas of LIFE RedBosques into their professional field, especially for the drafting, design and execution of projects and management plans, without underestimating the own improvement in knowledge that has led to the execution and implementation project progress.

C1.2. Socio-economic impact of the Project

Activities Completed

The direct economic impact of the project can be estimated in the direct jobs in the entities that form the partnership and the expenses incurred.

Regarding direct employment, it is estimated at 3.30 full time equivalents.

But LIFE RedBosques have also generated employment indirectly through investments made by different public administrations in the heat of the project in terms of managing the maturity and conservation of forest habitats (see tables 4 and 5 of the socioeconomic report, Annex C1) .

The accommodation and subsistence expenses of the participants in the seminars, courses, mobilities and follow-up visits have meant that around 50,000 euros have had an impact on the local economies of the territories in which these events were held.

On the other hand, the project has allocated some 93,000 euros to different technical assistance that has been carried out by professionals and small companies.

However, the impact of the project may be much more important should the forest management approach would be fully implemented. To assess that, a document has been elaborated which includes, with data and concrete examples, the economic and social impact that the RedBosques forest management and networking model has had, both for forest owners and for society as a whole. Evidence of the effects of the project on the incorporation of the concept of mature forest in the technical field is provided. In particular, the investments made during the duration of the project are shown: for the identification of old-growth stands and for silvicultural management aimed at promoting maturity. These data show the technical, economic and social potential that can be achieved if these actions are multiplied in a broader territory over the years.

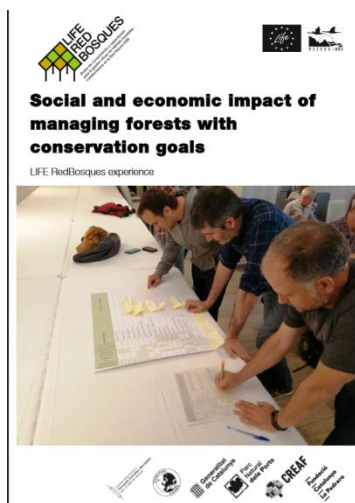


Figure 7. Socioeconomic impact of the project

Achieved results

Expected result: R18. Assessment report on the impact of the project.

Achieved result: Report available online.

D.1. COMMUNICATION PLAN

Foreseen start date: 10/2016 Actual start date: 10/2016
Foreseen end date: 30/04/2020 Actual (or anticipated) end date: 04/2020

Activities performed and achieved results

As a first step in developing communication within the project, and in order to ensure its coherence, a communication plan was drawn up. This document, open to modifications on a permanent basis, is provided at Annex D1.0.

D.1.1. Presentation of the project

The Presentation of the LIFE Project was held on 16 February 2017 in the scientific conference hall, Module 0, Faculty of Science, at Universidad Autónoma de Madrid, with the title *"What should we do with our forests? Future perspectives and challenges in the conservation of Mediterranean forests."*

The event was honoured with guest speaker Francisco Lloret (researcher at CREAL and Professor at Universidad Autónoma de Barcelona). The project was presented by its partners and a round table was conducted with authorities with responsibilities as managers of protected areas (Natura 2000) and forests in several autonomous regions.

Of the 67 participants registered, a total of 61 attended and took part in the debate after the conclusion of the round table. Attendees were given a dossier with information on the project (document folder and data sheet).

The materials produced for the events (poster, signature forms) are attached at Annex D1.1.



Photo 4. Speakers at the presentation of LIFE RedBosques

D.1.2. Dissemination of project results and advances

Notice boards

A noticeboard has been designed giving an explanatory summary of the project, five copies of which have been distributed among the partners, and installed at the FUNGOBE, FunCat, Creaf and Parc Natural Ports offices. The noticeboard can be find in Annex D.1.2.1 downloaded from the project website: <http://www.redbosques.eu/materiales>.



Figure 8. Noticeboard designed for LIFE RedBosques

Layman report

At the end of the project an informative report of the project has been prepared, summarizing the project actions and result in a clear language, delivered to a wide audience (Annex 1.2.2).

Graphic design has been contracted to The Europarc Federation

It is available on paper (200 copies) and electronic format, in Spanish and English and available on the project website.

It has been disseminated to target audience, stakeholders and interested general public through the project newsletter and social media both of FUNGOBE and Europarc Federation.



Figure 9. Layman report

Website

A specific project website has been designed for the project: www.redbosques.eu.

This website offers in an organized way, all the materials generated by the project, along with information on the various project actions as these are conducted.

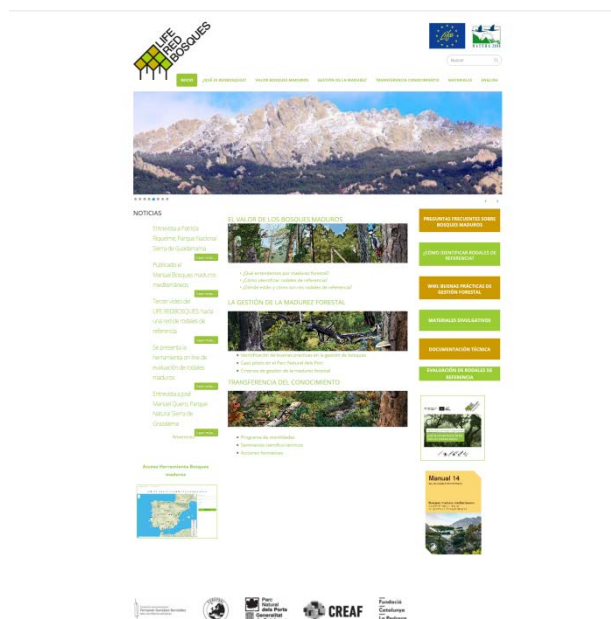


Figure 10. Screenshot of the LIFE RedBosques website

The site www.redbosques.eu was launched in January de 2017, and statistics are available from February 1st 2017. Basic website statistics from that date until April 30th 2020, are given below.

Table 8. Basic statistics regarding visitors to the project website.

	No.
Total number of visits	64,442
Number of single pages viewed	44,048
Average time on page	00:03:13
Entries (sesiones)	21,213
Bounce rate	45.28%
Exit rate	32.64%

Below is a breakdown, in order of magnitude, of the site's 10 most visited pages:

Table 9. Visits to the website sections registered up to 30/04/2020.

	Página	Número de visitas a páginas
1.	Homepage	12,088
2.	Definición de rodales de referencia	5,648
3.	Materiales	3,349
4.	Acciones formativas	2,240
5.	Documentación técnica	2,106

6.	Red de rodales del proyecto	1,852
7.	Noticia sobre bosques maduros, características y valor de conservación	1,757
8.	Programa de moviidades de técnicos	1,607
9.	Acciones	1,544
10.	Novedades	1,196

A total of 14.360 PDF were downloaded from the Redbosques.eu website from March 1st 2017 to April 30th, 2020. The 10 most downloaded documents in this period are given in table.

Table 10. The 10 most downloaded documents and number of downloads up to 30/04/2020.

DOCUMENT	No. of downloads
Los bosques maduros: características y valor de conservación	2,184
Folleto Curso “Bosques maduros. Valores, caracterización y criterios de gestión”	1,456
Manual “Bosques maduros mediterráneos”	1,379
Preguntas frecuentes sobre los bosques maduros	1,351
Póster “¿Cómo es un bosque maduro?”	678
Panel bosques maduros (Los Palancares)	489
Panel bosques maduros (Monte de Valsaín)	486
Hoja informativa RedBosques	480
Manual de campo para la identificación de rodales maduros de referencia (Fase I)	392
Manual de campo para la identificación de rodales maduros de referencia (Fase II)	323

Information about the project is also included in Europarc España and Fungobe websites

Dissemination of News and Events

Press releases have been elaborated for the main events and project milestones (Annex D.1.2.4). 85 reviews on the project have been found in different media. Table 9 lists the reviews, with the name and type of the medium.

Table 11. List of reviews published on the project (see Annex D1.4).

Date	Media	Title
01/01/2017	Revista EUROPARC 42	LIFE redes de conocimiento y capacitación para la gestión eficaz de hábitats forestales mediterráneos de la Red Natura 2000 en España
01/01/2017	Boletín RENPA	Life RedBosques para la gestión eficaz de hábitats forestales mediterráneos de la Red Natura 2000
01/02/2017	Cingles	Incorporando la ciencia a la gestión: El Grupo de Conservación de bosques de EUROPARC-España
16/02/2017	Efeverde	Bosque mediterráneo: nuevas formas de gestión frente a nuevas amenazas
16/02/2017	Lavanguardia	Un proyecto busca modernas soluciones para las nuevas amenazas del bosque
16/02/2017	eldiario	Un proyecto busca modernas soluciones para las nuevas amenazas del bosque
16/02/2017	cuatro.com	Expertos destacan la importancia del intercambio de responsables en gestión de los

Date	Media	Title
		bosques mediterráneos para mejorarlos
16/02/2017	europapress	Expertos destacan la importancia del intercambio de responsables en gestión de los bosques mediterráneos para mejorarlos
16/02/2017	elconfidencial	Un proyecto busca modernas soluciones para las nuevas amenazas del bosque
16/02/2017	Blog CREA	Presentat 'LIFE RedBosques', projecte per a la gestió dels boscos mediterranis
16/02/2017	Generalitat Catalunya	Es presenta a Madrid el projecte LIFE RedBosques
16/02/2017	Diario Siglo XXI	Expertos destacan la importancia del intercambio de responsables en gestión de los bosques mediterráneos para mejorarlos
16/02/2017	Ecodiario.es	Expertos destacan la importancia del intercambio de responsables en gestión de los bosques mediterráneos para mejorarlos
16/02/2017	CienciasAmbientales	Se presenta el proyecto LIFE RedBosques
16/02/2017	Web EUROPARC-España	Gran acogida en la presentación el LIFE RedBosques
16/02/2017	Nuestras ciudades	Invitación a la Jornada de presentación del proyecto LIFE RedBosques
16/02/2017	Lanza Digital	Bosque mediterráneo: nuevas formas de gestión frente a nuevas amenazas
01/03/2017	Boletín RENPA	Life RedBosques para la gestión eficaz de hábitats forestales mediterráneos de la Red Natura 2000
05/03/2017	Diari de Tarragona	El Parc Natural dels Ports, centre d'un projecte europeu de gestió dels boscos
01/05/2017	Federación EUROPARC	New LIFE Project RED BOSQUES (Annual REPORT 2016)
10/05/2017	Web EUROPARC	What do we do with our forests?
30/06/2017	Revista EUROPARC 43	Avances en LIFE RedBosques
01/08/2017	Boletín Red Rural Nacional	RedBosques: gestión de los hábitats forestales mediterráneos de la Red Natura 2000
01/08/2017	europa.eu	LIFE_Redcapacita2015 - Networks of knowledge and training for the effective management of Mediterranean forest habitats of Nature 2000
24/11/2017	Blog CREA	¿Qué es y cómo se gestiona un bosque maduro? Encuentro en el PN dels Ports
28/11/2017	Bioma Forestal	Seminario Red Bosques
15/12/2017	EUROPARC-España	Conclusiones del Seminario LIFE RedBosques celebrado en Ports en noviembre
19/12/2017	Generalitat Catalunya	Conclusiones del Seminario LIFE RedBosques celebrado en el Parque Natural de Els Ports
21/12/2017	Revista EUROPARC 44	Avances en LIFE RedBosques
01/01/2018	Carpeta Informativa del CENEAM	LIFE RedBosques: Hacia un nuevo modelo de gestión de los bosques mediterráneos
01/01/2018	Boletín electrónico EUROPARC-España	La cuarta movilidad del Life RedBosques se desarrolla en Montseny y Alta Garrotxa
07/01/2018	Boletín EUROPARC-España	RedBosques en la Carpeta Informativa del CENEAM: hacia un nuevo modelo de gestión de los bosques mediterráneos
24/01/2018	Boletín Colegio Ingenieros de Montes	LIFE RedBosques: Hacia un nuevo modelo de gestión de los bosques mediterráneos
19/02/2018	Web Turismo Grazelema	¿Cómo son los bosques maduros? Descárgate el poster del proyecto Redbosques
01/03/2018	Circular de la Institució Catalana d'Història Natural	Gestió de boscos mediterranis en àrees protegides
04/03/2018	Web CSIF	Csif informa: LIFE RedCapacita. Abierta la Segunda Convocatoria de Movilidades
06/04/2018	uam.es	El proyecto LIFE RedBosques continúa en 2018 con sus acciones de intercambio entre profesionales de la gestión de bosques y espacios protegidos.
04/05/2018	Web FUNGOBE	Nuevas movilidades de técnicos dentro del proyecto LIFE RedBosques
01/06/2018	Biblioteca técnica agraria	¿Qué es un bosque maduro? ¿Cómo conservar los bosques maduros?
11/06/2018	Revista Montes	Tercera movilidad del proyecto LIFE RedBosques
12/06/2018	Boletín EUROPARC-España	La cuarta movilidad del Life RedBosques se desarrolla en Montseny y Alta Garrotxa
12/06/2018	Boletín EUROPARC-España	La Universidad de Huelva organiza un seminario sobre bosques viejos frente al cambio climático
20/06/2018	Web Consorci Alta Garrotxa	El Programa de mobilitat del Projecte LIFE RedBosques visita els boscos de l'Alta Garrotxa

Date	Media	Title
30/06/2018	Boletín EUROPARC-España	Últimas actividades del proyecto LIFE REDBOSQUES
19/07/2018	Web Turismo Grazaalema	¿Conoces lo que es un bosque maduro?, El programa LIFE Redbosques que está buscando rodales de bosques maduros mediterráneos en España
02/10/2018	Aragon_Hoy	Los bosques maduros como referencia para la evaluación del estado de conservación de los hábitats forestales
03/10/2018	Web Federacion EUROPARC	Frequently Asked Questions about Mature Forests – LIFE Red Bosques
22/10/2018	Boletín electrónico Federación EUROPARC	Old Growth Forests. All you need to know about mature forests
01/11/2018	Web LIFE Pinassa	El Life Pinassa presenta una comunicación en las Jornadas del LIFE Red Bosques
01/12/2018	Web Junta de Andalucía	El Parque Natural Sierras de Cazorla, Segura y Las Villas participa en un seminario del proyecto Life RedBosques
11/12/2018	Boletín EUROPARC-España	El proyecto LIFE RedBosques recopila una veintena de actuaciones selvícolas con objetivos de conservación
30/12/2018	Revista EUROPARC-España 46	Últimas actividades del proyecto LIFE REDBOSQUES
01/02/2019	redruralnacional.es	RedBosques: gestión de los hábitats forestales mediterráneos de la Red Natura 2000
21/03/2019	Gencat.cat	Celebrem el dia internacional dels boscos amb Life REDBOSQUES
21/03/2019	Federación EUROPARC	Why are Old-growth forests important?
31/03/2019	Quercus	Bosques maduros, también en el Mediterráneo
02/05/2019	lavanguardia.com	Cazorla acoge un curso de ámbito nacional del LIFE RedBosques
02/05/2019	20minutos	Cazorla acoge un curso de ámbito nacional del LIFE RedBosques
02/05/2019	infojaen	Celebrado el curso de ámbito nacional del Life Redbosques en el Centro de Capacitación y Experimentación Forestal de Cazorla
02/05/2019	ondacerojaen	El Centro de Capacitación y Experimentación Forestal de Cazorla acoge un curso de ámbito nacional
02/05/2019	europapress	Cazorla acoge un curso de ámbito nacional del LIFE RedBosques
25/05/2019	Diario de Teruel	Técnicos de Medio Ambiente de toda España conocen el rodano turolense
30/06/2019	Revista EUROPARC-España 47	Últimas actividades del proyecto LIFE REDBOSQUES
06/09/2019	OAPN	Montes están sucios
17/10/2019	Blog BIOMA FORESTAL	LIFE RedBosques
30/12/2019	Revista EUROPARC-España 48	Últimas actividades del proyecto LIFE REDBOSQUES
27/03/2020	Federación EUROPARC	Challenges for the new EU Forest Strategy
30/03/2020	Revista Montes 139	Redbosques. Una red para la madurez forestal
08/04/2020	Federación EUROPARC	Why do we need old growth forests?
16/04/2020	El Guadarramista	Nuevo manual sobre nuestros bosques maduros mediterráneos
16/04/2020	EUROPARC-España	Se presenta el Manual sobre Bosques maduros mediterráneos: características y criterios de gestión en áreas protegidas
20/04/2020	20minutos	El Parc dels Ports, uno de los espacios para un estudio del modelo forestal en bosques maduros
20/04/2020	europapress	El Parc dels Ports, uno de los espacios para un estudio del modelo forestal en bosques maduros
20/04/2020	europapress	Cambio climático.- El Parc dels Ports, uno de los espacios para un estudio del modelo forestal en bosques maduros
20/04/2020	Diari Mes Digital	Los parques naturales de los Puertos y del Montseny, escogidos por un estudio sobre el modelo forestal
21/04/2020	Generalitat Catalunya	El Parque Natural de Els Ports, uno de los cuatro espacios naturales escogidos para el estudio del modelo forestal en bosques maduros
21/04/2020	Los enlaces de la vida	Se publica un manual para la gestión de los bosques maduros mediterráneos
21/04/2020	EbreActiu.cat	El Parc Natural dels Ports, un dels quatre espais naturals escollits per a l'estudi del model forestal en boscos madurs
27/04/2020	Forestales.net	Manual "Bosques maduros mediterráneos: características y criterios de gestión en áreas protegidas"
30/04/2020	El Blog del CREAF	Se publica un manual para la gestión de los bosques maduros mediterráneos

Date	Media	Title
04/05/2020	Yahoo Noticias	Publican manual para la gestión de los bosques maduros mediterráneos
05/05/2020	Econoticias	Léete el manual para la gestión de los bosques maduros mediterráneos
22/05/2020	Federación EUROPARC	The International Biodiversity Day & the value of Old-Growth Forests

Most important issues are:

- A summary of the project's initiatives was given under 'Activities' in the EUROPARC-Spain magazine, Nos. 42 (December 2016), 43 (June 2017), 44 (December 2017), 45 (June 2018), 46 (December 2018), 47 (June 2019), 48 (December 2019). (Annex D1.2.4)
- An opinion piece was published in EUROPARC-Spain magazine no. 43: 'Forest protection and forestry management: new approaches to the way forward', by Miquel Rafa of Fundació Catalunya La Pedrera. (Annex D1.2.4)
- A divulgative article was published in *Quercus*, a journal on nature conservation devoted to general public (Annex D1.2.4)
- A summary of the project was published on *Montes*, journal of the Spanish Society of Forest Science (Annex D1.2.4)

The complete list of reviews published in the media with internet links is provided at Annex D1.2.4.

Newsletter

A newsletter is circulated each semester, to give details of the project's advances and record the principal milestones and related events, and to disseminate the materials and documentation generated.

The newsletter is sent to all target audience and stakeholders in the contacts directory. The following issues have been published so far:

- LIFE RedBosques Bulletin No. 1. March 2017.
- LIFE RedBosques Bulletin No. 2. September 2017.
- LIFE RedBosques Bulletin No. 3. March 2018.
- LIFE RedBosques Bulletin No. 4. September 2018.
- LIFE RedBosques Bulletin No. 5. March 2019.
- LIFE RedBosques Bulletin No. 6. October 2019.
- LIFE RedBosques Bulletin No. 7. April 2020.



Figure 11. Screenshot of the LIFE RedBosques bulletin

The Newsletters are available for consultation on the project website:

<http://redbosques.eu/boletines>

Social networks

Twitter:

Content on #RedBosques has been mobilised on social networks through two profiles: @redeuparc, the official account of EUROPARC-Spain, and @fungobe, the official account of Fundación Fernando González Bernáldez [FUNGOBE]. Most of this activity has been channelled through @redeuparc, as the potential impact is greater owing to its higher number of followers, and redistributed through @fungobe.

The most outstanding events in the project (presentation day, field trips, seminar...) were notified through this channel.

Activity through Twitter can be summed up as follows:

- 38 tweets
- 89.329 views
- 2.947 total interactions

The complete list of tweets is provided at Annex D1.2.4.

Facebook:

Content on #RedBosques has been mobilised on social networks through two profiles: @redeuparc, the official account of EUROPARC-Spain, and @fungobe, the official account of Fundación Fernando González Bernáldez. Content published on one account's wall was shared to the other, and vice versa.

Activity through Facebook can be summed up as follows:

- 134 posts
- 143.348 people reached
- 10.751 interactions (like, share)

The complete list of posts is provided at Annex D1.2.4.

D.1.3. Preparation of informative materials for the project

Project logo

A specialised design studio was commissioned to design the project logo, to include several versions adapted to different mediums and materials, personalising the partners' logos to the overall image and reporting format.

The material relating to the project image is given at Annex D1.5.

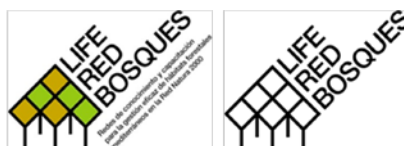


Figure 12. Logo designs for the project

Folders

500 folders have been designed and produced bearing the project logo. The original is attached at Annex D1.6.

Information sheet

The information sheet has been designed containing a project summary, actions pending development, target audience and how to participate in the project, following the graphic line designed for the project. A total of 500 copies in Spanish and 200 in English have been produced. These are available on the project website: <http://www.redbosques.eu/materiales>

The original is attached at Annex D1.7.

Roll-up

A roll-up panel has been designed bearing the project logo, of which 4 units have been produced and distributed to partners for use at events to promote the project.

Training actions brochure

Training actions brochure were designed for Action B8 and disseminated in the web and social networks. A banner was also made to announce the course in Quercus magazine, in April and June 2019. Both can be found in Annex D1.3

D.1.4. Transference and replicability. Networking Actions

D.1.4.1. Replicability on a national scale

As a main channel for transference at a national scale, project results were reported in all EUROPARC-Spain general assemblies. The general assembly comprises general directors or environment in all the Spanish regions, and the Ministry of Ecological Transition. Specific materials were developed to be delivered at the meetings of the general assemblies. These materials are compiled in Annex 1.4.1.

The main results of the project have been sent to the National Rural Network and the Network of Environmental Authorities. Both forums have the ability to influence the design of regional development plans, which could finance the stand conservation and forest management activities proposed in this project.

The Network of Environmental Authorities has forwarded Redbosques' socio-economic and layman reports to all members of its working group on European funds and biodiversity conservation.

Likewise, the results of the project have been transferred to the General Direction of Forest Policy, which is currently drafting the new national forest strategy, and where it is expected that special attention may be included in the conservation of mature stands and the creation of a network nationwide. Those responsible for the project were invited to the next meeting of the national forestry committee, to present the proposals of RedBosques

A number of events, seminars and workshops were held at the technical level to maximize the transference of the project results to the stakeholders, among which we can highlight the the Europarc Spain Congress or the participation in events of other LIFE projects such as Biorgest. Below is a summary of all Networking Actions performed at a national level.

Table 12. Transference and replicability actions performed nationwide.

DATE	PLACE	EVENT	AUDIENCE
16/02/2017	Madrid, UAM	Project Presentation Day	Scientists, professors, university students, administration officials
22/02/2017	Sevilla	Meeting -face to face and virtual (Skype)- of the Department for the Environment of the Junta de Andalucía	Heads of protected spaces and forestry management units, and Managers-conservation stewards of natural parks
17/03/2017	Madrid (ICEI)	Meeting with FSC Spain	Director and technician from the Office of FSC Spain
07/02/2017	Roquetes	Presentation at the Governing Board of the Parc Natural dels Ports	Local authorities (Mayors, etc.)
19/04/2017	Valladolid	Presentation to the Forestry and Protected Areas Units (Department for the Environment of the Junta de Castilla y León)	Heads of forestry management units and planning technicians.
06/05/2017	UAM Madrid	Session at the Master's Degree in ENP 2017: 'Conservation of old-growth forests'	Postgraduate students
18/05/2017	Karrantza	Seminar on 'Forestry management with conservation aims in Natura 2000'	Administration technicians and forest rangers
01/06/2017	Castellón	Presentation of RedBosques project	LIFE Technicians
30/06/2017	Plasencia	National Forestry Conference	Professionals in the field of forestry
15/06/2017	PN Ports, Tarragona	Study trip in the Master's Degree in ENP 2017	Postgraduate students
18/10/2017	Roquetes	Conference on "Biodiversitat dels boscos madurs"	Technicians, professionals, forest rangers
28/09/2017	Oleiros	RECIDA 2017 Presentation of the project	Heads of Spanish documentation centres
25/10/2017	Madrid	Presentation in the EUROPARC-Spain booth at the meeting of the Spanish Association of Geographers	Professionals in the field of Geography
30/11/2017	Lousame, Galicia	Personal communication Comunidade do monte veciñal en man común de Froxán (Galicia)	Forest managers
28/09/2017	Cazorla, Jaén	Personal communication Centro de Capacitación e Investigación Forestal. Junta de Andalucía	Forest managers

DATE	PLACE	EVENT	AUDIENCE
14/10/2017	Jaen	Personal communication Provincial forestry management service of Jaén. Junta de Andalucía	Forest managers
18/10/2018	Ciudad Real	Presentation of the QuMATURE project (INIA). Hunting Research Center (CSIC)	Scientists, park managers
05/07/2018	Comunidad de Madrid	Presentation of the LIFE REDBOSQUES project Ministry of Territorial Planning and Environment	Forest managers, N2000 managers
6/10/2018	Tamajón (Guadalajara)	Methodology test of characterization of mature stands	Forest managers, N2000 managers
26/07/2018	Peñalba de la Sierra (Guadalajara)	Methodology test of characterization of mature stands	Forest managers, N2000 managers
04/04/2018	Madrid	Conference "Fire in protected natural areas, between threat and conservation" Ministry of Agriculture, Food and Environment	Forest extinction and park managers
29/06/2018	Universidad de Huelva	Seminar "Old forests against climate change. Vulnerability, adaptive capacity and implications for forest management "	Post graduate students
19/04/2018	Universidad Autónoma de Madrid	Session on mature forests in Master in Protected areas	Post graduate students
5-7/11/2018	Atienza (Guadalajara)	Invitation to the RedBosques Seminar	Invited scientists
29/05/2019	Sant Celoni	LIFE Biorgest Advisory Committee Meeting	Forest and park managers, NGO
27/07/2019	Nerja (Málaga)	Mature Forest Conference as a conservation strategy	Forest managers
30/09/2019	Madrid	Visit the National Parks Chair	Professor
22/11/2019	Madrid	Visit to DGI Forestry Policy	Deputy director
18/01/2020	Gallocanta	II Festival of the cranes	General audience

D.1.4.2. Replicability on an international scale

Replicability at an European scale was fostered presenting the project and making collaborations with many entities, among which we can highlight the European Congress of the Europarc Federation, or the participation in events of other European projects such as LIFE GoProFor. Below is a summary of Networking Actions performed with international bodies during the period covered in this report.

Table 13. Transference and replicability actions performed internationally.

DATE	PLACE	EVENT	AUDIENCE
22/06/2017	Padua (Italia)	2nd Alpine Natura 2000 Seminar - Natura 2000 Biogeographical Process (Padova, Italy. 21-23 June 2017)	European Scientists and Professionals Natura 2000
10/09/2017	Sao Pedro do Sul (Portugal)	Presentation LIFE RedBosques	European protected spaces professionals
15/10/2017	Internet	Dissemination on the Communication Platform of the Bio-geographical Process	European Scientists and Professionals Natura 2000

DATE 15/09/2017	PLACE Brussels	EVENT Conference on protection of old-growth forests in Europe	AUDIENCE Conservationists, NGOs, representatives from EU countries
14/11/2017	Cyprus	2nd Mediterranean Natura 2000 Seminar - Natura 2000 Bio-geographical Process (Limassol, Cyprus. 14-16 November 2017)	European Scientists and Professionals Natura 2000
18-21/09/2018	Parque Nacional Cairngorms, Escocia	Presentation at the EUROPARC 2018 Congress	European park managers
Oct 2018	European Commission webpage	Dissemination on the communication platform of the Biogeographical Process	European scientists and Natura 2000 professionals
15/03/2019	Frankfurt Zoological Society	Collaboration in database on mature forests in Europe	Scientists
24 a 27/09/2019	Jūrmala (Letonia)	EUROPARC annual Conference	Park managers
11/11/2019	Palermo (Italia)	GoProFor Conference	European Forest and N2000 managers
12/11/2019	Palermo (Italia)	GoProFor 2.0 Workshop	European Forest and N2000 managers
4-5/02/2020	Bruselas	Int. Conf. Forests for biodiversity & climate	Scientists, European Forest and N2000 managers
13/02/2020	Bruselas	Materials sent to the Biogeographic Platform	European Forest and N2000 managers
15/04/2020	Bruselas	Submitting suggestions for the European Adaptation Strategy	European Forest and N2000 managers
4/03/2020	Bruselas	Submitting suggestions for the European Forest Strategy	European Forest and N2000 managers

To guarantee replicability on a European scale, an agreement with the Europarc Federation was reached, in order to disseminate project results using their communication tools. Actions performed were:

Table 14. Communication actions developed by Europarc Federation for LIFE RedBoisques

DATE	ACTION	MEDIA
10/05/2017	What do we do with our forests? Life RedBosques – EUROPARC Spain	Article and social media share
22/12/2017	Protecting old-growth forest in Europe	Conference
21/03/2018	“Old-growth forests: characteristics and conservation value” by EUROPARC Spain	Article and social media share
26/07/2018	Call for good practices: Forest management for climate change adaption	Article and social media share
22/05/2020	The International Biodiversity Day & the value of Old-Growth Forests	Article and social media share
27/03/2020	Challenges for the new EU Forest Strategy	Article and social media share
08/04/2020	Why do we need old growth forests?	Article and social media share
22/05/2020	The International Biodiversity Day & the value of Old-Growth Forests	Special newsletter

As one of the final results of the project, and at the request of EASME, two documents were prepared with suggestions for the European adaptation strategy and the European forestry strategy, currently being drafted, with the main contributions derived from the project. The documents were sent by EASME to the DGAgri and DGEEnv for their consideration. They are collected in Annex D.1.4.2.

Results

Expected result R19.1: Project website with 10,000 visits per year

Achieved result: to date, 64,442 visits in total; 18.412 visits/year.

Expected result R19.2: 500 publications downloaded.

Achieved result: 14,360 downloads.

Expected result R20: distribution of six newsletters to all project contacts:

Achieved result: seven newsletters distributed to all project contacts.

Expected result R21: Dissemination of project milestones and results to a wide audience:

Achieved result: 85 reviews in the media.

The full range of communication and networking actions aims to catalyse the project's replicability at other locations, involving new players, ultimately contributing to the transfer of a new management model. It is almost impossible to view the contribution of each individual action to the end result in isolation, owing to the complex interactions. The lessons learned through the replicability actions are summarized in a Replicability Report (Deliverable - Annex D1.4.3)

Modifications performed

Complementary to the mentioned communication actions, some materials which were not in the project proposal have been developed (Annex D1.4.4):

- Poster on old-growth forests: an informative poster showing the principal characteristics of old-growth stands, in digital format for downloading, printing or dissemination on social media. Available on the project website in Spanish and English: <http://www.redbosques.eu/materiales>.



Figure 13. Informative poster on old-growth forests.

- Information panels: a series of information panels are being designed to inform visitors on the value of old-growth forests, for installation in the field. These panels offer general information on old-growth forests with details on the specific location. They have

been installed in old growth stands in the Sierra de Grazalema Natural Park (Andalusia), Palancares Natural Monument (Castilla-La Mancha) and Parc Natural dels Ports (Catalonia).



Figure 14. Proposed information panel design

- European Parks Day 2018 Photography Contest: The seventh edition of the European Parks Day Photography Contest was organized, with the collaboration of the Spanish Association for Nature Photography (AEFONA), the Photography and Biodiversity Association, the Autonomous Parks Agency National, and a total of 10 tourism companies adhered to the European Charter for Sustainable Tourism in natural areas. The contest included a category of mature forests. The contest decision was made public on May 24. The award in the mature forests category, in which around thirty photographs were submitted, was awarded to Eduardo Viñuales, for a snapshot taken in the Ordesa y Monte Perdido National Park.
- Instagram profile: an Instagram hashtag has been created for sharing photographs of old-growth forests online, open to use by the general public: #redbosques.
- Instagram Photo Contest International Day of Forests 2020: The #RedBosques team joined the celebration of International Day of Forests 2020 on March 21 with a contest in which participants were encouraged to upload images of forests to Instagram tagged #redbosques for two days. There were 50 posts in the activity with the tag #redbosques. The ruling was made public on March 23. The photograph with the most LIKE (88) was a winter snapshot of the mature black pine forest of Virós, Alt Pirineu Natural Park, taken by Marc Garriga, who received a copy of the recently published Manual of Mediterranean mature forests.
- Final event: As a closing event for the project, a day had been planned with several conferences at the School of Forests of the Polytechnic University of Madrid. The act had to be canceled due to the measures derived from COVID-19. It is expected to be able to do it when normality returns. The program and the poster designed for the event are included in Annex D1.4.4.
- The videos, manuals and materials generated in the RedBosques project will be included in the content linked to the App that will be developed at the LIFE eNatura.EDU (it will be available in the summer 2020).

E1. PROJECT MANAGEMENT AND MONITORING

Foreseen start date: 10/2016 Actual start date: 10/2016

Foreseen end date: 04/2020 Actual (or anticipated) end date: 04/2020

Sub-Action E1.1. General management

Agreements with project partners, composition of work team and committees may be found in Annex E1.1.

- The technical team for this action was constituted in October 2016.
- Management Committee: established on 25/10/2016, its main function was decision taking regarding the management and monitoring of the project. The Management Committee met on five occasions.
- Advisory Committee: its main function was to provide technical support to project actions. The Advisory Committee was constituted and became operational in January 2017. The Advisory Committee met on five occasions:
 - 1) 24 November 2016, Zaragoza: criteria for pilot forestry plan.
 - 2) 10 July 2017, Zaragoza: frequently asked questions on old-growth forests.
 - 3) 21 November 2017, Parc Natural dels Ports: field handbooks, data sheets and evaluation system for old-growth stands.
 - 4) 17 September 2019, Madrid: Manual Mediterranean old-growth forests.
 - 5) 27 November 2019, Zaragoza: development of the RedBosques online tool (Action B7).

Sub-action E1.2. Monitoring of project implementation

The evaluation procedure to measure progress was submitted to the Management Committee in October 2016. Five project advancement monitoring reports have been drafted, which were distributed to the members of the Management Committee.

In March 2017 the project impact evaluation procedure (Annex E1.2) was issued.

Sub-Action E1.3 After Life plan

A plan has been designed with the actions that must be carried out in the medium term to ensure the continuity of the results of LIFE RedBosques and identifies possible sources of financing for them. (Annex E1.3)

The proposed objectives and the actions planned to achieve them are the following:

- 1) Consolidate the network of reference stands.
 - 1.1 Continuous monitoring of stand prospecting projects by Europarc members and publication of their progress
 - 1.2 Complete the representativeness of the Network:
 - 1.3 Analysis of stand network data and publication of results
- 2) Promote the inclusion of biodiversity conservation criteria in forest management and forestry.
 - 2.1 Identification of good practices and publication on the wiki
 - 2.2. Thematic webinars on forest conservation
 - 2.3. Training courses for forest management professionals
- 3) Transfer of results to the target audience and promote the use of project tools and results

- 3.1. Dynamization of the reference group:
- 3.2. Publication in the media aimed at the target audience:
- 3.3. Promotion of the results of the project managers of Natura 2000 in the EU

Other Deliverables

- Guidance for the implementation of green purchasing criteria: document drafted in November 2016 (Annex E1.4).

Modifications performed

To facilitate the economic feasibility of the project, the following dates have been set for issuing monitoring reports:

- Mid-term Report: before 31/01/2018
- Progress Report 1: before 31/01/2019
- Final Report: before 31/07/2020

This modification was notified a by e-mail on 30/05/2017.

The new reporting schedule complied with the 18-month rule and allowed administrative control to be applied as the project implementation unfolds. The new dates were established in the partnership agreements signed by each one of the project partners, ensuring the collection of the necessary information to evaluate compliance with the Grant Agreement.

6.2. MAIN DEVIATIONS, PROBLEMS AND CORRECTIVE ACTIONS IMPLEMENTED

The main adjustments to the project during its execution are given below. None of these adjustments has caused a deviation from the initially envisaged results or any significant alteration in the original timeline.

Project extension

Given that the dedication to write the B9 manual in a participatory manner and in order to give time to receive the chapters written by external collaborators and conduct a peer-review process, a 6-month extension was requested, until April 2020 (Annex E1.5).

COVID 19 lockdown

The confinement measures adopted by the Spanish Government had several consequences on the project:

- 1) The postal delivery of Manual 14 (Action B9) was not possible on the scheduled date (April 2020) despite the fact that the document was already finished. The closure of all public administrations and difficulties in traveling advised delaying postal delivery until restrictions were lifted. The shipment was finally made in June 2020.
- 2) A final event of the Project was programmed, with the support of the Escuela de Montes de Madrid, as a way of ensuring the transfer of the results to the academic field. The program consisted of several presentations by the Project partners and a discussion session. Due to the Covid 19 lockdown, the event had to be suspended. The definitive program and the poster that was designed to announce it are in Annex D1.3.3.
- 3) In order to have the target audience time to receive the project materials, the final questionnaire to assess the impact of the project on capacitation and awareness raising was delayed until June 2020.

New organisation for Action B2: field trips

The proposal included three field trips, in 6 groups of 4 people, with a duration of 4 days. However, the response to the first call for participants in these field trips was much higher than expected. Therefore, to accommodate the largest number of applicants as possible, larger groups were arranged.

The first field trip took 11 participants for 3 days, and the second, with 10 participants, was a 4-day trip. This amounted to 147 people per day, many more than the 96 people initially envisaged for the entire project.

Field panel and online poster

It was deemed of great utility to enlarge the scope of the project and design a series of information panels to be installed in the field, at some of the stands of reference identified in action B3. Different stands have been made and installed on the field, in Parque Nacional de Guadarrama (Segovia), Parque Natural Sierra de Grazalema (Cádiz), Paisaje Protegido Palancares y Tierras Muertas (Cuenca) y Parc Natural dels Ports (Tarragona).

The cost of panel and content design is carried by the project while installation costs are covered by the responsible Administration.

In addition, an informative poster on old-growth forests has been prepared for dissemination on social networks and is downloadable from the project website. Is one of the most frequently downloaded documents.

6.3. EVALUATION OF PROJECT IMPLEMENTATION

Methodology

Figure 15 shows the flow diagram of the work methodology followed in the project.

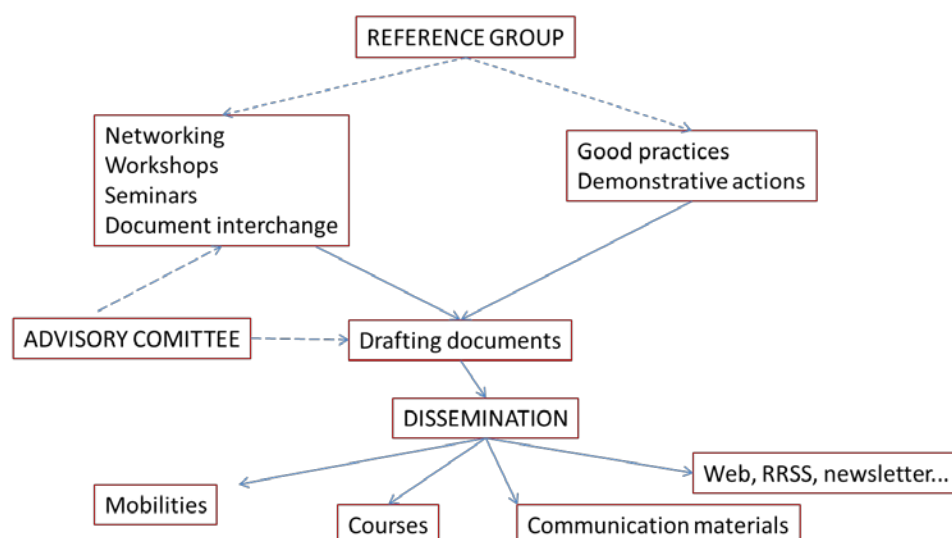


Figure 15. Flow diagram of the work methodology followed in the project.

The main results of the project have been the result of networking in the Reference Group with the advice of the Advisory Committee. The tools used have been seminars, workshops and information exchange through the Forum, and the use of examples and cases of good practices and demonstrative actions. The final documents have been disseminated to the target audience through online media, as well as face-to-face events such as mobilities and courses that have proven particularly effective.

Constant networking and the creation of a network of contacts with frequent face-to-face meetings have favoured a very fruitful climate of work and cooperation that has allowed the development of products with a very high degree of agreement.

Results

Below are the aims and the expected and achieved results of each of the actions completed or in progress, with an assessment of each case.

ACTION	FORESEEN IN THE REVISED PROPOSAL	ACHIEVED	EVALUATION
A1. DRAFTING A DIRECTORY OF CONTACTS AND CONSTITUTION OF A REFERENCE GROUP	<p>Objectives:</p> <p>The aim of this action is to compile a directory with target audience and stakeholders contacts, in order to streamline communication throughout these groups.</p> <p>Expected results:</p> <p>R1. A project directory is generated containing 500 contacts (target audience and stakeholders).</p> <p>R2. A Reference Group is established with 125 members.</p>	<p>The directory currently contains 1.726 contacts.</p> <p>The reference group is currently composed of 123 contacts, all of which belong to the Target Audience.</p>	<p>The directory was permanently updated, adding contacts as project implementation progressed.</p>
B1. TECHNICAL DISCUSSION FORUM	<p>Objectives</p> <p>To enable communication and technical discussion among the target audience.</p> <p>Expected results:</p> <p>R3. A technical discussion forum is set up by 125 technicians with a mean information exchange rate of 5 messages per month.</p>	<p>217 subscribers, mean rate of 3 messages per month.</p>	<p>Discussion forum contacts has been the main channel of communication with target audience. It's a very cost-effective mean.</p>
B.2: FIELD TRIP PROGRAMME FOR TECHNICIANS	<p>Objectives</p> <p>Exchange of experience in the field.</p> <p>To encourage mobility among technical staff (managers and planners) and forest wardens.</p> <p>To support training for technical and field staff.</p> <p>Expected results:</p> <p>R4. At least 20 technical staff improved their skills and the lessons learned were shared on the technical discussion forum.</p>	<p>57 forestry and protected spaces technicians (target audience) have improved their level of training.</p>	<p>The field trips were met with greater enthusiasm than anticipated, which led to larger groups being arranged. The feedback has also been extremely positive. Some participants later led the identification of reference forests in their territories (Valencia, Andalucía, Galicia...)</p>

ACTION	FORESEEN IN THE REVISED PROPOSAL	ACHIEVED	EVALUATION
B3. DEFINITION OF SCENARIOS OF REFERENCE	<p>Objectives</p> <p>Characterization of old-growth attributes in Mediterranean forests, based on the identification of a group of representatives of each type, using standardized protocols</p> <p>Expected results</p> <p>R5. A protocol is generated for implementing the forests of reference network (indicators and joining procedure).</p> <p>R6. Candidate forests to form part of the network of reference are identified.</p> <p>R7. A network of reference forests is created (15 forests identified): at least one forest of reference is identified for each forest habitat type given in the Habitats Directive with a significant presence in the Mediterranean region.</p>	<p>R5. A protocol is available for implementing the forests of reference network (indicators and joining procedure).</p> <p>R6. 169 Candidate forests to form part of the Network of Reference have been identified.</p> <p>R7. A network of reference forests is currently being formed (43 forests have been identified).</p>	<p>A protocol has been agreed for the identification of stands, available on the project website.</p> <p>The autonomous regions involved have pledged a deep commitment to identifying stands of reference.</p> <p>At present, 13 public administrations are engaged in the process of identifying stands.</p>
B.4. BEST PRACTICES IN FORESTRY MANAGEMENT	<p>Objectives</p> <p>Compile examples of good practices for the implementation of silvicultural actions with conservation or adaptation to climate change objectives</p> <p>Expected results</p> <p>R8. At least 20 best practices cases are identified.</p>	<p>R8. 27 best practices cases have been identified and online.</p>	<p>BBPP are available online. Some of them have been selected as case studies for Manual (B9)</p> <p>Database will be updated on a regular basis</p>

ACTION	FORESEEN IN THE REVISED PROPOSAL	ACHIEVED	EVALUATION
B.5. CRITERIA FOR THE DESIGN AND IMPLEMENTATION OF FOREST MANAGEMENT	<p>Objectives To elaborate in a participatory way a protocol for the design and implementation of silvicultural actions in Natura 2000 forests</p> <p><u>Expected result:</u> R9. A protocol is generated for the design and implementation of silvicultural actions with conservation and adaptation objectives, in forests of the Red Natura</p>	<p>R9. Protocol developed (Annex 5.3)</p>	<p>A set of general criteria and specific measures was debated and agreed.</p> <p>This material has been used for courses and manual B9</p>
B6. DEMONSTRATION ACTIONS	<p>Objectives Implement the proposals of actions B4 and B5 in private states, through pilot management plans and demonstration actions</p> <p>Expected results: R10. Management planning is completed for 900 ha of forests R11. Maintenance and restoration of HIC related to open spaces (7 ha) R12. Recovery or improvement of forestry habitats maturity conditions (4,5 ha) R13. Summary report on the effect of management activities (treatments) on the state of conservation</p>	<p>R10: Management plans already completed for 877,37 ha of forests R11. Management actions completed for 9,43 ha R12. Management actions completed for 3,4 ha R13. Baseline report (situation before silvicultural treatments).</p>	<p>The management plans have been finished, and pilot actions implemented.</p> <p>It has fostered the replication of these plans in other neighbouring forest locations (municipality of Tortosa) and other regions.</p>
B.7. EVALUATION AND MONITORING TOOL FOR FORESTS OF REFERENCE	<p>Objectives To define the indicators and criteria for the characterisation of forests of reference and the protocol for their incorporation in the forests of reference network.</p> <p>Expected results R.14 Software tool for evaluating the conservation status of candidates for inclusion in the Forests of Reference Network.</p>	<p>R.14. Online tool available</p>	<p>Online application allows consultation and data analysis.</p> <p>A complete analysis of Mediterranean old-growth forests needs a more representative network of reference stands.</p>

ACTION	FORESEEN IN THE REVISED PROPOSAL	ACHIEVED	EVALUATION
B8. TRAINING ACTIONS	<p>Objectives</p> <p>Transfer to stakeholders the main lessons learned and project results</p> <p>Expected result:</p> <p>R15 At least 75 RN2000 professionals improve their training</p>	<p>R15. 75 RN2000 professionals attended 3 courses</p>	<p>Three courses were held in which 75 people participated. The courses had a great acceptance that exceeded expectations: 344 applications were received. More editions of these courses are planned during Post Life</p>
B9. TECHNICAL MATERIALS	<p>Objectives</p> <p>Synthesize the lessons learned throughout the project into enduring materials</p> <p>Expected result:</p> <p>R16 Technical manual on management of forests in N2000. Distributed to 1000 recipients</p> <p>R17. Three videos on mature forests, good practices and forest management compatible with conservation accessible online.</p>	<p>R16. "Manual 14. Mediterranean Old-Growth Forests: Characteristics and Management Criteria in Protected Areas" in Spanish and English versions. Distributed to 1.726 recipients.</p> <p><u>R17</u>: Three videos produced, accessible online.</p>	<p>Manual done with a very high degree of collaboration. Postal delivery to 700 contacts of the target audience., plus 1.379 downloads. Videos with 7.533 views in total (YouTube, Facebook, Twitter)</p>
C.1: PROJECT IMPACT MONITORING PLAN	<p>Objectives</p> <ul style="list-style-type: none"> - To evaluate to what extent this capacity-building translates into better management of the forest habitats in the Spanish Mediterranean region. - To evaluate to what extent the project actions contribute to improving the training and awareness of the target audience. <p>Expected results</p> <p>R18. Assessment report on the impact of the project.</p>	<p>R18. Report available online.</p>	<p>169 stands identified, 43 selected as reference</p> <p>26.853 ha under management plans according to LIFE RedBosques</p> <p>247 ha with management measures according to LIFE RedBosques</p> <p>82% of target audience increases management skills</p>

ACTION	FORESEEN IN THE REVISED PROPOSAL	ACHIEVED	EVALUATION
D.1.COMMUNICATION PLAN	<p>Objectives To ensure the transfer of project results to the target audience and to stakeholders.</p> <p>Expected results</p> <p>R.19.1 A project website with 10,000 visits per year.</p> <p>R19.2 Publication downloads: 500.</p> <p>R20 Distribution of six newsletters to all project directory contacts.</p> <p>R.21 Dissemination of project milestones and results to a wide audience.</p>	<p>R19.1 Project Website 18.412 visits /year</p> <p>R19.2. 14.360 document downloads.</p> <p>R20. 7 newsletters have been distributed.</p> <p>R21. 85 reviews in the media.</p>	<p>Thanks to the communication plan and specific dedication of the project technicians, the targeted results regarding communication have been achieved.</p> <p>International audience reached through the Europarc Federation</p>

Replication

A major networking effort has been made with the aim of promoting the implementation of the project results in other administrations and the gradual incorporation of conservation and adaptation criteria to forestry management throughout the Natura 2000 network. This replication objective have been achieved gradually during the execution of the project and will continue after its conclusion, and some results can already be seen.

At present, with regard to Action B3, 13 Public Administrations have been in the process of identifying **stands of reference** following the protocols agreed in the project and further stands of reference are expected to enter the network during 2020 in Castilla y León.

Additionally, some Regional Administrations (for instance, Castilla-La Mancha) are using the protocols to identify stands of reference for assessing favourable conservation conditions in forest habitats of Community interest, required to comply with the Habitats Directive.

Regarding **forest planning**, besides the 872 ha in the pilot forest management plans (Action B6), the municipalities adjacent to the Els Ports Natural Park - where pilot actions took place - are developing management plans for their forests according to the principles put forward by RedBosques. We may highlight the incorporation of conservation and adaptation criteria in Forest Management Plans by Council of Tortosa: new Management Plans cover a surface area of 1,000 ha (Forest number 23 in Tarragona (Regatxol), 590.2 ha, and Forest number 24 in Tarragona (Mola de Catí), 411.6 ha). It is also foreseen other municipal and Generalitat de Catalunya forests will develop new forest management plan according to the project guidelines.

Several forest management plans are currently being drafted on the lines set forth in the Project in other regions: i.e. Zaragoza (3.242 ha), Comunitat Valenciana (553 ha) and Castilla y León (Parque Nacional de la Sierra de Guadarrama (3.053 ha).

Table 15. Area under forest management plans, promoted by varied public administrations following LIFE RedBosques criteria (2017-2019).

Administration	Hectares under forest management plan
CATALUÑA (Parc Natural dels Pors)	872
CATALUÑA (Tortosa Town Council)	1,001
ARAGON (Zaragoza's Environmental Regional Service)	13,791
OAPN (Montes de Valsain)	10,636
Comunidad Valenciana	553
TOTAL	26,853

In total, the management plans which have followed the criteria proposed by RedBosques cover almost 27,000 ha of woodlands in four autonomous regions.

In the Basque Country's case, LIFE RedBosques experience has been used to review the natural resources management plans for five natural parks that fall into SACs. Up to four categories are established (fully protected reserves, scientific reserves, network of micro-reserves /senescence stands, habitat trees) when zoning in order to promote and maintain forest maturity in habitats of Community interest.

Besides de 14ha of demonstrative actions (Action B6.2), **new management actions** have been developed according to the project guidelines: it includes both promoting old-growth attributes in managed forests (21 ha) or setting aside forest reserves (226 ha). Total area under this kind of actions sums up to 247 ha.

Reported actions comprises 7ha with conservation measures in Parc Natural dels Ports, restoration of afforestation in Castellón (14 ha), declaration as Reserve Zone of a stand of reference in Sierra de Guadarrama National Park (180 ha) and declaration as "singular woodland" of a stand of reference in Zaragoza (46 ha).

The Government of Catalonia is funding new actions in monitoring the impact of demonstrative actions performed by RedBosques. In Parc Natural dels Ports 8,867€ have been invested in monitoring Life RedBosques demonstrative actions using drones and photogrammetry.

Policy impact

One of the final objectives of the project is to influence policymakers, which will gradually be achieved as the project results are disseminated; this objective will therefore become visible in the medium term.

On the **national and regional level**, the General Assembly of EUROPARC-Spain provided direct contact with managers responsible for the preservation of biodiversity and forestry management within the national and regional administrations. The project was presented to the Assembly, which has supported the project actions described above providing technicians to take part in them.

With regard to the Project's influence on national legislation we should highlight

1. the publication of a law for the protection of more mature forest stands in Castilla La Mancha (draft under public consultation, pending approval in regional parliament)
2. Catalonia's natural heritage and biodiversity strategy openly refers to LIFE RedBosques, as the core project to use as a starting point when developing a conservation project for mature forests. One of the strategy's objectives is the creation of a free evolving forest reserves network, supported by the participation of forest owners and other concerned sectors.
3. Suggestions for protection of old growth forests have been submitted to Ministry of Agriculture, currently drafting the new National Forest Strategy. Project team has been invited to present the project in the next National Forest Council.

At the **EU level**, a networking effort has been made presenting the Project at the Federación Europarc Annual Congress and at two seminars on the Bio-geographical Process (Italy and Cyprus). The main Project tangible results (protocols for the identification of stands, technical manual) have been uploaded in the portal of the European Commission Bio-geographical Process and in the Europarc Federation website.

As a final result of the project, from the technical manual carried out, two documents of suggestions were prepared for the European strategy of adaptation and the European forestry strategy, both in the drafting process. These documents were sent to the DGEnv and DG respectively, at the request of the EASME (Annex D1.4.2).

Table 16. Summary of Project Replicability Results

B3. REFERENCE SCENARIO FOR MEDITERRANEAN FOREST MANAGEMENT. Administrations actually in the process of identifying reference stands	
1.	Gobierno de Aragon
2.	Generalitat de Catalunya
3.	Junta de Comunidades de Castilla La Mancha
4.	Junta de Castilla y León
5.	Generalitat Valenciana
6.	Gobierno Vasco
7.	Gobierno Foral de Navarra
8.	Junta de Andalucía (red de parques naturales, servicio provincial de Jaén)
9.	Región de Murcia
10.	Xunta de Galicia
11.	Diputació de Girona
12.	Diputació de Barcelona
13.	Diputación Foral de Álava
PLANNING: forest management plans incorporating the project criteria and recommendations	
- Tarragona: forests property of Tortosa Council: MUP 23 Regatxol (590.2 ha) and MUP 24 Mola de Catí (411.6 ha)	
- Zaragoza: 2017 MUPs 100 and 101 Codos (506 ha) and MUP 119 Miedes (1,165 ha). Currently being drafted: MUP 262 Zuera (850 ha) and MUP for the municipality of Cosuenda (1,221 ha).	
- Castellón: MUP CS015 Boalar y Sabinar, Vistabella del Maestrazgo. Forest Management Plan for 553,83 ha	
- Segovia: II Review of the Management Scheme for Monte Matas de Valsaín no. 1 within the CIP for the province of Segovia (3,046 ha) and VIII Review of the Management Scheme for Monte Pinar de Valsaín no. 2 of the CUP (7.22 ha).	
MANAGEMENT: management actions implemented according to project guidelines	
- Tarragona: Finca Millers improvement of forest conservation status (7ha)	
- Castellón: naturalizing of afforestation (14 ha)	
- Segovia: declaration as Reserve Zone of a stand of reference in the PRUG in the Sierra de	

Guadarrama National Park (180 ha).
- Zaragoza: Declaration as “singular woodland” of a stand of reference (46 ha)
POLICIES
Estrategia catalana de Biodiversidad. Includes explicit mention to RedBosques and old growth forests
Legal framework for protecting old growth stands. Junta de Castilla-La Mancha
New EU Forest Strategy. Challenges and management recommendations from RedBosques project
New EU Strategy on Adaptation to Climate Change. Challenges and recommendations from LIFE Redbosques project and experience on adaptation of FUNGOBE/EUROPARC-Spain
EDUCATION
Specific content in the Master’s Degree programme in Protected Natural Spaces at the universities Autónoma de Madrid, Complutense and Alcalá.
COMMUNICATION
Installation of four information panels in agreement with natural park managers.
Document on “frequently asked questions” on old growth forests

6.4. ANALYSIS OF BENEFITS

1. Environmental benefits

a. Direct / quantitative environmental benefits

It was envisaged that by the end of the project at least 5000 ha of forests would be managed according to the project's recommendations regarding preservation of biodiversity and adaptation to change, as a result of the adoption of new management plans. Management Plans for forests on the pilot estates have been completed (872 ha), to which a further 25,981 ha of forests under new management plans may be added, which have been made according to RedBosques' criteria.

Management actions to improve conservation status of forests have been implemented in 14ha in Action B6, and further 21 ha in other areas. Also reserve areas for forest conservation have been declared in 226 ha.

Putting into practice the project results will lead to improvements in the conservation status of forest habitats, at least in the Spanish Mediterranean region, although these results will not be measurable in the short term.

The specific indicators are given below, with values at the project outset, end-of-project target values and their current values.

INDICATOR	STATE-OF-PLAY AT THE BEGINNING OF THE PROJECT PERIOD	STATE-OF-PLAY AT THE END OF THE PROJECT PERIOD	CURRENT STATE OF PLAY
Implementation of the European Forest strategy			
Forest area under management plans according to project recommendations.	-	5,000 ha	26,853 ha
Management pilot actions implemented according to project recommendations.	-	50 ha	260 ha
Natura 2000 sites			
Surface area of forest habitats (9XXX) in LIC within the Mediterranean region with a Favourable conservation status.	357,725	362,725	384,578 ha
Others			
Reference Forests Identified	-	15	169 (43)
Examples of Good Practices	-	20	27
Pilot actions	-	916 ha	872 ha

b. Qualitative Environmental Benefits

The explicit aim of the Project is to enhance capacity-building among Natura 2000 and forestry management professionals, by means of education and training initiatives, of which field trip events and a technical seminar have already been conducted.

The specific indicators are given below, with values at the project outset, end-of-project target values and their current values. Indicators for the execution of actions that have not yet commenced are marked N/A.

INDICATOR	STATE-OF-PLAY AT THE BEGINNING OF THE PROJECT PERIOD	STATE-OF-PLAY AT THE END OF THE PROJECT PERIOD	CURRENT STATE OF PLAY
Information and awareness			
Capacity building			
Networking and other professional training or education			
Networking	No. of individuals trained	240	310
Workshops	No. of individuals trained	90	121
Exchanges	No. of individuals trained	20	21
Online platform	No. of individuals trained	125	123
Short courses	No. of individuals trained	75	75
Technical Material (Handbooks)	No. of individuals trained	1,700	1,726
Enhanced forest management skills among the target audience	-	80%	82%

The Project, in an effort to reach a more general audience, offers a website on which all the project results are freely downloadable, in a bid to promote a new awareness of woodland conservation among landowners, professionals and the general public.

INDICATOR	STATE-OF-PLAY AT THE BEGINNING OF THE PROJECT PERIOD	STATE-OF-PLAY AT THE END OF THE PROJECT PERIOD	CURRENT STATE OF PLAY
General public reached and/or made aware			
Website (mandatory)	-	10,000	64442
Document downloads	-	500	14360

2. Economic benefits

The economic benefits of capacity building accomplished in the project are complex and, in many cases, indirect and difficult to measure. With this in mind, action C1 conducted a study of the economic benefits generated by this project, considering more than the direct impact thanks to the direct employment sustained or generated.

In some forests, income may be generated from alternative harvests other than timber, such as mushrooms, truffles or game, or through tourism or public use. However, part of the economic impact of more highly skilled forestry technicians in the Administration, as far as forest conservation is concerned, may be related to a greater fund-raising capacity for conservation purposes (for instance, through PAC regional development plans) that allow local economies to thrive performing silvicultural works for the preservation of biodiversity or adaptation to climate change.

The implementation of this new forest management paradigm is an opportunity to mobilize economic resources from the public administration. RedBosques has achieved an outstanding multiplier effect for entities that were not part of the project's partnership. At the closing of the project, five regions had invested 160,620 euros in identifying and characterizing mature stands in their territories, following LIFE RedBosques methodology. These projects were executed by companies in the forestry sector through technical assistance contracts, generating an indirect effect on employment and a new job niche.

INDICATOR	STATE-OF-PLAY AT THE BEGINNING OF THE PROJECT PERIOD	STATE-OF-PLAY AT THE END OF THE PROJECT PERIOD	CURRENT STATE OF PLAY
Jobs			
Full-time equivalents (FTE)	-	3.50	3,3

3. Social benefits

The existence of well-preserved forests yields visible social benefits owing to the services these provide. A study of the Project's social and economic benefits have been conducted (Annex C1) and some ideas in this regard can already be put forward:

- Whether privately or publicly owned, forests and woodlands are always the property of landowners, and these enjoy many benefits deriving from forest conservation:
 - The reason for the existence of old-growth stands is, in many cases, due to timber harvesting having become unprofitable many years ago. At such locations, in which economic returns on timber are no longer a realistic option, the value of the forest lies in the services it provides.
 - The sense of attachment to the land and of responsibility toward the conservation of a precious heritage, or a legacy to coming generations, is a value that should not be underestimated.
 - In the current context of climate change and greater frequency of perturbations such as fire or drought, risk management and maintaining forests in favourable conservation conditions are the best methods for the long-term preservation of forests and woodlands.
 -

4. Innovation and demonstration value

The implementation of criteria and materials derived from the Project has brought about innovative approaches to forestry management in Spain and possibly in Europe. At the beginning of the project, there was hardly any experience in identifying old-growth forests in Spain (only in Cataluña) and very little throughout the EU.

The incorporation of conservation criteria, appreciation of woodland stands free from intervention, and the implementation of silvicultural management compatible with the preservation of biodiversity and habitats as the main objective, are new approaches now spreading in the context of the Spanish Administration.

Indeed, the survey conducted to determine the level of training among the target audience prior to the Project (Action C1) showed a poor standard of specific training in forestry management skills geared towards the preservation of biodiversity and adaptation to climate change, and the need for training lies in adaptation to climate change, the evaluation of conservation status and old-growth forest management.

As the results of the final survey shows, this LIFE Project has managed to turn this situation around by enabling the transference of the abundant scientific knowledge available to forestry management practices (see report no project impact, Annex C1).

5. Policy Implications

One of the ambitions of this Project is to influence policy makers in orienting forestry management within Natura 2000 toward conservation and adaptation targets. To this purpose, as mentioned above, direct contacts are maintained with national and regional Administrations in Spain through EUROPARC-Spain. This has led to the replication of Project actions (stands of reference) in several regional Administrations and the inclusion of Project criteria in forestry planning in at least two regional Administrations and one Town Council.

The Project has also been able to influence forestry policies on a European, national and regional scale:

1) On the regional level, the Biodiversity Strategy of Cataluña has been in part inspired by RedBosques findings regarding old growth forests. Castilla y León is preparing a decree to guarantee legal protection of old growth stands, which have been identified following RedBosques protocols.

2) On the national level, recommendations have been submitted to the Ministry of Agriculture, currently drafting the new National Forestry Plan.

Here follows the argumentation of one applicant to the project course (Action B8) currently working at the Ministry: *"The General Sub-Directorate for Forest Policy and the Fight against Desertification of the Ministry for Ecological Transition and the Demographic Challenge, within its competences in defining Spanish forest policy and coordinating with the CCAA in this matter, considers it useful and necessary to know in depth this line of work in relation to the management of stands of mature forests, as a necessary element to take into account in forest management planning."*

3) At the European level, contributions to the European Adaptation Strategy and European Forest Strategy have been submitted to and DGENV DGAgri.

Furthermore, the Project will favour compliance with the Habitats Directive on two main lines: on the one hand, providing tools for evaluating the conservation status of forest habitats as established in Article 6, and on the other hand contributing to the identification of management measures in the Management Plans for Natura 2000 sites.

INDICATOR	STATE-OF-PLAY AT THE BEGINNING OF THE PROJECT PERIOD	STATE-OF-PLAY AT THE END OF THE PROJECT PERIOD	CURRENT STATE OF PLAY
Compliance/enforcement			
Implication of NGOs (mandatory) including interventions supporting EU environmental and/or climate change policies and other stakeholders' policies (at least one is mandatory)			
NGO	0	5	4
Regional authorities	3	11	13
National authorities	1	2	2

ANNEX. LIST OF DELIVERABLES

NAME OF THE DELIVERABLE	ACTION	ANNEX	COMMENT
3 Notice boards	D 1	D1.2.1	Panels explaining the project
Carpetas del proyecto	D 1	-	Folders with project logo
Página web del proyecto	D 1	B1.2.3	Dedicated website
Protocolo para la implementación de bosques de referencia	B 3	B3.3	Protocol for identification of reference stands. Manual and field forms
Plataforma on line "Buenas prácticas de gestión de bosques mediterráneos y conservación"	B 4	http://www.wikiconservacion.org/wiki/index.php/Buenas_pr%C3%A1cticas	Database of good practices on forest management (online)
Protocolo para el diseño e implementación de actuaciones silvícolas en montes de la Red Natura	B 5	B5.3	Criteria for forest management
Herramienta informática	B 7	http://redbosques.creaf.cat	Online tool for managing information on the network of reference stands
Audiovisual "Los bosques maduros"	B 9	B9.2	Video on old growth forests
Audiovisual "Buenas prácticas de medidas de conservación y adaptación en hábitats forestales"	B 9	B9.2	Video explaining pilot actions in Parc Natural dels Ports (Action B6)
Audiovisual "Gestión forestal compatible con la conservación"	B 9	B9.2	Video explaining the main results of the project
Guía técnica "Gestión de bosques mediterráneos en Natura 2000"	B 9	B9.1	Manual on old growth forests and criteria for management
Estudio del impacto socioeconómico del proyecto	C 1	C1.2	Socioeconomic effects of the forestry model proposed in the project
Trípticos de los cursos	B8	B8	Flyer on the courses (B9)
Informe Layman	D 1	D1.2.2	Main results of the project explained to a wider audience
Informe sobre transferibilidad de los resultados del proyecto	D 1	D1.4.3	Lessons learned on transferability
Plan after-LIFE	E 1	E1.3	Actions to be implemented after project end
Orientaciones para la aplicación de criterios de compra verde	E 1	E1.4	Criteria used for green uptake