Sixth Mediterranean Forest Week

Committee on Mediterranean Forestry questions, *Silva Mediterranea - Lebanon, 04.04.2019*

Activities of WG4 on Forest Genetic Resources in the Mediterranean Region

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Topics 2013 - 2018

Cost Action FP1202 **"Strengthening conservation: a key issue for adaptation of marginal/peripheral populations of forest trees to climate change in Europe (MaP-FGR)", produced a lot of outputs:**

- Concluded in 2016: **Outputs still continue and a worldwide attention is focused on Marginal populations:**
- **- the web site http://map-fgr.entecra.it/**
- - the special issue on iForest https://iforest.sisef.org/archive/?action=collection&arg=cost_fp1202
- - the special issue with national reports on Annals of Silvicultural Research https://journals-crea.4science.it/index.php/asr/issue/view/210

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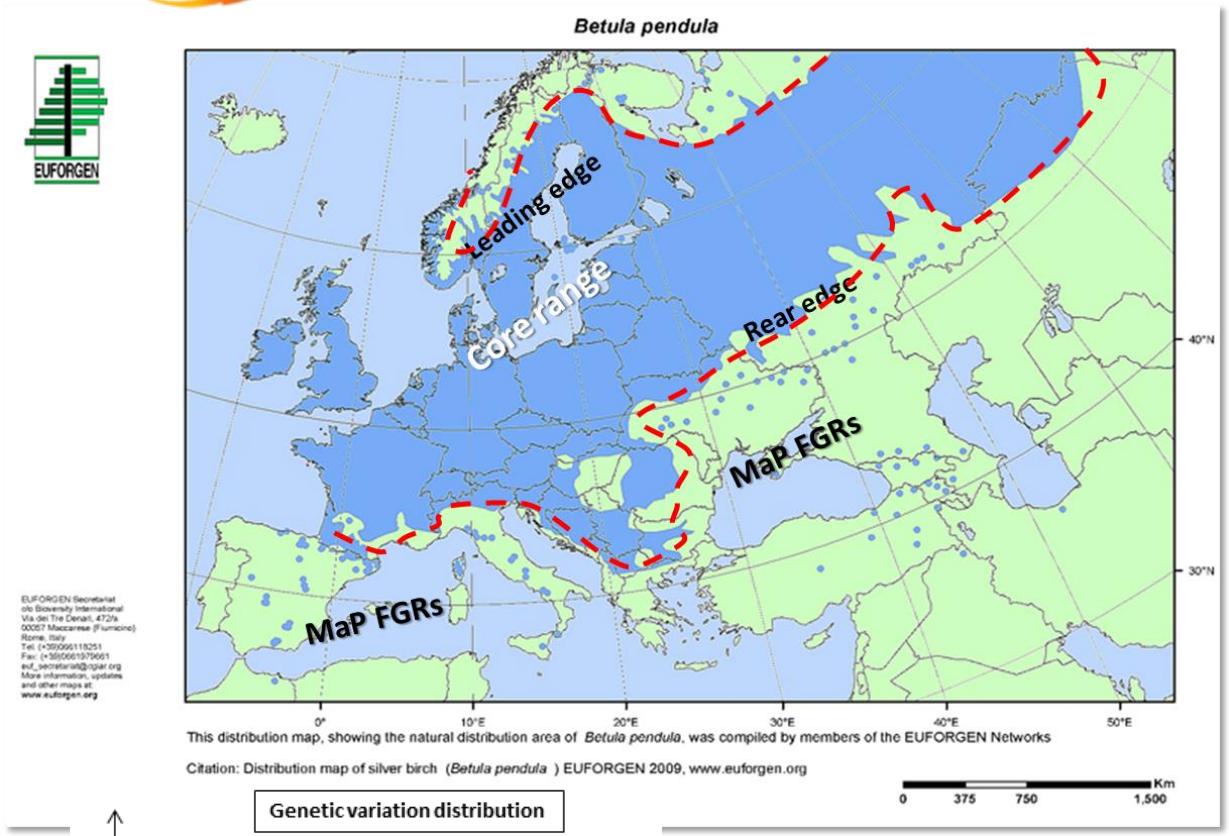
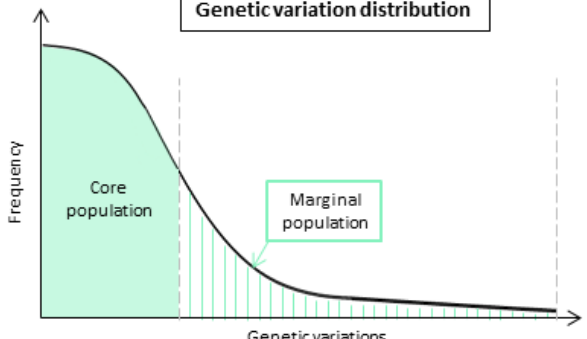


Genetic variation distribution



COST Action 1202 was focal for SM WG4:

- Marginal Peripheral populations (MaPs), may contain valuable adaptive genetic information.
- MaPs are **particularly vulnerable** to anthropogenic influences and current rapid and intense climatic changes
- Their **genetic resources** must be inventoried, monitored, managed and possibly protected.

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- 31 EU countries
- 6 SM Near Neighbour Countries
- 13 SM countries have participated
- 5 specific organizations (Bioversity International, CIHEAM, FAO, EFIMED, IUFRO)

Narrow collaboration of other institutions/projects/partners:

- FAO Silva Mediterranea (http://www.fao.org/forestry/silvamed/en/)

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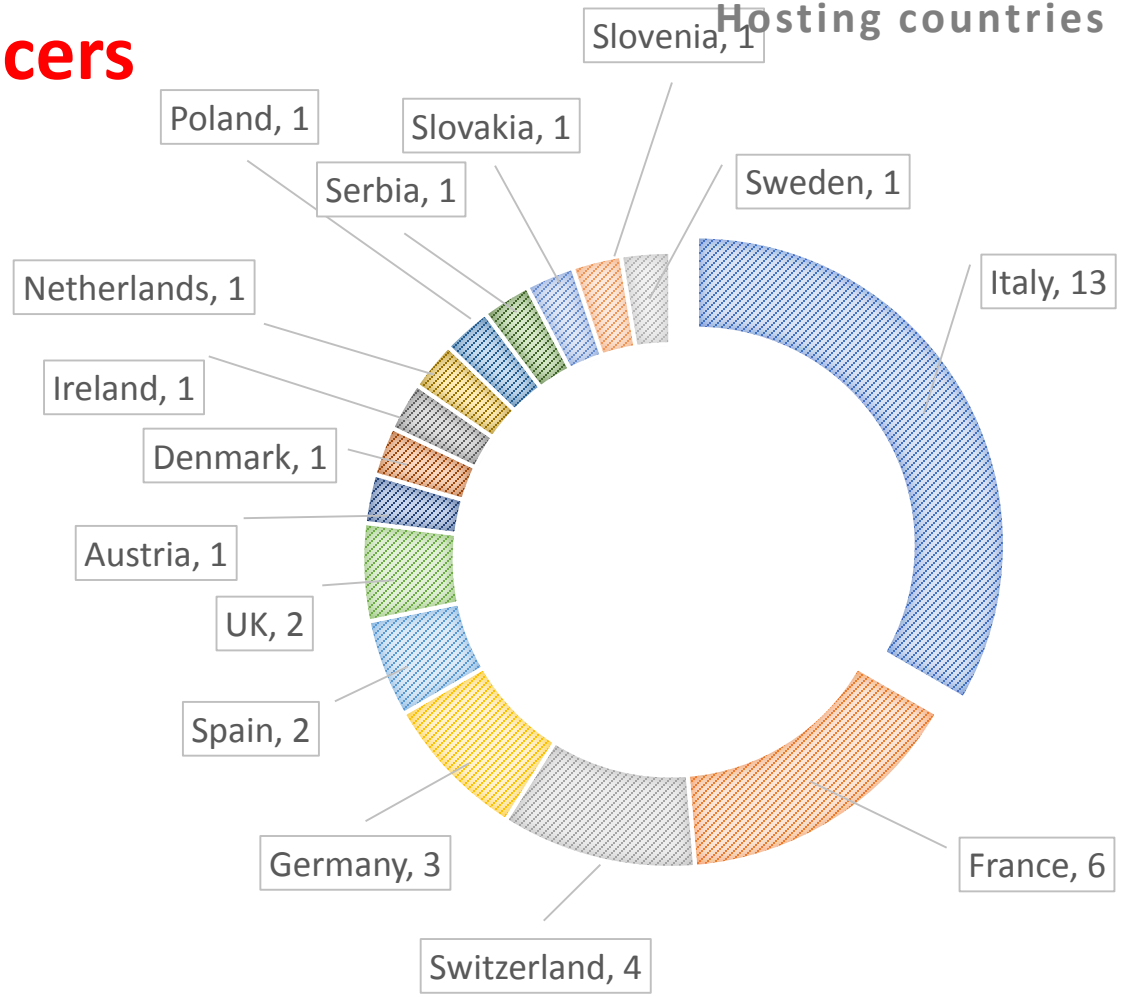
5 Training Schools (2013-2016):
http://map-fgr.entecra.it/?page_id=79

- (**GREECE 2013**)
- (**ITALY 2014**)
- **(SPAIN 2015**)
- (**DENMARK 2016**)
- **(SERBIA 2016)**

80 trainees in total

STSMs (2013-2016): **55 young research officers**



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Important Opinion Paper

Fady et al., 2016. Evolution-based approach needed for the conservation and silviculture of peripheral forest tree populations.
September 2016
Forest Ecology and Management 375:66-75.
DOI: 10.1016/j.foreco.2016.05.015

https://www.sciencedirect.com/science/article/pii/S0378112716302559

http://map-fgr.entecra.it/

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the Action was presented and the **Policy brief** distributed during:

- **COFO 2013**.
- **World Forestry Congress** (Durban, Sept 2015)
- **38th European Forestry Commission** (Geneva, Nov 2015)
- **COP21** (Paris, Dec 2015)

MaP-FGR

FPS COST Action FP1202

Policy Brief

Marginal and peripheral forests: a key genetic resource for enhancing the resilience of European forests to global change

Global environmental change, and particularly climate change, challenges the persistence and sustainability of European forests. Changes in climate may trigger shifts in species ranges and have direct impacts on tree survival, growth and reproduction. The potential for forests to adapt to environmental change depends fundamentally on genetic resources, but this potential is being threatened by a diverse set of pressures including human population growth, forest fragmentation and neglect. Future management strategies must aim to conserve genetic variation, secure and enhance the adaptive potential of populations, and deploy forest reproductive material resistant to future environmental stresses.

Marginal and peripheral tree populations (MaP) constitute valuable forest genetic resources (FGR) for enhancing the resilience of European forests. This is due to their specific adaptations, which are the outcome of evolutionary processes operating over long periods of time in marginal environments. However, at the same time, MaP FGRs are uniquely vulnerable and in urgent need of conservation.

Existing policies recommend sustainable forest management at all scales in order to ensure forest regeneration. Moreover, they stress the need to maintain forest multi-functionality and the delivery of multiple goods and services (ecosystem functioning, timber production, biomass, social and cultural goods and services, etc.).

In this policy brief we aim to provide specific recommendations for the conservation and use of forest genetic resources of marginal and peripheral populations of trees.

Main issue: MaP populations are likely to have developed specific genetic variants and genetic resources found nowhere else. These unique genetic resources could be used to help European forests adapt to the challenges of the 21st century. MaP populations should therefore be of the highest conservation priority.

Marginal and Peripheral forest tree populations grow at the ecological, altitudinal or geographical edges of a species distribution

Context

MaP FGR are a key priority of the Global Plan of Action for Forest Genetic Resources

The FAO Global Plan of Action for the conservation, sustainable use and development of FGR defines its Strategic Priority 7 as "support assessment, management and conservation of marginal and/or range limits forest species populations".

- "Marginal populations should therefore have high priority in global and regional conservation strategies and programmes"
- "Action: Develop guidelines for the inventory and documentation of marginal forest species populations and promote their management and conservation through their integration into conservation networks and by emphasizing the participation of local communities. Support programme development at global and regional levels to assess marginal populations and promote their conservation and evaluation in both *in situ* and *ex situ* conditions".

Problems to be addressed for management of resilient European forests

An EU watchword for forest management in the future is sustainability (New EU Forest strategy, COM(2013)659), which implies ecosystem resilience.

KEY ISSUES

- ✓ Ensure the potential and multifunctionality of forest through systematic sustainable forest management
- ✓ Protect forests and biodiversity from the effects from extreme events (*e.g.* fires, storms, heatwaves), water scarcity, pests: promote actions minimising forest vulnerability to climate change

GUIDELINES

- Need for general investment to enhance resilience, filling objectives for biodiversity conservation, adapting to climate change, protecting forests, etc.
- Enhance resilience and adaptation capacities based on EU strategy on adaptation to climate change COM (2013)216, particularly fulfilling actions 2 and 4
- Fill knowledge gaps, strengthen research, encourage further development of EU database of forest reproductive material and species/genetic diversity distribution maps
- Prioritise and streamline adaptation actions in forest policies
- Enhance conservation of forest genetic resources in species and populations

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The Special Issue of ASR – Annals of Silvicultural Research

On the Regional and National reports

- Forest tree Marginal Populations in Europe - Report on the state of knowledge on forest tree marginal and peripheral populations in **Europe**.
- Report for **Atlantic region**.
- Report for **Baltic region**
- Report for **Continental region**
- Report for **Mediterranean region**.
- Report for **southeastern Europe**.

https://journals-crea.4science.it/index.php/asr/article/view/1586

Special Issue *iForest*

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- **iForest Collections / Special Issues**
- COST Action FP1202 **Strengthening conservation: a key issue for adaptation of marginal/peripheral populations of forest trees to climate change in Europe (MaP-FGR)**

- **Guest Editors**: Fulvio Ducci, Kevin Donnelly

http://iforest.sisef.org/archive/?action=collection&arg=cost_fp1202

Research Articles **Patterns of genetic diversity in European beech (Fagus sylvatica L.) at the eastern margins of its distribution range.** Ciocîrlan E, Sofletea N, Ducci F, Curtu AL .*vol. 10, pp. 916-922* (online: 10 December 2017) - doi: 10.3832/ifor2446-010

Research Articles **Genetic diversity of core vs. peripheral Norway spruce native populations at a local scale in Slovenia.** Westergren M, Bozic G, Kraigher H. *vol. 11, pp. 104-110* (online: 31 January 2018) - doi: 10.3832/ifor2444-011

Research Articles **Some refinements on species distribution models using tree-level National Forest Inventories for supporting forest management and marginal forest population detection.** Marchi M, Ducci F. V*ol. 11, pp. 291-299* (online: 13 April 2018) - doi: 10.3832/ifor2441-011

Research Articles **Regeneration dynamics in the laurel forest: changes in species richness and composition.** Arévalo JR, De Nascimento L, Fernández-Lugo S, Méndez J, González-Delgado G, Balguerías E, Gomes Pereira Cabral E, Fernández-Palacios JM *vol. 11, pp. 308-314* (online: 13 April 2018) - doi: 10.3832/ifor2580-011

Research Articles **Weak isolation by distance and geographic diversity gradients persist in Scottish relict pine forest.** González-Díaz P, Cavers S, Iason GR, Booth A, Russell J, Jump AS. *vol. 11, pp. 449-458* (online: 02 July 2018) - oi: 10.3832/ifor2454-011

Present and future:

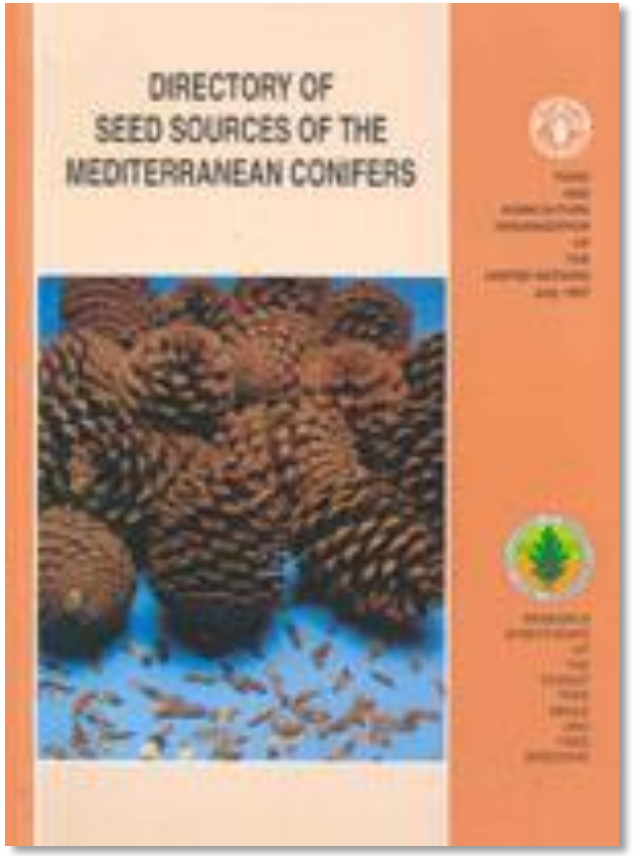
T**he SM Seed Stand Survey, update and revision** after M. Topak (1997), in connection with the Status of Med. FGR.

Prima proposal as a source for hunting funds

Presented proposal for **a IUFRO Task Force**: **Strengthening the Mediterranean nursery system for forest reproductive material procurement to adapt to the effects of the climate change.** Preliminarily approved by IUFRO and to be prepared the full version for ending April. Even if considered a little too regional they consider the proposal a good opportunity and suggest a collegial work is done

Side event in collaboration with Euforgen/EFI during the **2019 Mediterranean week in Lebanon**;

The main Goal is now producing SM Seed Source Directory and revision, in connection with the Status of Med. FGR.



DIRECTORY OF SEED SOURCES OF THE MEDITERRANEAN CONIFERS

This Publication was prepared in 1997 by M. TOPAK of *Silva Mediterranea*

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It is now the due time:

- **to review the Directory,** enlarging it to other forest trees.

- to rebuild and update the database with **descriptors and indicators** describing the state of the populations, their **marginality value, risks** and future uses **in view of climate scenarios.**

A **Template** will be realised following the experience in other projects and spread to the WG 4 partners

Opportunities:
Partnership for Research and Innovation in the Mediterranean Area (PRIMA)

A **consortium** must consist of **at least three institutions with 1 institution** from **Croatia, Cyprus, France, Germany, Greece, Italy,** Luxembourg, **Malta, Portugal**, Slovenia, or **Spain + 1 institution from Algeria, Israel, Jordan, Tunisia, Turkey, Morocco, Egypt, or Lebanon + 1** institution from any of these countries.

One expected impact of this Topic is:

“Valorisation of the local biodiversity that has naturally adapted and show resilience to environmental constraints in the Mediterranean conditions.”

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Key Words: Forest gene resources, nursery, agro-ecosystems, resilience, Mediterranean ecosystem management, climate change, adaptation, seed stands, seed procurement, marginal tree populations, rules, forests

Title: Resilient Forest Genetic Resources for the sustainability of Mediterranean agro-ecosystems (RESILMED-FGR)

•Specific goals and priorities:

a. **Rejuvenating/updating the list of the Mediterranean Forest Basic Materials (FBM)** (Topak, 1997) and establishing a Mediterranean Basic Materials (MBM) database collating information from national Forest Reproductive Materials (FRM) registers.

b. **Designing an efficient network of seed sources**, primarily aimed to preserve FGRs as a foundation of the resilience of rural and forest systems (agro-ecosystems) in the Mediterranean region and to support the Mediterranean forest nursery networks.

c. **Learning from the past and from the experimental tests. That could be another important Topic**

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PRIMA, initial Idea, trasnformed into a Task Force proposal to IUFRO

With the aim to strenghtening the WG4 group in view of future research proposals:

1) **Surveying also broadleaved species** and their residual or marginal populations and their management *in situ*;

2) **Identification of the most endangered populations** and the creation of **decision support tools** to guide their *ex situ* movement or, in extreme cases, their **assisted migration**;

3) **The study of the causes of success and failure** in the Mediterranean region to take into account when preparing the possible models.

Unfortunately, there is **not enough time to conduct preliminary research** and both technical and experimental actions will need to be put in place.

IUFRO Task Force proposal: **Strengthening the Mediterranean nursery system for forest reproductive material procurement to adapt to the effects of the climate change.**

Co0mmnets from referees : The major risk is that the proposal would be intended as a technical topic, while scientific answers have to be supplied and made available to the Mediterranean like context…. Therefore, we need to show a scientific vision of the problem….

Preliminarily approved by IUFRO now we have to prepare a **full version for ending April** [deadline 30 April 2019]. Please, read the draft pre-proposal in the WG4 report.

Even if evaluators considered it as probably too regional, they considered the proposal a good opportunity and suggest a collegial work is done. A **List of Research officer to be involved actively** is required, not only from the geographic area but also from others and from relevant IUFRO Units.

Needed a **prompt feedback by Member States** to approve the pre-proposal and to build a **list of expert researchers and officers** able to collaborate actively at the work proposed.

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Submitted a **side-event proposal** to this 6th MFW EFI (interacting WG4 with Euforgen/EFI)

Title of the side event: "**Developing national strategies for the conservation of forest genetic diversity**"

Date: 1 April 2019

Title of the Presentation for WG4: "Managing FGR in the Mediterranean environment and in the context of the climate change: interacting challenges".

WG 4 on forest genetic resources of FAO Silva Mediterranea

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Context

In a time of changing climate, the genetic diversity of forest tree species may become extremely important to enable the adaptation capacity of forest ecosystems. It is likely that countries will need the genetic diversity now present outside the national borders.

Rationale

Many forest species have their distribution ranges around the Mediterranean Sea; in order to have an effective conservation of species diversity, all countries should be implementing a coordinated conservation strategy. (**therefore connected to the Updating FGR DB**)

Event Objectives and Outputs

Objectives

Define the state of the art in conservation of forest tree species in the Mediterranean

Transfer of knowledge between countries for the development of a circum-Mediterranean conservation strategy.

A last-minute proposal by the WG4 Leader:

The Committee is proposed to push for **forest genetic resources**, totally neglected, in order to develop an **International Treaty** similar to the **FAO International Treaty on Agricultural Genetic Resources and Food**.

A very effective way to obtain the necessary financial support to ensure their *ex situ* protection.

In the entire area of Silva Mediterranea and beyond, the collections and experimental networks are being almost abandoned, while they would be formidable tools to study the effects of the changing climate .

Grazie!

Dr. Fulvio Ducci
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