



LIFE4FIR – Project LIFE18 NAT/IT/000164

“Decisive in situ and ex situ conservation strategies to secure the critically endangered Sicilian fir, *Abies nebrodensis*”

“Report on the LIFE4FIR impact on ecosystem services and conditions” - Action D1.

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REPUBBLICA ITALIANA

REGIONE SICILIANA
ASSESSORATO REGIONALE
DELL'AGRICOLTURA, DELLO SVILUPPO RURALE
E DELLA PESCA MEDITERRANEA


Parco delle Madonie


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Introduction

This report includes an overview of the ecosystem impact of the LIFE4FIR project.

In the first part of this Deliverable, we have defined a general overview of the LIFE4FIR ecosystem impact.

In the second part of this Deliverable, we have defined the questionnaire, the statistical analysis and result comments and conclusions implemented on to 25 stakeholders interested to the *A. nebrodensis* site in the Madonie Regional Park.

At the end of this Deliverable, we have defined a list of main conclusions.

1. LIFE4FIR ecosystem impact analyses

The added value of the LIFE4FIR activities is to respond adequately to the constraints that are afflicting *Abies nebrodensis*: genetic erosion, poor natural regeneration, high rate of inbreeding, concrete extinction risk. The foreseen LIFE4FIR actions, as a whole, are able to lead the threatened *A. nebrodensis* population towards the restoration of a dynamic structure, improving its conservation status, also ensuring the preservation of the *A. nebrodensis* germplasm.

LIFE4FIR falls under the topics 2 aimed at improving the conservation status of habitat types in Natura 2000 sites or species of Community Interest. LIFE4FIR contributes to Priority Target 1 (protecting species and habitats), P.T. 2 (maintain and restore ecosystems), P.T. 5 (combat invasive alien species) and P.T. 6 (help stop the loss of global biodiversity) conserving and restoring nature of the EU Biodiversity strategy for 2020, ensuring application and improvement of existing legislation. LIFE4FIR actions were aimed at enhancing the biodiversity of the highly endangered *A. nebrodensis* species and at improving its conservation status. *Abies nebrodensis* is part of the habitat 9220 Apennine Beech forests with *A. alba* and Beech forests with *A. nebrodensis* of the Natura 2000 site SCI ITA020050.

LIFE4FIR implements perfectly the provisions stated in the EU Convention on Biological Diversity (Council Decision 93/626/EEC) which has 3 main aims:

- conservation and support to biological diversity;
- sustainable use of the components of biological diversity;
- fair and equitable sharing of the benefits from the use of genetic resources;

Implementation of the planned actions led to improve the conservation status of *A. nebrodensis* and produced positive results on the ecosystem services such as genetic resources, cultural services with also social and economic benefits concerning the proper and sustainable management of territory and tourism.

LIFE4FIR addresses completely the EU Convention benefits arising from the use of genetic resources:

- share technology;
- exchange publicly available information on the conservation and sustainable use of biological diversity;
- promote international and scientific cooperation;
- share the results and benefits of biotechnologies from genetic resources.

LIFE4FIR is meant as a method of legislation implementation and seeks to address the problem of the conservation of an endangered species at different levels: by counteracting the factors that disturb the population, helping to restore a dynamic structure (through the widening the genetic diversity in the offspring and targeted reforestation) and the ex situ conservation of the genetic variability with innovative techniques. The project, at the same time, can be considered an instrument to improve the environmental governance through the involvement of experts and stakeholders interested in the conservation of biodiversity at local, national and transnational level, as well as by establishing a sort of reference protocol of tested-and-optimized best practices that can be applied and replicated (and, hence, transferred) to the conservation of other similarly endangered or threatened species.

So, the LIFE4FIR activities contributed to consolidating the knowledge base to assess and develop the biodiversity policy and legislation, according to 92/43/EEC Habitat Directive. The project accomplished and contributed to implement the Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species as a special attention will be given to the presence of biotic introduced stressors in the Fir natural area and in the nursery, and the Regulation (EU) No 511/2014 concerning the access to genetic resources and the fair and equitable sharing of benefits related to the identification of superior Fir genotypes in the project. Lastly, LIFE4FIR activities concerned also indirectly the Directive 2009/147/EC on the conservation of wild birds because the conservation, restoration and implementation of the habitat where the *A. nebrodensis* are living contributes to the better survival of the local protected birds, and marginally the Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment as it a specific project on species and habitats conservation and several environmental indicators of the actions effects will be monitored.

The LIFE4FIR project actions were helpful to improve the local legislation, introducing specific regulatory controls for wild herbivores and more restrictive measures to prevent the introduction of new pathogens and pests or alien plant species in the Madonie park territory.

The implementation of the actions planned in LIFE4FIR improved the conservation status of *A. nebrodensis* and produced positive socio-economic benefits and an improved perception and visibility of ecosystem services of the Madonie area, including genetic resources, cultural services (scientific, educational, leisure and aesthetic), social and economic benefits concerning the proper and sustainable management of the territory and tourism.

The project activities included actions aimed at raising environmental awareness of public institutions, with particular reference to natural historical museums, schools of all levels, and Universities that will be sensitized on the aims of the project, the environmental, cultural and

evolutionary value of the preservation of threatened tree species and biodiversity, the importance of the ecosystems in which *A. nebrodensis* grows. Educational visits at the headquarters of the Park, at the 'Museo dell'Abies Nebrodensis' and the 'Museo Naturalistico F.M. Palumbo', as well as at the site of the natural population of *A. nebrodensis* was promoted. Two thousand (2000) people was directly reached through the dissemination activities of LIFE4FIR on conservation of ecosystems and biodiversity.

One hundred eighty (180) people received professional and skills training. Through a school-job alternation, 150 students were trained on forest and naturalistic activities. Thirty (30) people from social cooperatives received formation of skilled green jobs.

In particular, students were also involved through paths of alternation between school and work: with 4 local (Madonie area) high schools and the EPM – a schoolwork alternation convention was established, in order to train at least 150 students during the whole course of the project. Students received comprehensive training about environmental aspects related to biological and forest activities of the project, but also relatively to the promotion, enhancement and reception of tourists. In addition to specific training related to the scientific field, training was provided regarding also the tourist reception: that could indirectly improve the local working environment, with an increase in the possibility of finding work for students.

Tourism improvement in the Madonie area guarantees consequent benefits for the local economy (farmhouses, the so called 'masserie' and 'bagli', hotels, restaurants, coffee shops, etc.). It is reasonable to expect an increment in Park visits of at least 2000 more tourists per year thanks to the implementation of the LIFE4FIR project.

In addition, the involvement of local workers, local hunters and shepherds associations has been specifically envisaged, in order to produce also an awareness-growth indirect result (i.e. to increase the awareness of the threatened *Abies nebrodensis* and biodiversity conservation) for that part of local population that generally is difficultly reached by a proper scientific and technical information.

Tourism association and local tourism cooperatives specialized in the eco-tourism sector were involved as stakeholders of the LIFE4FIR project, in order to boost the interest for the Madonie Regional Park thanks to the LIFE4FIR activities for nature and biodiversity conservation and to enhance visits of national and international tourists. Tourism experience was also enhanced by the improvement of the networks of information points and visitors' centers: thanks to them LIFE4FIR activities, objectives and goals were promoted, publications and gadgets from the LIFE4FIR and Madonie Regional Park were spread and the sale of locally produced selected quality handmade goods were boosted.

During the project, the Ente Parco delle Madonie (EPM) in collaboration with the Italian Alpine Club (CAI) have collaborated for the improvement of the hiking trail network, in order to realize after the project end an appropriate and functional signposting aimed also at the safe use and at the naturalistic interpretation of the natural areas, with particular reference to that of *A. nebrodensis*: the new trail signs will be relevant for the social enjoyment both from the point of view of hiking and of the enhancement of the protected area, through the promotion of an increasingly interactive approach for visitors who love the natural environment and are worried about its protection.

During the project particularly important was the education of young people to a more active relationship with the territory, discovering its attractions, even with the use of specific signs and panels aimed at the interpretation of the landscape. The works were performed in compliance with the objectives of environmental and nature protection that the Park Authority has inherently in its institutional nature, also using web GIS tools for the use of data through applications normally already supplied with the phones.

During the project, it has been set up a specific establishment of working relationships with professional tour guides and for the rent of tour buses, in order to offer a real and concrete opportunity to disseminate the project results and updates and to promote the Madonie Park. Moreover, being *A. nebrodensis* the symbol of the Madonie, local potters and craftsmen were involved in the preparation of objects showing the Madonie fir and reporting the LIFE4FIR logo. In the "Book and Gift Shop" managed by the EPM in Palermo, tourists and visitors had and will have the opportunity to purchase publications and gadgets from the Parco delle Madonie, together with a selection of quality handmade products produced on the Madonie and the possibility of promoting them.

In addition, the involvement of local workers, local hunters and shepherds associations has been specifically envisaged, in order to produce also an awareness-growth indirect result (i.e. to increase the awareness of the threatened *Abies nebrodensis* and biodiversity conservation) for that part of local population that generally is difficultly reached by a proper scientific and technical information. Local operators were also preferred for purchasing the materials required by the project actions according to the Green Procurement rules.

Specific research carried out suggested that because ecosystem services provide benefits to humans, there are personal and social motivations that incentivise people to engage (or not) in behaviours that protect those services. Therefore, the way people perceive the benefits of ecosystems drives their behaviour, with important ramifications for ecosystem sustainability, especially when human actions and behaviours are strong drivers of ecosystem deterioration. In other words, another socioeconomic benefit of this project is the enhancement of the local community's positive perception of forests as

valuable sources of economic and cultural capital. This in turn can modify their awareness and behaviours towards forests, promoting short term goals – such as forest fire reduction – and long-term goals of environmental sustainability, adaptation to climate change as vital carbon sinks and conservation of biodiversity. These perceptions were evaluated during the project through stakeholder interviews. It is reasonable to expect that perception will not only be improved, but that the stakeholders will also perceive more benefits at the end of the project than they did at the beginning (i.e. improved visibility of ecosystem services).

In order to analyse the perception of ecosystem impact by stakeholders, Certema with the support of all the project partners, has designed, distributed and implemented a statistical analysis and has define comments and conclusions in relation of the following specific questionairres:

1. Questionnaire to 25 stakeholders interested to the A. nebrodensis site in the Madonie Regional Park.

2. LIFE4FIR Stakeholder ecosystem questionnaire

In order to analyse the perception of ecosystem impact by stakeholders, Certema with the support of all the project partners, has designed, distributed and implemented a statistical analysis of the following specific questionnaire:

1. Questionnaire to 25 stakeholders interested to the A. nebrodensis site in the Madonie Regional Park.

The LIFE4FIR questionnaire was filled by the following 25 stakeholders:

1. Tourist hub of Cefalù
2. Punto Qui Gratteri Park
3. Caltavuturo Park point
4. Cordella Association
5. Scillato Park
6. IDIMED Institute
7. Environmental Education Center PALMANANA
8. Michele Spallino – President of the Francesco Minà Palumbo Naturalistic Museum of Castelbuono
9. Ignazio Di Gangi – Director of the Living Plant Germplasm Bank - Ucria (ME)
10. Paolo Girgenti – Director of the Forestry Corps of the Sicilian Region
11. Antonio Mirabella – Naturalistic Guide
12. Michelangelo Gruttadauria – President of the Museum System of the University of Palermo
13. Gianluigi Pirrera - Vice President of AIPIN (Italian Association of Naturalistic Engineering)
14. Emilio Padoa Schioppa – President of the Italian Society of Landscape Ecology
15. Tourist hub of Petralia Sottana
16. Tourist hub of Palermo
17. Collesano Park point
18. Geraci Siculo point
19. Gratteri Park point
20. Isnello Park point
21. Tourist hub of Isnello
22. Botanic Park of Palermo
23. Polizzi Generosa Park point

24. Pollina Siculo point

25. Scillato Park point

Questionnaire

Life4fir

LIFE18 NAT/IT/000164

*“Innovative strategies for the in situ and ex situ conservation of FIR”
delle Madonie (Abies nebrodensis) in Sicily”*

As part of the LIFE4FIR Project “Decisive in situ and ex situ conservation strategies to secure the critically endangered Sicilian fir, *Abies nebrodensis*” - LIFE18 NAT/IT/000164, a survey is conducted to collect information on visitors to the natural area at internal Madonie Park, included in the Natura 2000 network as SAC (ITA 020004) and SPA (ITA 020050), and on the recreational activities carried out therein.

The investigation is divided into different phases. In this first phase, information will be collected directly from the "privileged witnesses" and "stakeholders", the so-called stakeholders, of which you are part, to evaluate the perception of the ecosystem services of the area of interest of the project. The questionnaire will be repeated at the end of the project for comparative purposes.

The methods of the survey that concerns you are as follows: we ask you to respond to this first questionnaire, mainly made up of open questions, based on your technical knowledge in as much detail as possible.

Given the need to contact you again at a later time, the questionnaire will not be anonymous, but the information will be treated with the utmost confidentiality, according to Legislative Decree. 196/2003 (Personal data protection code).

Trusting in your participation in the initiative, which aims to conserve and enhance the *Abies nebrodensis* species and its habitat, we thank you sincerely.

1. In reference to the area in object and its characteristics, what do you think are the main internal strengths for promoting tourist-recreational functions?

- 2. And what are the factors external to the area that can constitute opportunities to promote tourist-recreational functions?**
- 3. What do you think the major internal weaknesses of the area that inhibit its tourist-recreational functions might be?**
- 4. Which ones could constitute external threats or limiting factors?**
- 5. To increase the tourist-recreational function of the area, what are the main aspects to improve?**
- 6. In order to develop concrete proposals to improve the aspects listed above, which local actors (public and private) in your opinion should absolutely be involved?**
- 7. Have you ever heard of “ecosystem services”?**
- 8. By the term “ecosystem service” we mean the multiple benefits provided by ecosystems to community. Which ecosystem services do you think are most related to the site?**
- 9. Do you think it is possible to introduce a form of payment for maintaining the tourist-recreational function through management of the area? if so in what form and to what extent?**
- 10. Is the management as implemented today in the area able to maximize the tourist-recreational function without this going into conflict with the general objectives of protecting the area?**
- 11. Currently, do you think that tourist-recreational use is disjointed, or is it organized into well-defined tourist products? Which?**
- 12. Do you think that the establishment of the Natura 2000 site is having positive repercussions in economic terms?**
- 13. The presence of a Natura 2000 site entails costs but promotes access to economic-financial benefits linked to environmental conservation (e.g. compensation, development programs, services, etc.). Do you agree with this vision? What, in your opinion, have been the most effective incentives to date, if any?**

14. Are you aware of projects financed by the European Community (LIFE programme), aimed at the conservation of nature and biodiversity and, in particular, the protection of *Abies nebrodensis*?

15. Indicate the most significant economic criticality that the Management Plan (or similar instrument) of the site should address?

16. What are the main types of visitors to the area?

17. We ask you to indicate the types of visitors (athletes, hikers, families, etc.)

3. Stakeholder questionnaire result conclusions

The main conclusions from the questionnaire, filled in by 25 stakeholders interested to the A. nebrodensis site in the Madonie Regional Park, related to the ecosystem impact were:

- The Madonie Park is attractive for tourists because is located in an area characterized by a rich historical and cultural heritage, all combined with a natural, unique and satisfying environment.
- Need for greater involvement of local administrators and citizens who live in the Madonie Park in actions that aim to respect and feel part of a territory that preserves one of the protected areas with the greatest biodiversity in the Mediterranean.
- Major weaknesses can be found in the non-sharing of common objectives by all stakeholders (local administrations, various associations, cultural groups, workers in the sector): it would be appropriate to create a "Single Tourist Committee of the Park" which acts as a single promoting body for all promotional initiatives and activities.
- Creation of a unique brand with the creation of various initiatives that can become real tourist products and therefore opportunities for the entire territory.
- Possibility of paying for access to the Park or to some parts of it: if we consider an example of € 5 for daily ticket and the number and day of visits analyzed in the conclusion of people questionnaire, it is possible to consider an economic impact of € 4.000 per year.
- Need to intensify the promotion of initiatives in the Park area via social media with the aim of arousing the curiosity of visitors by making them feel an integral part of an area that combines colours, flavours, art and culture.
- Need to improve access roads and paths in the Park, particularly for families with small children.
- Insertion of small rest areas along the route equipped with images and curiosities (small sensory paths with the scents of local plants) to allow children to get to Abies without feeling the weight of the distance.
- Enhancement of the natural habitat for the maintenance of the biological and genetic diversity of the territory.
- Entrustment of some areas of the Park also to private entities who, united in cooperatives or associations, could deal exclusively with some paths.
- Specialization of the training of park staff aimed at targeted promotion of the territory and at the same time to invite and sensitize visitors to respect nature.

- Improvement of public transport connections.
- Encouraging participation in projects at Regional, National and European level.
- Identification of internal and external economic sources, public and private financing lines (fundraising) and begin to plan concrete actions with the PCM (Project Cycle Management) strategy such as: education campaigns in schools, tasting courses, events promotion and targeted tourist circuits, strategic actions in key sectors to enhance their quality and development