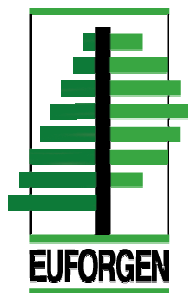




European Information System on Forest Genetic Resources



Jarkko Koskela
EUFORGEN Coordinator
Bioversity International
Maccarese (Rome), Italy

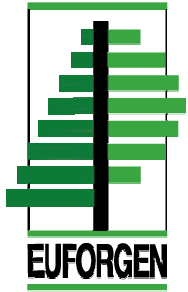


COFO2010, WFW Session on Biodiversity, Rome, 4 October 2010

Improving lives through biodiversity research

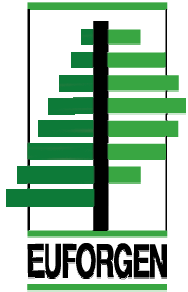
Summary

- European Forest Genetic Resources Programme (EUFORGEN)
- European Information System on Forest Genetic Resources (EUFGIS)
 - Key results of the EUFGIS project
 - EUFGIS Portal
- Assessment and monitoring of forest genetic resources (FGR)



EUFORGEN

- Pan-European programme promoting conservation and sustainable use of forest genetic resources
- Established in 1994 to facilitate the implementation of commitments made by the Forest Europe process
 - Resolution S2: Conservation of forest genetic resources, Strasbourg Conference (1990)
 - Resolution V4: Conserving and enhancing forest biological diversity in Europe, Vienna Conference (2003)
 - Warsaw Declaration (2007)



EUFORGEN

- Member countries (26) (Oct 2010)
- National Coordinators → Steering Committee
- Secretariat (Bioversity International)
- Phase IV (2010-2014) objectives
 1. Promote appropriate use of forest genetic resources as part of sustainable forest management to facilitate adaptation of forests and forest management to climate change
 2. Develop and promote pan-European gene conservation strategies and improve guidelines for management of gene conservation units and protected areas
 3. Collate, maintain and disseminate reliable information on forest genetic resources in Europe

Technical Guidelines

Sycamore (*Acer pseudoplatanus*)

Field map (*A. campestre*)

Black alder (*Alnus glutinosa*)

Italian alder (*A. cordata*)

Silver birch (*Betula pendula*)

Chestnut (*Castanea sativa*)

Common ash (*Fraxinus excelsior*)

Oriental sweet gum (*Liquidambar
orientalis*)

Wild apple and pear (*Malus sylvestris*,
Pyrus pyrastrer)

Black poplar (*Populus nigra*)

European aspen (*P. tremula*)

Wild cherry (*Prunus avium*)

European white oaks (*Quercus
petraea*, *Q. robur*)

Service tree (*Sorbus domestica*)

Wild service tree (*S. torminalis*)

Lime (*Tilia cordata*)

White elm (*Ulmus laevis*)

Silver fir (*Abies alba*)

Norway spruce (*Picea abies*)

Swiss stone pine (*Pinus cembra*)

Aleppo and Brutia pines (*Pinus
halepensis* / *P. brutia*)

Black pine (*P. nigra*)

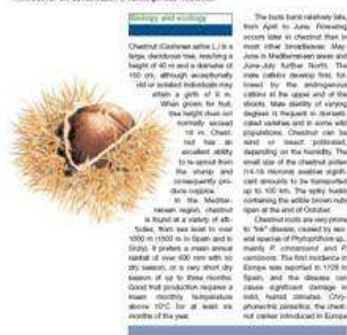
Maritime pine (*Pinus pinaster*)

Italian stone pine (*Pinus pinea*)

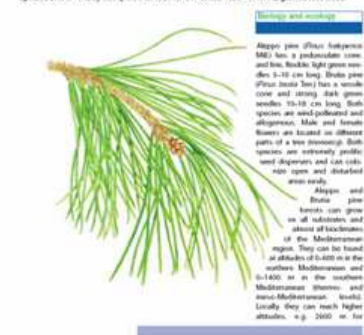
Scots pine (*P. sylvestris*)



These Technical Guidelines are intended to assist those who cherish the valuable chestnut gene pool and its inheritance, through conserving valuable seed sources or use in practical forestry. The focus is on conserving the genetic diversity of the species at the European scale. The recommendations provided in this module should be regarded as a commonly agreed basis to be complemented and further developed in local, national or regional conditions. The Guidelines are based on the available knowledge of the species and on widely accepted methods for the conservation of forest genetic resources.

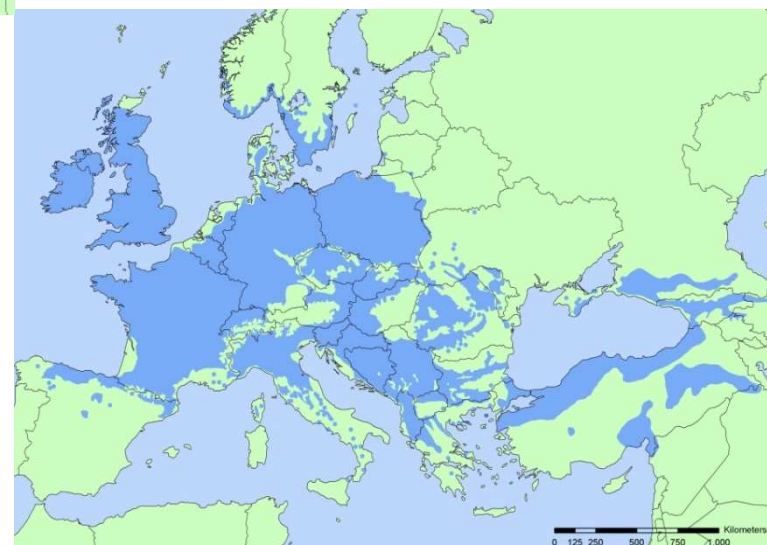
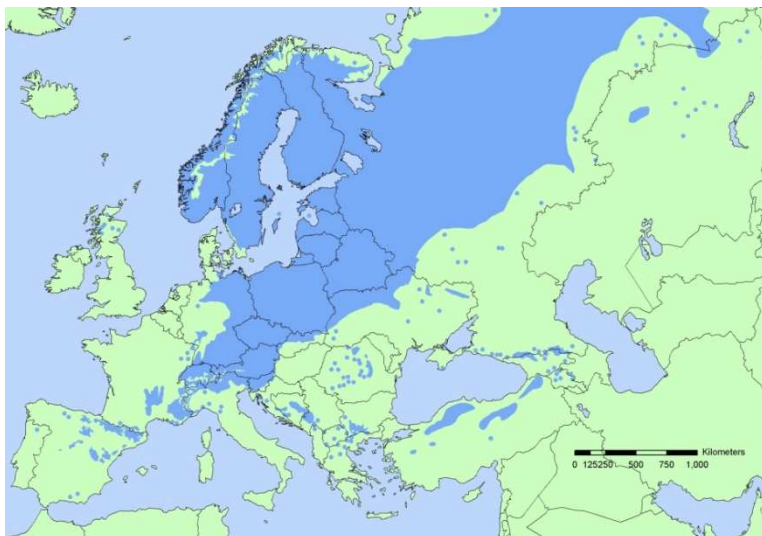


These Technical Guidelines are intended to assist those who cherish the valuable Aleppo pine and Brutia pine gene pools and wish to ensure their sustainability through conserving important seed sources or use in practical forestry. The focus is on conserving the genetic diversity of the species at the European scale. The recommendations provided in this module should be regarded as a commonly agreed basis to be complemented and further developed in local, national or regional conditions. The Guidelines are based on the available knowledge of the species and on widely accepted methods for the conservation of forest genetic resources.

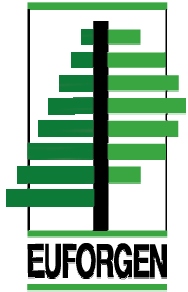


www.euforgen.org

Scots pine (*Pinus sylvestris*)



Sessile oak (*Quercus petraea*)



FGR assessment and monitoring

- Assessment of FGR conservation efforts and promotion of further action
- Indicator 4.6 of the pan-European C&I for sustainable forest management
 - area managed for conservation and utilisation of forest tree genetic resources (*in situ* and *ex situ* gene conservation)
 - area managed for seed production
- State of Europe's Forests 2011 (Forest Europe, UNECE, FAO)

FGR assessment and monitoring: lessons

- European countries have organized FGR conservation in various ways (not a problem as such)
 - Variety of documentation and management efforts
- Most countries use similar conservation approach
 - Networks of reserves, protected areas etc
- What is a 'gene conservation unit' and how it should be managed?
- Reliable assessment of FGR conservation at pan-European level difficult, if not impossible



EUFGIS project



- Project period: April 2007-March 2011
- Co-funded by the European Commission (DG Agriculture and Rural Development) (50%), total budget € 1,1 million
- Seven partners:
 - Bioversity International
 - BFW, Austria
 - State Forest Tree Improvement Station, Denmark
 - INRA, France
 - National Forest Centre, Slovakia
 - Slovenian Forestry Institute, Slovenia
 - Forest Research, United Kingdom
- Implemented in collaboration with EUFORGEN (member and associated countries)



Key results of the EUFGIS project



- A network of National Focal Points in 35 countries



- Pan-European minimum requirements and data standards for dynamic gene conservation units of forest trees
- Four training workshops in 2009
- EUGIS Portal launched in Sep 2010



Minimum requirements

Based on the concept of dynamic gene conservation

- The dynamic nature of forest genetic resources (continuous evolution)
- Active efforts are necessary for effective conservation
- Forest genetic resources rarely achieve an optimum 'adaptedness' to a given environmental conditions

Clarifies the role of protected areas and production forests in gene conservation

- Most protected areas established for habitat or species conservation, no management intervention often allowed
- Gene conservation can be integrated with other management goals of forests



Data standards

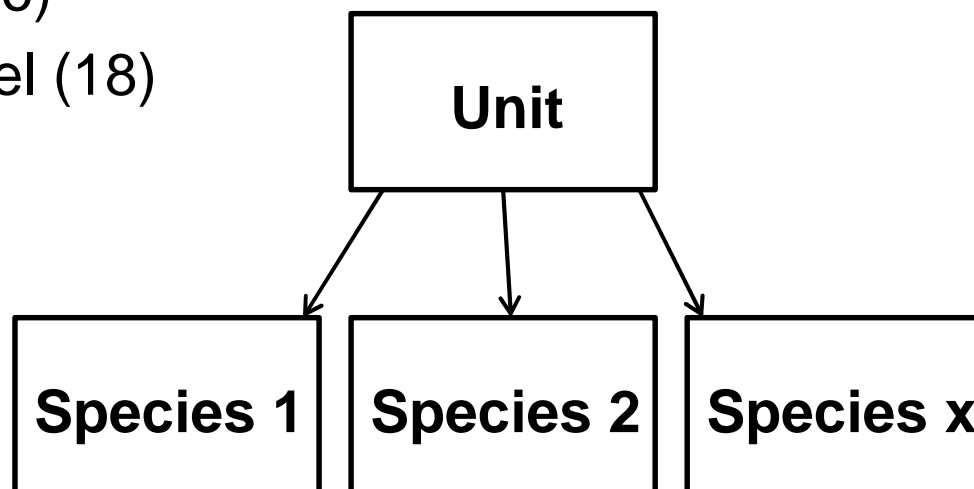


Define the format and accuracy of the data to be entered into the EUFGIS database



Data on the gene conservation units

- Unit level (26)
- Species level (18)




Gene conservation units

- Should have a designated status as genetic conservation areas of forest trees at national level
 - legal status, administrative status or similar arrangements
- Can be located in forests managed for multiple uses, protected areas or seed stands (not in seed orchards)
- Should have a certain minimum size
- Should be managed for genetic conservation of target tree species
- Should be monitored frequently



EUFGIS Portal (<http://portal.eufgis.org>)

**EUFGIS**
European Information System on Forest Genetic Resources

DATA MAPS SEARCH DOWNLOAD UPLOAD

Gene conservation units

Data standards

Data providers

EUFGIS project

Tools

Links

Send feedback

Contacts

Site map


Welcome to EUFGIS

This website provides you with geo-referenced information on the conservation of forest genetic resources in Europe and access to detailed data on dynamic gene conservation units of forest trees in different countries. The data is provided and frequently updated by national focal points based on pan-European minimum requirements and data standards for the units.

EUFGIS serves as a documentation platform linking national inventories on forest genetic resources in Europe. This supports the countries in their efforts to conserve forest genetic resources as part of sustainable forest management, as agreed in the context of Forest Europe, the pan-European forest policy process.

The countries can use EUFGIS for various reporting efforts, such as the State of Europe's Forests and the State of World's Forest Genetic Resources reports. It can also be used for identifying gaps in genetic conservation efforts within the distribution ranges of forest trees, developing gene conservation strategies for forest trees at pan-European level and sampling tree populations for research purposes.

The information system was developed by the EUFGIS project (Establishment of a European Information System on Forest Genetic Resources, April 2007-March 2011) in close collaboration with the European Forest Genetic Resources Programme (EUFORGEN) and its member countries. The EUFGIS project was co-funded by the European Commission through the Council Regulation (EC No 870/2004) on genetic resources in agriculture. In addition to the national focal points, a large group of experts and scientists contributed to the development of the information system.



News

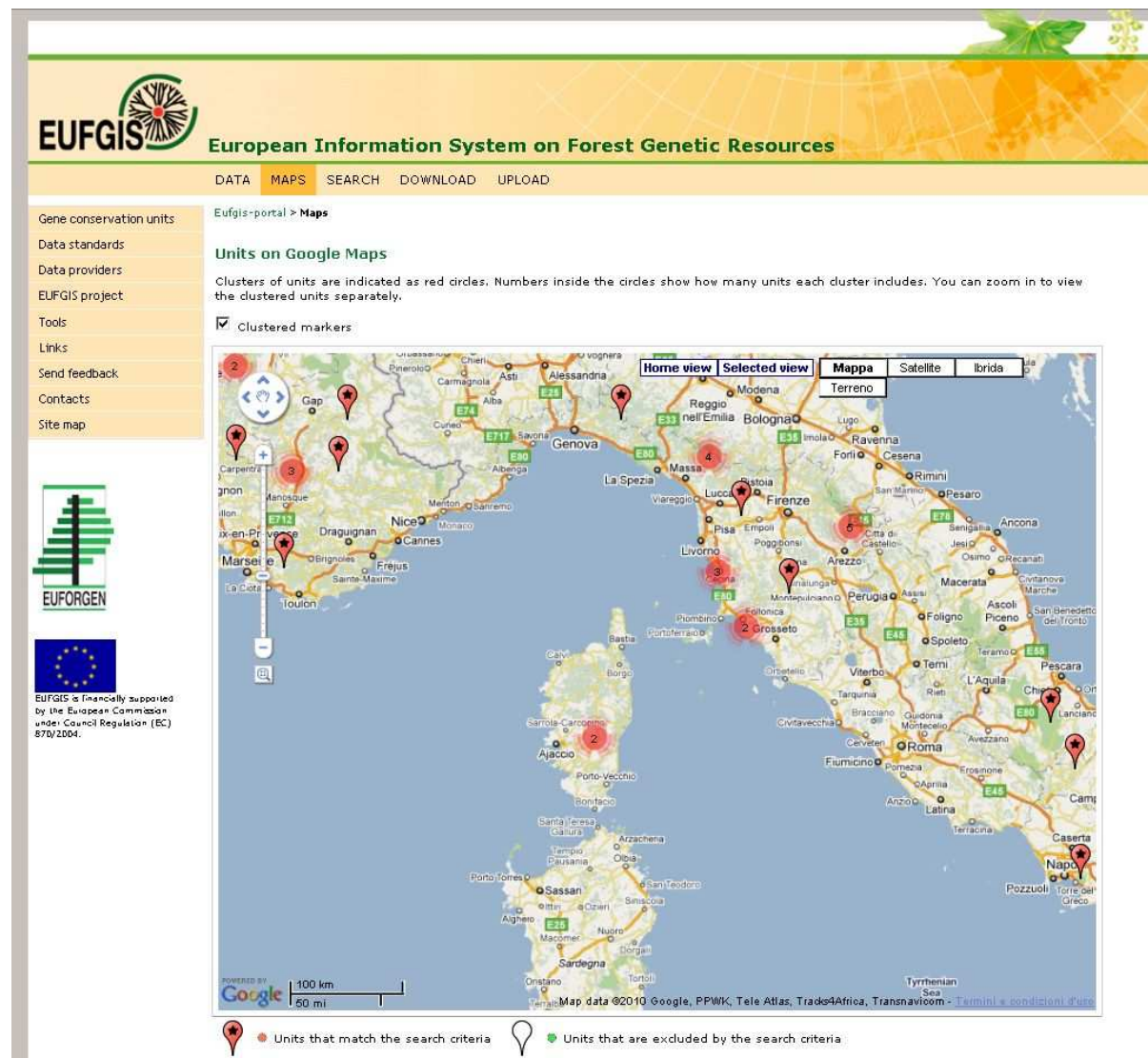
New tool to aid dynamic forest gene conservation (14 Sep 2010) [[more](#)]

Building a sound future for Europe's forest genetic resources (6 Sep 2010) [[more](#)]

As of today, the EUFGIS database contains information on **2325** units and **110** tree species in **31** countries. The units harbour a total of **3076** tree populations.

The EUFGIS portal is hosted by Biodiversity International.

EUFGIS Portal (<http://portal.eufgis.org>)



The screenshot shows the EUFGIS Portal interface. At the top, there is a header with the EUFGIS logo and the text "European Information System on Forest Genetic Resources". Below the header is a navigation bar with links: DATA, MAPS, SEARCH, DOWNLOAD, and UPLOAD. The main content area is titled "Units on Google Maps" and includes a description: "Clusters of units are indicated as red circles. Numbers inside the circles show how many units each cluster includes. You can zoom in to view the clustered units separately." There is a checkbox for "Clustered markers" which is checked. Below this is a map of Italy showing various clusters of units marked with red circles containing numbers. The map includes a scale bar (0 to 100 km) and a legend at the bottom: a red circle with a number for "Units that match the search criteria" and a green circle for "Units that are excluded by the search criteria".



FGR assessment and monitoring



Currently the EUFGIS Portal includes data on 2325 units and 110 tree species in 31 countries (a total of 3076 tree populations)



Gap analysis for plant genetic resources conservation (e.g. Maxted et al. 2008, Diversity and Distributions 14: 1018-1030)

- assessment of genetic conservation efficiency and representativeness
- formulation of truly pan-European gene conservation strategies for forest trees

Better data for international reporting purposes (e.g. State of the World's FGR Report)



FGR assessment and monitoring



The pan-European minimum requirements for the units have increased discussion and action at national level



- Documentation efforts
- Designation of the units
- Management plans

What are we interested in assessing and monitoring?

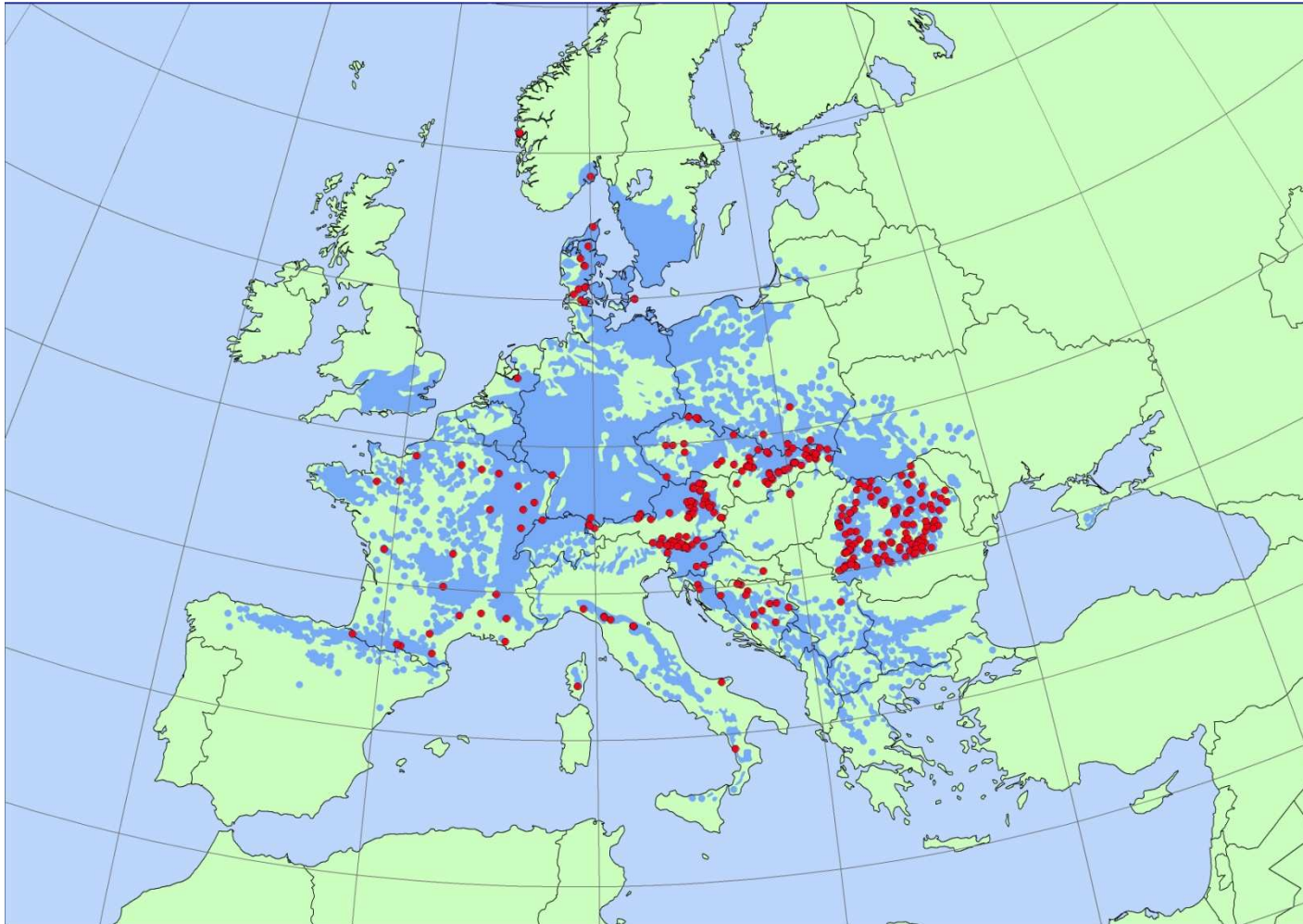
- Geographical coverage of FGR conservation efforts
- Genetic diversity
- Genes
- Adaptive traits



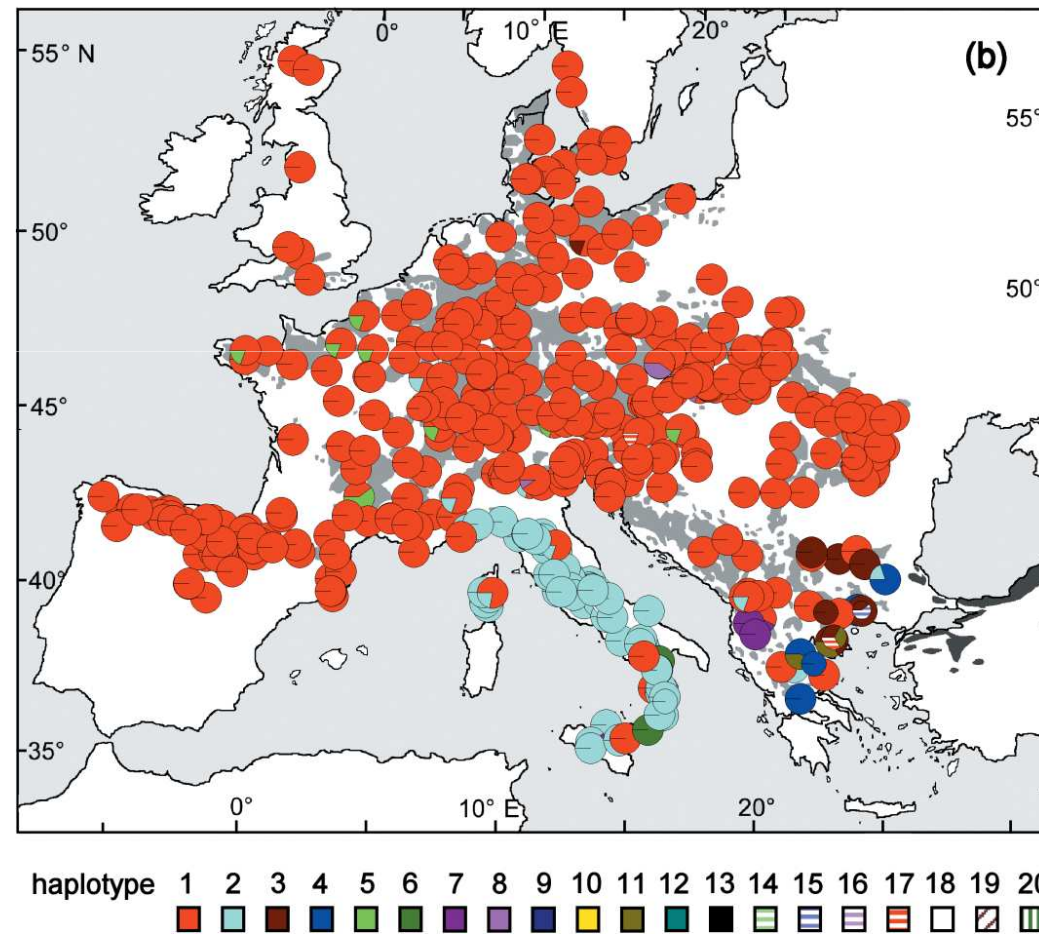
FGR assessment and monitoring

- European beech (*Fagus sylvatica*) is a widely-occurring and economically important tree species
- Provenance trials have shown that beech is a plastic species, i.e. a given seed source can perform well in different sites and climatic conditions
- Large variation among beech provenances across Europe (COST Action E52)
 - Survival
 - Growth
 - Phenology (bud burst, bud set)
 - Drought tolerance
- The impact of climate change on conservation and use of beech genetic resources?

Beech gene conservation units

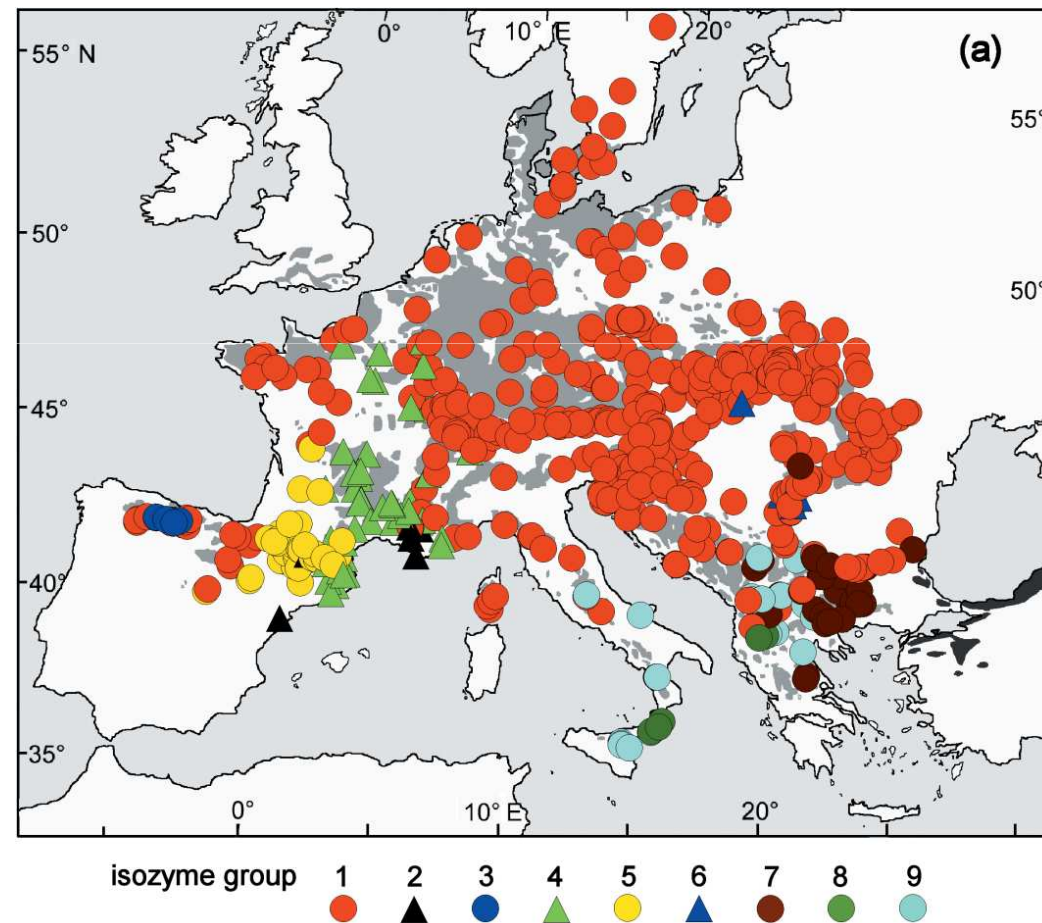


Beech genetic diversity (SSRs)



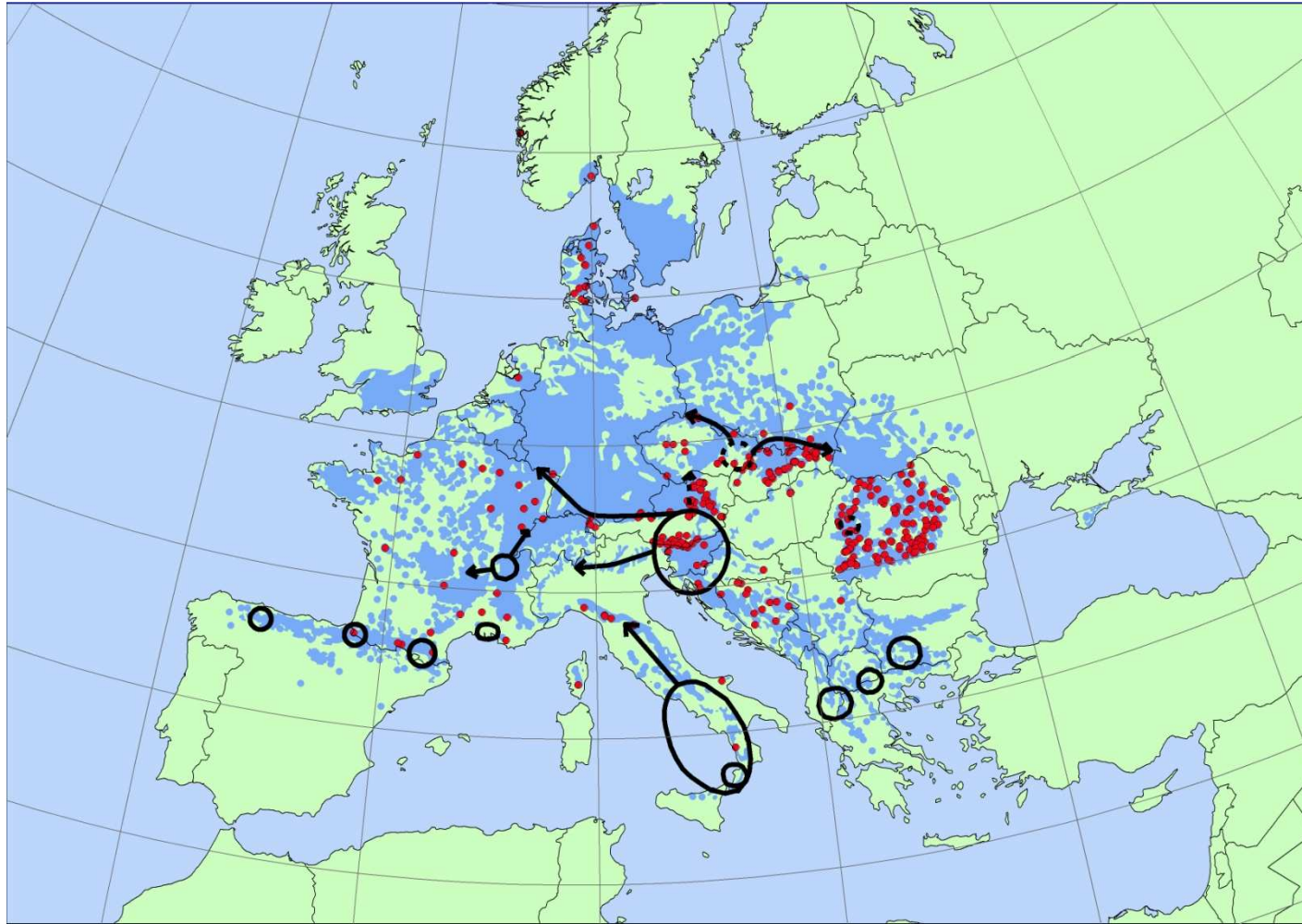
Magri et al. 2006 New Phytologist 171: 199-221

Beech genetic diversity (isozymes)



Magri et al. 2006 New Phytologist 171: 199-221

Units vs refugia areas (Magri et al. 2006)





FGR assessment and monitoring



Development of genetic and genomic resources in Europe offers new opportunities for assessment and monitoring efforts

- Discovery of genes with adaptive significance
- Diversity of genes



EVOLTREE Network of Excellence

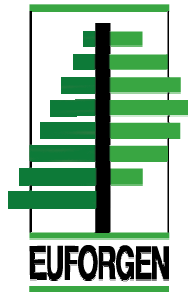
- Databases on genetic diversity of forest trees (11)
- Repository Centre for DNA samples (340,0000)

Beech genetic resources

- 965 populations
- 18 genetic markers

www.evoltree.eu





Future EUFORGEN work

Assessment and monitoring

- Maintenance and further development of the EUFGIS Portal (2011-2014)
- WG to assess gene conservation status of forest trees in Europe and develop of pan-European gene conservation strategies (2011-2012)
- WG to develop genetic monitoring methods for gene conservation units of forest trees (2011-2012)

Conservation and sustainable use of FGR

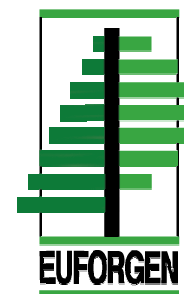
- WG on use and transfer of forest reproductive material in the context of climate change (2011-2012)



Further information



<http://portal.eufgis.org>
www.eufgis.org



www.euforgen.org



www.evoltree.eu