



Consultation on the status of *in situ* conservation of forest genetic resources in Europe and available documentation

Stakeholders' event

Date of the event: 6 April 2017

Location: Rome, H10 Hotel, Via Amedeo Avogadro, 35, 00146 Rome, Italy

Background

GenTree (<http://www.gentree-h2020.eu/>) is an EU-funded research project started in March 2016 with the main goal to provide the European forestry sector with better knowledge, methods and tools for optimising the management and sustainable use of forest genetic resources (FGR) in Europe in the context of climate change and continuously evolving demands for forest products and services. Efficient dissemination and outreach are a priority for the project GenTree in order to raise awareness of a broad spectrum of stakeholders on the importance of improved FGR management practices for increasing the resilience of forest ecosystems to environmental challenges.

To improve the status of conservation of FGR in Europe, GenTree will use next-generation sequencing, high-throughput phenotyping and environmental monitoring to analyze, contribute new data and identify gaps in the current *in-situ* dynamic genetic conservation networks. Related documentation is available in the EUFGIS portal (<http://portal.eufgis.org>), the documentation platform linking national inventories on forest genetic resources in Europe. The portal is maintained by the European Forest Genetic Resources Programme (EUFORGEN, www.euforgen.org) and constantly updated by national focal points in charge of reviewing the data uploaded and supply new information, when available.

The EUFGIS information system supports the countries in their efforts to conserve forest genetic resources. The information system can be used to obtain an updated overview of what is being conserved and for identifying gaps in genetic conservation efforts. It is also a tool for developing genetic conservation strategies for forest trees at pan-European level. Finally, countries can also use EUFGIS for various reporting efforts, such as the State of Europe's Forests and the State of World's Forest Genetic Resources reports.

Up to date, a total of 35 countries have nominated their national focal points to EUFGIS. A Gentree stakeholders' meeting held in Rome, Italy on 6 April 2017, focused on establishing a dialogue with

these focal points. The event had multiple objectives: i) to inform the focal points about knowledge that is going to be generated by GenTree, ii) to understand what are the main constraints limiting the quality of the available FGR inventories and limiting optimal implementation of *in situ* conservation of forest genetic resources in Europe, iii) to update the information in the EUFGIS database and iv) to present new features in the portal, designed to produce more elaborated queries.

The main recommendations for actions to improve conservation efforts resulting from this consultation will constitute an important feedback for both GenTree project and EUFORGEN Programme.



Participants to the Stakeholders event organized by GenTree, involving EUFGIS focal points.

Presentations of the GenTree project

B. Vinceti (Bioversity International) provided an overview of the GenTree project which aims to (i) expand the current scientific knowledge on how genetic diversity, phenotypic trait diversity and environmental diversity co-vary over multiple spatial scales, (ii) generate information on the genetic basis of phenotypic trait variability and plasticity, (iii) characterize *in-situ* and *ex-situ* conservation units.

The initiative focuses on 12 key European forest tree species, which will be subject to a very wide sampling effort across Europe, covering large- and small-scale environmental gradients, to unveil patterns of adaptive variation. The new scientific knowledge generated (phenotypic and genotypic information) will integrate existing information and will support conservation and breeding

activities, in order to make it possible for forest management to fully harness existing genetic diversity. Updated pan-European conservation and breeding strategies, as well as better incorporation of genetic aspects into forest practices and relevant policies, are intended to represent major outcomes of the project. Amongst the outputs of relevance for the practical implementation of conservation efforts will be the development of a protocol for genetic monitoring, to be elaborated in consultation with another ongoing research project, LIFE GENMON (<http://www.lifegenmon.si/>), focused on the same need to produce a standardised monitoring tool and pilot its implementation (see more information on GenTree in Annex 4).

LIFE GENMON (July 2014 to June 2020) is an implementation project within the European LIFE mechanism, combining efforts of six research partners and other experts from three countries (Germany, Slovenia and Greece). The aim of the project is to define optimal indicators and verifiers for monitoring changes over time in genetic diversity in selected species (*Fagus sylvatica*, and the *Abies alba* / *A. borisii-regis* complex) and to implement genetic monitoring for these species. In addition, in order to promote the wide implementation of genetic monitoring, the project has the objective of developing guidelines, a manual and a decision support system, as well as background documents for policy support at the national and European level.



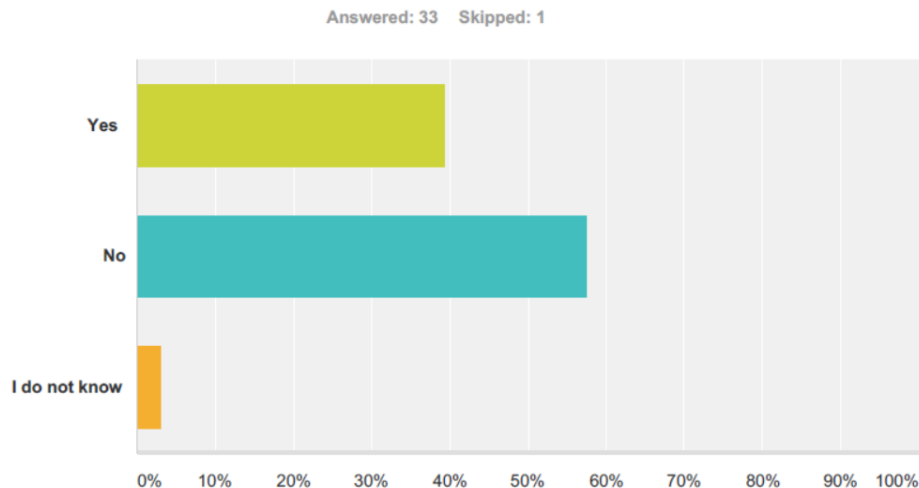
Michele Bozzano explains to the EUFGIS focal points what is new in the EUFGIS portal. As of 11 April 2017, the EUFGIS database contains information on 3419 units and 100 tree species in 35 countries. The units harbour a total of 4355 tree populations.

Presentation of the results of a survey on EUFGIS and FGR inventories across 34 countries

A survey was carried out targeting the 35 EUFGIS focal points from 35 different countries, to obtain an overview on key aspects of FGR *in situ* conservation across Europe. The results provided useful insights for the implementation of the GenTree project and constitute an important contribution to the project from the point of view of Stakeholders. The snapshot would also be useful to define a baseline that could be monitored over time. The results presented here were not meant to be processed statistically, but rather to feed the discussion with Stakeholders. The number of respondents to each question varies. This depends on the different experience of the various countries in feeding the EUFGIS portal. In addition, since the time the EUFGIS portal was established in some countries the focal points responsible to feed it have changed, so for some national focal points it has been more difficult to provide the information requested in the survey.

The EUFGIS focal points are national representatives of European countries, holding responsibilities for maintaining information about FGR conservation units (GCUs) at the national level and entering this information into the EUFGIS information system. The EUFGIS focal points were selected as key Stakeholders of the GenTree project as ideal respondents to the survey. The preliminary results were examined and presented at the meeting highlighting the following key emerging points:

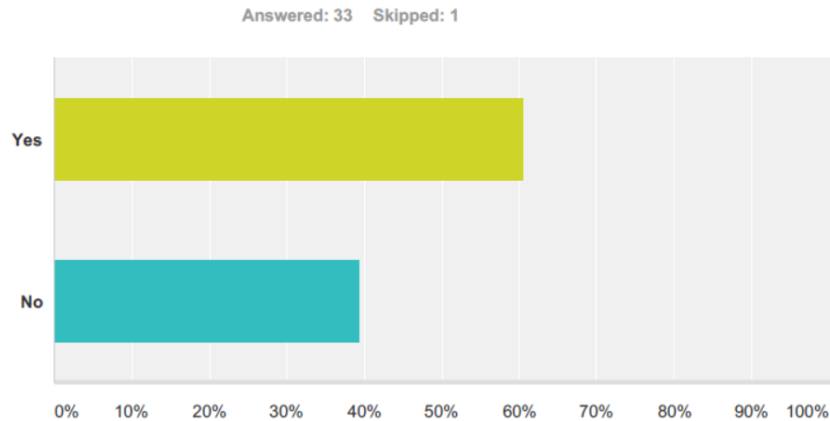
Q1: Since the establishment of EUFGIS, has the approach in identifying genetic conservation units changed in your country?



Q2: If yes, in what way?

- Selection of GCUs is based on Pan-European considerations and not simply-country-based priorities
- Expansion of the number of GCUs
- Increased size
- Awareness has been raised and GCUs have nowadays more visibility, proper formal recognition and trigger country-level interest in FGR conservation (development of strategies)
- Stands not conforming to minimum requirements have been removed

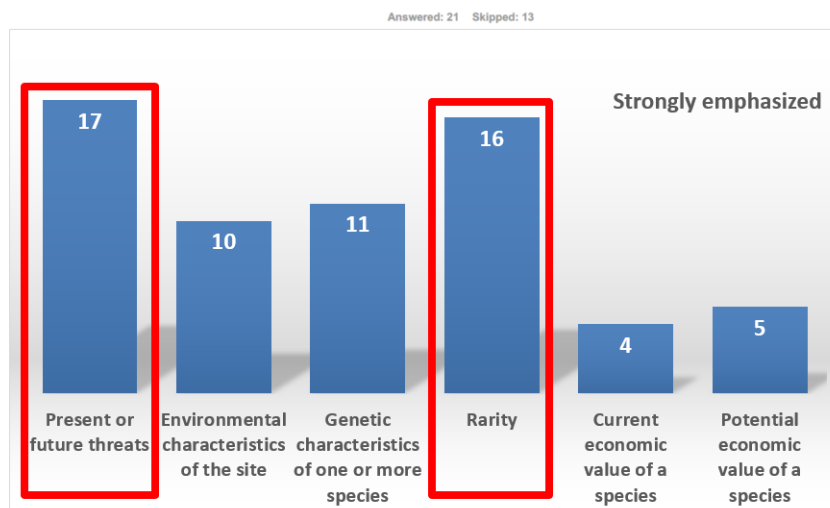
Q3: Does your country plan to establish genetic conservation units targeting new species, presently not conserved in genetic conservation units in your country?



Additional comments

- Expansion to species not yet included in GCUs, especially but not exclusively minor species, rare, endangered species, or new potentially native populations
- Target: at least one unit for each target species
- Revision of the gene conservation programme may lead to further inclusions

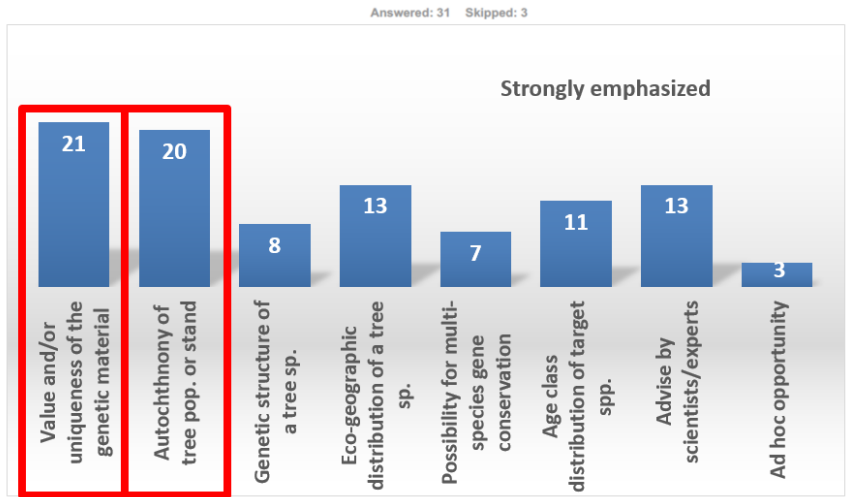
Q4: If yes, what main considerations would guide the selection of new species for in situ conservation?



Additional comments

- Anthropogenic influence on the species
- Emergence of a new disease
- Endemic species, species with marginal distribution, model species
- Biocenotic value

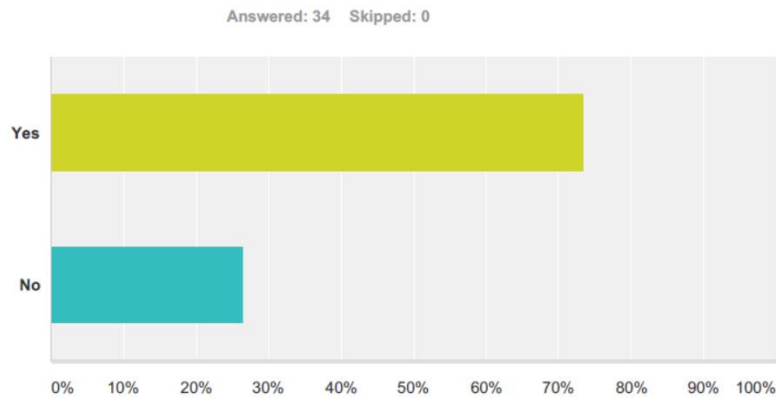
Q5: What considerations are emphasized while establishing in situ genetic conservation units in your country?



Additional comments

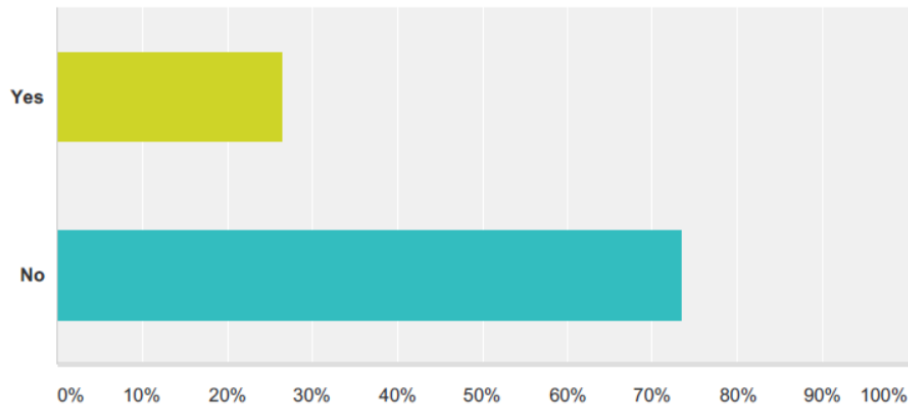
- Analysis of what is within protected areas and see if some stands are suitable for FGR conservation
- Emphasis on genetic information if available
- Size of the area and ownership are important criteria

Q7: Are genetic conservation units visited periodically, to assess the status of the unit or for other purposes?



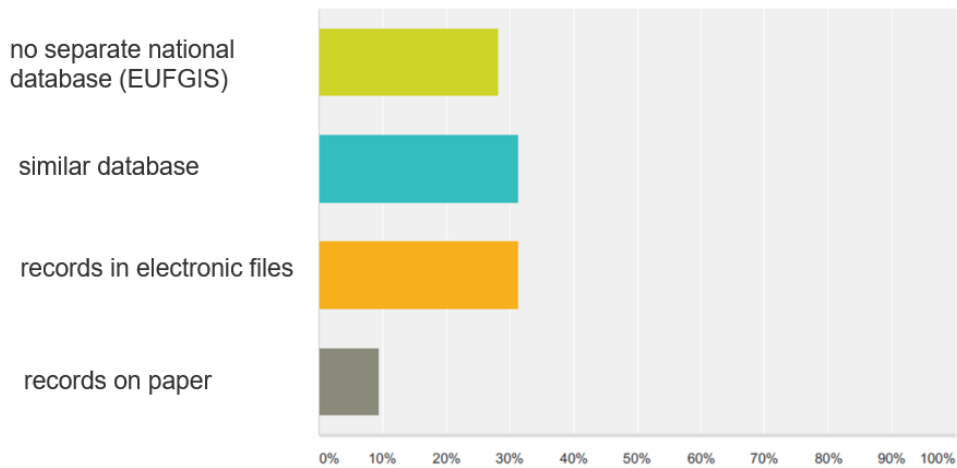
Q11: Do you have a monitoring system in place for the genetic conservation units?

Answered: 34 Skipped: 0



Q16: How is the national database on dynamic genetic conservation units maintained in your country?

Answered: 32 Skipped: 2



It is encouraging that since the establishment of the EUFGIS, the number of GCUs reported in the system has been growing and awareness has been raised. Today, GCUs are more visible and have a proper formal recognition. In some cases, this initiative has triggered country-level interest in FGR conservation and led to the development of FGR conservation strategies.

Another encouraging aspect is that in the majority of countries there is an interest in further expanding the identification, selection and inclusion of GCUs in the system.

The predominant criteria for including new species are the present and future threats and the rarity of the species, while the criteria for selecting a specific location for the establishment of a GCU are the value and uniqueness of the genetic material in the unit and the autochthony of a tree population(s) or stand(s).

The criteria for the identification of GCUs within countries vary based on the characteristics of the species targeted for conservation (e.g., its type of spatial distribution and density).

The units are visited periodically, though the frequency may vary from once/year to once/10 years; usually not all units are visited every year. The main purposes vary and include primarily: checking the conditions of the stand, its health status, the occurrence of regeneration and seed production. According to more than 70% of the respondents, no standard monitoring system is used.



Participants to the meeting, actively contributing to the discussion

Questions after presentations

After the presentation, participants posed some questions. A concern expressed was related to the new work on genetic monitoring envisaged within GenTree, to be implemented collaboratively with the research project LIFEENMON. Considering that in the recent past EUFORGEN had a working group focused on this topic, the question was whether the results of the working group had been considered. It was clarified that the coordinator of the WG on genetic monitoring in EUFORGEN is the same person taking the lead in this research area both within GenTree and LIFEENMON projects, so harmonization of approaches is ensured through continuity.

A question was posed on whether GenTree has included GCUs in its sampling. B. Vinceti clarified that there is only a partial overlap between GenTree sampling sites and GCUs. The sampling effort in GenTree has not been finalized yet, so it is premature to say how many GCUs will be targeted. A final overview will be developed once the sampling is completed. An overall map on the GenTree website will illustrate the location of all GenTree samplings site, colour-coded by species. Despite the incomplete overlap of sampling sites and GCUs, the new information on phenotypic and genotypic diversity produced within GenTree will be highly relevant to further support FGR conservation. GenTree will provide indication on general patterns of within-species diversity across Europe for a large number of species, so it will also support the identification of hotspots of

diversity and areas of particular interest for adaptation which should be recommended for inclusion in the network of GCUs, if not already part of it.

Some countries maintain a much more detailed documentation than what is contained in EUFGIS and some countries use their own databases for reporting. This offers an important point for reflection on how to move into a condition of more homogeneous synthetic reporting across all European countries, as example for the State of European Forests.

Definition of the main constraints to *in situ* FGR conservation

After the presentations and the round of Q&As, the participants were asked to provide their perspectives and response to the two main questions below:

- what are the main constraints for optimal FGR *in situ* conservation (in your country and at European level)?
- what are the main limitations in current quality and quantity of data in FGR inventories (country level)?

Each participant had to provide at least one answer per question and write it on color-coded cards. The content of the cards was then examined collectively and responses were grouped based on their degree of similarity to identify common broad issues. For each question, the key topics that emerged from clustering all responses are reported below, with some detailed answers under each theme. As a second step, participants were asked to indicate what constraints could be addressed with priority by EUFORGEN, directly and indirectly (through associated initiatives), considering the capacity and scope of the Programme. A ranking was attributed to each constraint to be addressed at an international and country level, based on priorities defined by each participant.

Detailed results of the exercise can be found in Annex 6.



Participants to the Stakeholders event organized by GenTree, involving EUFGIS focal points, during a session presenting the new features of the EUFGIS portal and introducing the GenTree project.

Final considerations

The exercise provided useful insights to orient future improvements of the EUFGIS Information system and to guide activities of EUFORGEN and the GenTree project. The way the exercise was structured enabled all participants to provide their perspective, so the results obtained truly reflect all views and provide a comprehensive picture. The positive feedback received after the meeting is a good indicator.

According to the perception of the participants, the main constraints that limit the implementation of *in situ* conservation of FGR in Europe at various levels are the lack of support by policy-makers and the lack of awareness of the importance of FGR conservation amongst decision makers, general public and forest practitioners.

These aspects were considered the most critical ones by the majority of the participants and were flagged as priority themes to be targeted by the EUFORGEN Programme.

The existence of research gaps and the lack of guidelines that translate research findings into management practices were also recognized as important constraints, but they were raised by a lower number of participants and were considered of lower priority.

The analysis of the additional comments contained in the survey carried out before the consultation will allow a more faceted interpretation of responses and will provide extra details to be closely examined. The full report of the survey will be shared with the EUFGIS focal points. It can be used as baseline and a basis for further reflections on how to support and improve existing approaches and databases for *in situ* FGR conservation.

It was suggested to display information about the ongoing research projects involving GCUs (if e.g. used in GenTree project and which units) on the EUFORGEN/EUFGIS websites.

The GenTree project will take the views expressed in this consultation into consideration, and will integrate the opinions manifested in this event with those emerging from other consultations, in order to package its final research outputs in a way that best reflects the needs of Stakeholders.

The EUFORGEN Secretariat will report the views and concerns expressed to the EUFORGEN Steering Committee as a basis for the definition of future programme of work.

Annexes

Annex 1 – Agenda

EUFORGEN/EUFGIS Training Workshop on FGR Inventories and GenTree Consultation on the status of conservation of FGR Rome, Italy, 4-6 April 2017

Tue 4 April	
08:30-09:00	Registration to the workshop
09:00	Opening of the workshop <ul style="list-style-type: none"> • Welcome • Introduction of the participants (round-the-table) • Adoption of the agenda
09:15	EUFORGEN update and introduction to the workshop (Michele Bozzano, EUFORGEN Coordinator)
09:45	Revisiting the basis of the EUFGIS information system <ul style="list-style-type: none"> • Pan-European minimum requirements and data standards for dynamic conservation units of forest trees (M. Bozzano) • Current status of EUFGIS, amount of data, data quality EUFGIS Portal (M. Bozzano) <p>Discussion</p>
10:30	Coffee/tea break
11:00	EUFGIS Intranet traditional functionalities (M. Bozzano) <ul style="list-style-type: none"> • Editing existing data • Uploading new data
11:30	EUFGIS Intranet new functionalities (Nina Lauridsen) <ul style="list-style-type: none"> • Validating species list • Validating ecological zones per species
12:30	Lunch
14:00	Hands-on training (M. Bozzano and N. Lauridsen) <ul style="list-style-type: none"> • All participants editing and entering data in the Information system • All participants validating the list of species occurring in the country
15:30	Coffee/tea break
16:00-17.00	Hands-on training (M. Bozzano and N. Lauridsen) <ul style="list-style-type: none"> • All participants validating ecological zones per species
20.00	Social dinner (Porto Fluviale Restaurant)

Wed 5 April	
09:00	<p>Use of EUFGIS data for reporting purposes</p> <p>The Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources – the upcoming FAO questionnaire and EUFGIS Data (Jarkko Koskela, FAO) (TBC)</p> <p>Indicator 4.6 of the pan-European criteria and indicators for sustainable forest management (M. Bozzano)</p>
10:30	Coffee/tea break
11:00	<p>Pan-European strategy for genetic conservation of forest trees and establishment of a core network of dynamic conservation units (M. Bozzano)</p> <p>New functionalities in the EUFGIS intranet to monitor the progresses in the implementation of the pan-European strategy and manage the network</p>
12:00	Development of a decision support tool for the management of the genetic conservation units network (M. Westergren)
12:30	Lunch
14:00	Further improvement of the EUFGIS Intranet, Portal and EUFORGEN website Plenary discussion
15:30	Coffee/tea break
16:00	Hands-on training and work of individual tasks (continued)
17:00	Wrap-up of the day
	Dinner on your own

Thu 6 April	
09:00	<p>Sharing of information & experiences on relevant projects related to FGR inventories and databases (Barbara Vinceti)</p> <ul style="list-style-type: none"> • GenTree project • Consultation on the conservation status of forest genetic resources • Plenary discussion
10:30	Coffee/tea break
	<ul style="list-style-type: none"> • Future needs to improve FGR inventories to support conservation of FGR in Europe • Recommendations to EUFORGEN • Final considerations on the overall workshop <p>Closing of the workshop</p>
12:30	Lunch
14:00	Transportation to the airport as needed

Annex 2 – List of participants

EUFGIS training workshop, 4-6 April 2017, Rome, Italy

Heino Konrad
Federal Research and Training Centre
for Forests, Natural Hazards and
Landscape
Seckendorff- Gudent-Weg 8
A-1131 Vienna
Austria
(+43) 1878382112
(+43) 6803205994

Mladen Ivankovic
Croatian Forest Research Institute
Dept. of Tree Breeding and Forest Seed
Husbandry
Cvjetno naselje 41
10450 Jastrebarsko
Croatia
(+385) 1 62 73 000
(+385) 1 62 73 035

Oleg Baranov
Forest Institute NASB
Proletarskaya Street 71
246001 Homel
Belarus
(+375) 232 756902
(+375) 232 757373

Josef Frýdl
Forestry and Game Management Research
Institute (FGMRI)
Strnady 136, 252 02 Jíloviště
Czech Republic
(+420) 257 892271
(+420) 257 921444

Alain Servais
Department of Nature and Forests
Forest Tree Seed Center
Z.I d'Aye, Rue de la Croissance, 2
B-6900 Marche-en-Famenne
Belgium
(+32-84) 316597
(+32-84) 322245

Ditte Christina Olrik
Ministry of Environment and Food of
Denmark, Nature Agency
Gillelejevej 2B
3230 Græsted
Denmark
(+45) 72 54 32 97

Dalibor Ballian
University of Sarajevo
Zagrebacka 20
71000 Sarajevo
Bosnia and Herzegovina
(+387) 33812490
(+387) 33892488

Kristel Järve
Forest Department
Ministry of the Environment
Narva mnt 7a
15172 Tallinn
Estonia
(+372) 6260716

Mariya Nikolova-Belovarska
Executive Forest Agency
"Hristo Botev" blvd, 55
Sofia
Bulgaria

Leena Yrjänä
Natural Resources Institute Finland
Latokartanonkaari 9
FI 00790 Helsinki
Finland
(+358-40) 801 5240

Monique Guibert
U.R. Ecosystème Forestiers
Domaine des Barres
45290 Nogent-sur-Vernisson3
France

Michaela Haverkamp
Federal Office for Agriculture and Food
Deichmanns Aue 29
53179 Bonn
Germany
(+49) 22868453385

Sándor Bordács
National Food Chain-safety Office
Department of Forest and
Biomass Reproductive Material
Keleti Karoly utca 24
1024
Budapest
Hungary
(+36) 1 3369300
(+36) 1 3369094

Brynjar Skúlason
Icelandic Forest Service
Gamla gróðrarstöðin, Krokeyri 600
Akureyri
Iceland
(+354) 8998755

Brian Clifford
FSD/COFORD
Department of Agriculture, Food and the
Marine
Agriculture House 3 West, Kildare Street
Dublin 2
Ireland
(+353) 870559530

Maurizio Marchi
Forestry Research Centre
Arezzo
Italy
(+39) 3498387082

Inga Zarina
Latvian State Forest Research Institute
SILAVA
Rīgas iela 111
LV-2169 Salaspils
Latvia
(+371) 29356372

Thierry Palgen
(participating on behalf of Frank Wolter)
Administration de la nature et des forêts
81, avenue de la Gare
L-9233 Diekirch
Luxembourg

Joukje Buiteveld
Centre for Genetic Resources
P.O. Box 47, 6700 AA Wageningen
Netherlands
(+31) 317 48 54 87
(+31) 614325860

Czesław Koziol
The Kostrzyca Forest Gene Bank
Miłków 300
58-535 Miłków
Poland
(+48) 075 7131048
(+48) 075 7131754

Maria Carolina Varela
Instituto Nacional de Investigação
Agrária e Veterinária (INIAV)
Avenida da Republica
2780-159 Nova Oeiras
Portugal
(+351) 929126696
(+351) 214463701

Ecaterina Nicoleta Apostol
National Institute for Research and
Development in Forestry "Marin Dracea"
Voluntari, Eroilor 128, Ilfov
Romania
(+40) 721818827

Andrej Pilipović
Institute of Lowland Forestry and
Environment
Antona Cehova 13
21000 Novi Sad
Serbia
(+381) 21 540 383
(+381) 60 45 88288

Dagmar Bednarova
National Forest Centre Zvolen (NLC)
Forest Research Institute
T.G. Masaryka 22
960 92 Zvolen
Slovakia
(+421) 455314245
(+421) 9029993041

Marjana Westergren
Slovenian Forestry Institute
Večna pot 2
SI-1000 Ljubljana
Slovenia

Eduardo Notivol Paino
Agricultural Research and Technology
Center
Forest Resources Unit
Avda. Montañana 930
50059 Zaragoza
Spain
(+34-976) 716372
(+34-976) 716335

Patrik Olsson
Swedish Forest Agency
Box 344
SE-82 125 Bollnäs
Sweden
(+46) 703778483

Kubilay Özyalçın
Forest Tree Seeds and Tree Breeding
Research Institute Directorate
Ministry of Forest and Water Affairs
06560 Yenimahalle, Ankara
Turkey

Ihor Neyko
Forest Research Station
Maksymovycha str. 39
Vinnytcia 21036
Ukraine
(+038 - 0432) 67 01 85
(+38) 0962736367

EUFORGEN Secretariat
Michele Bozzano

Nina Olsen Lauridsen

Ewa Hermanowicz

GenTree
Barbara Vinceti
Biodiversity International

Unable to attend

Gheorghe Florenta
Str. Lomonosov 38/2. Ap.18.
Chisinau

Moldova

(+373) 69080351

Vlatko Andonovski
University "Ss. Cyril and Methodius",
Faculty of Forestry
Blvd. Aleksandar Makedonski b.b.

1000 Skopje

FYR Macedonia

(+389) 72228824

(+389) 22430927

Paraskevi Alizoti
Faculty of Forestry and Natural
Environment
University Campus, PO Box 238
54125 Thessaloniki

Greece

(+30) 2310 992769

(+30) 2310 992777

Kjersti Bakkebø Fjellstad
Norwegian Genetic Resource Centre

Norway

(+47) 90506661

Andreas Rudow
Swiss Federal Institute of Technology
(ETH)

Universitätstrasse 16
8092

Zürich

Switzerland

(+41) 44 632 32 13

(+41) 44 632 13 58

Jason Hubert
Forestry Commission
Silvan House, 231 Corstorphine Road
EH12 7AT

Midlothian

United Kingdom

(+44-131) 314 6433

Annex 3 - Organizers

The EU project Gentree (<http://www.gentree-h2020.eu/>) has the goal to provide the European forestry sector with better knowledge, methods and tools for optimising the management and sustainable use of forest genetic resources (FGR) in Europe in the context of climate change and continuously evolving demands for forest products and services.

To reach its goal, GenTree will make scientific, technological and implementation breakthroughs in:

- designing innovative strategies for dynamic conservation of FGR in European forests
- broadening the range of FGR used by European breeding programmes
- preparing new forest management scenarios and policy frameworks fully integrating genetic conservation and breeding aspects, to adapt forests and forestry to changing environmental conditions and societal demands.

GenTree focuses on economically and ecologically important tree species in Europe, growing in a wide range of habitats and covering different societal uses and values.

Biodiversity International delivers scientific evidence, management practices and policy options to use and safeguard agricultural biodiversity to attain sustainable global food and nutrition security. Biodiversity International is a member of the CGIAR Consortium, a global research partnership for a food secure future. www.biodiversityinternational.org

Co-organizer

The European Forest Genetic Resources Programme (EUFORGEN) is an instrument of international cooperation promoting the conservation and appropriate use of forest genetic resources in Europe. It was established in 1994 to implement Strasbourg Resolution 2 adopted by the first Ministerial Conference of the FOREST EUROPE process on Conservation of forest genetic resources. EUFORGEN promotes conservation and sustainable use of genetic resources of forest trees in Europe. During the past 20 years, more than 30 European countries have contributed to its work. The EUFORGEN Secretariat is hosted by Biodiversity International. www.euforgen.org

Annex 4 – Information on the Gentree project



OPTIMIZING THE MANAGEMENT AND SUSTAINABLE USE OF FOREST GENETIC RESOURCES IN EUROPE

EUFGIS-GenTree consultation, Rome (Italy)
4-6 April, 2017

Barbara Vinceti, Nina Lauridsen



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101019163

GENTREE | OPTIMIZING THE MANAGEMENT AND SUSTAINABLE USE OF FOREST GENETIC RESOURCES IN EUROPE

General info

Start date: 1st March 2016
Duration: 48 months
Budget: 7.9 million Euro (with a 6.7 Million Euro grant from the European Union)
Project officer: Silvia Gemini, Research Executive Agency (REA)
Coordinator: Dr. Bruno Fady, INRA, France
bruno.fady@inra.fr

Partners

22 research partners from 15 countries

Institut national de la recherche agronomique (INRA), France	Forestry Research Institute of Sweden (Skogforsk), Sweden
Agencia Estatal Consejo Superior de Investigaciones Científicas (CSIC), Spain	Johann Heinrich von Thünen Institute (THÖNEN), Germany
Uppsala Universitet (UU), Sweden	Bavarian Office for Forest Seeding and Planting (ASP), Germany
Aristotle University of Thessaloniki (AUTH), Greece	The Natural Environment Research Council (NERC), Great Britain
European Forest Institute (EFI), Finland	Aleksandras Stulginskis University (ASU), Lithuania
Bioversity International , Italy	INRA Transfert (IT), France
Philipps-Universität Marburg (PUM), Germany	Swiss Federal Institute for Forest, Snow and Landscape Research (WSL), Switzerland
Consiglio Nazionale delle Ricerche (CNR), Italy	Russian Academy of Sciences (RAS), Russia
Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA), Spain	Radiata Pine Breeding Co Ltd (RPBC), New Zealand
University of Oulu (UOULU), Finland	LIECO GmbH & Co KGH (LIECO), Austria
IGA Technology Services (IGATS), Italy	
Norwegian Institute for Bioeconomy Research (NIBIO), Norway	

Investigated species

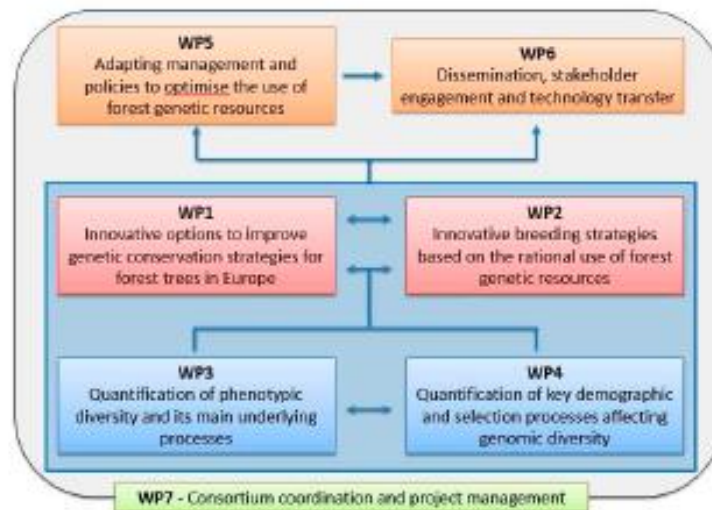
12 economically and ecologically important tree species in Europe, growing in a wide range of habitats

Tree species	Distribution	Major threats to FGR	Ex-situ collections in Europe	Nb in-situ DCUs
<i>Abies alba</i>	Alp, Con	Climate change, habitat loss	AT, DE, FR, GR	318
<i>Betula pendula</i>	Atl, Bor, Con	Habitat loss, grazing	FI, GB, LT, NO, SE	50
<i>Fagus sylvatica</i>	Atl, Alp, Con, Med	Climate change	DE, ES, FR, IT, GB, SE	469
<i>Picea abies</i>	Alp, Bor, Con	Climate change, pests	AT, DE, FI, FR, IT, LT, NO, SE	471
<i>Pinus cembra</i>	Alp	Fragmentation, habitat loss	AT	56
<i>Pinus halepensis</i>	Med	Forest fire	ES, FR, IT, GR	26
<i>Pinus nigra</i>	Alp, Con, Med	Habitat loss, hybridization	DE, ES, FR, GR	145
<i>Pinus pinaster</i>	Atl, Med	Forest fire, pests	ES, FR, IT, GR	42
<i>Pinus sylvestris</i>	Alp, Bor, Con, Med	Climate change	DE, ES, FI, FR, LT, NO, SE	313
<i>Populus nigra</i>	Atl, Alp, Con, Med	Habitat loss, hybridization	DE, ES, FR, IT	30
<i>Quercus petraea</i>	Atl, Con	Pests, hybridization	AT, DE, FR, NO	250
<i>Taxus baccata</i>	Alp, Atl, Con, Med	Fragmentation, habitat loss	ES, IT	56

Outputs

- **New scientific knowledge on phenotypic and genotypic diversity** in 12 major tree species across environmental gradients in Europe to support conservation action.
- Improved **monitoring tools** for practitioners based on genotyping and phenotyping.
- Updated and refined data for information systems of *in situ* and *ex situ* FGR collections
- **Broadened range of FGR used by European breeding programmes**, currently restricted to a few commercial tree species.
- Novel **outreach and science-policy support tools** to better integrate FGR concerns into forest management and better implement relevant international commitments in Europe.

Work packages



Sampling strategy

- Multi-scale tree sampling scheme to study gene flow and the role of genetic diversity and environmental variability in shaping adaptive traits in trees
- 7 species sampled in 10 sites across Europe (from Spain to Lithuania).
- In each site, a pair of populations is selected, located at the two opposite ends of a specific ecological gradient.
- The two populations in a pair consist of 25 trees each and grow under contrasting ecological conditions but are connected by gene flow.
- In addition, 10 plots of 25 trees are investigated for other 5 species.

Sampling protocol



Stakeholders' activities

- Stakeholders' survey
- Madrid meeting on FRM
- Consultation of EUFGIS focal points
- Joint event with LIFE GENNMON to develop a common protocol for genetic monitoring

GenTree stakeholders' event on FRM

- Took place in **November 2016** in Madrid, focused on management of forest reproductive material in light of environmental changes.
- A total of 38 participants attended the event, from associations of forest owners, forest nurseries, representatives of certification schemes, policy-makers and researchers

Achieving impact through strong stakeholders' engagement

EUROPEAN COMMISSION



GenTree is highly committed to achieving impact through the involvement of stakeholders in the definition of the research questions and the identification of targets and objectives to be reached. The project partners are directing efforts towards creating opportunities for consultation with different actors in the forest sector.

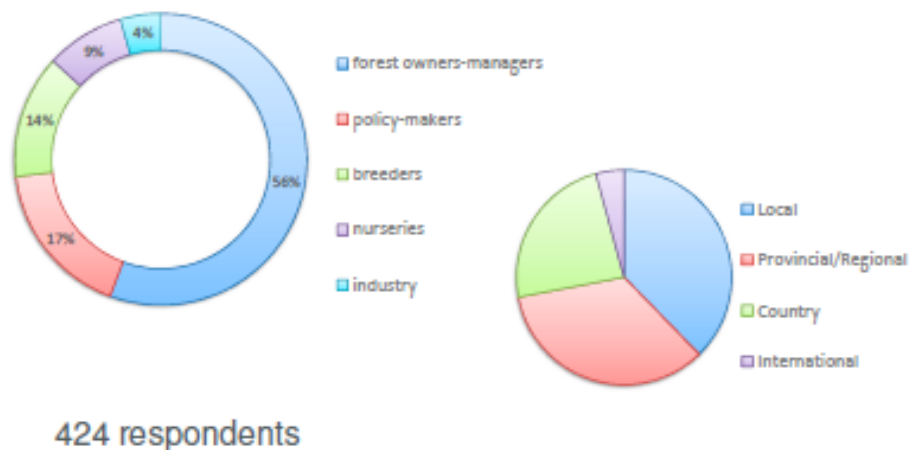
The first GenTree stakeholders' event took place in November 2016 in Madrid, and focused on establishing a dialogue between associations of forest owners, forest nurseries, officers of certification schemes, policy-makers and researchers around a critical theme, that is, the management of forest reproductive material in light of environmental changes, addressed by GENNMON research.

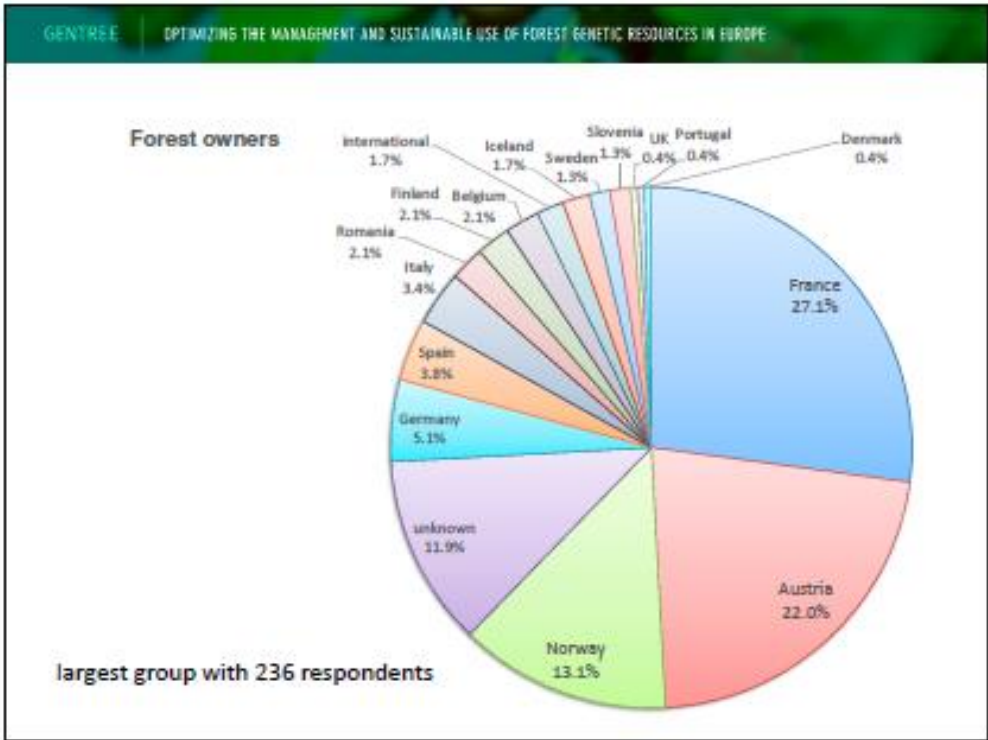
EUROPEAN COMMISSION

Some points from the Stakeholders' event

- o More evidence needed to support choices of FRM: tendency to use artificial regeneration only if natural regeneration fails. Need to compare options (species, provenances)
- o Decisions regarding forest regeneration and FRM sources need to be linked to consideration on forest management (foster adaptation by influencing natural selections and modifying tree genetics).
- o Forest certification schemes tend to favour exclusively natural regeneration. This can pose limitations in potentially speeding up forest adaptation by using better adapted FRM
- o Environmental organizations play a role in influencing the thinking around how forest regeneration should be implemented

International survey on the conservation and sustainable use of FGR (available in 7 languages)





GENTREE | OPTIMIZING THE MANAGEMENT AND SUSTAINABLE USE OF FOREST GENETIC RESOURCES IN EUROPE

GenTree portal

GENTREE | Optimizing the management and sustainable use of forest genetic resources in Europe

HOME ABOUT RESOURCES EVENTS NEWS

The Project

The goal of GenTree is to provide the European forestry sector with better knowledge, methods and tools for optimising the management and sustainable use of forest genetic resources (GUR) in Europe. Read about...

Latest Tweets

Tweets by @GenTreeProject

MC @muelalvarez @gen0114 results from module four will be used in final report/summary, order case study creation @GenTreeProject

Upcoming Events

Workshop for the forest genetic resources community in Austria

Annual GenTree project meeting
6-10 March 2017, Madrid, Spain

<http://www.gentree-h2020.eu/>

Annex 5 – Text of the survey sent to Stakeholders (EUFGIS focal points)



EUFGIS-GenTree survey

This survey is part of a European-wide initiative promoted by the EU-funded project GenTree to collect and analyze knowledge of different Stakeholders on aspects related to conservation and sustainable use of forest genetic resources.

In your capacity of EUFGIS focal point, you have been selected as key Stakeholder of the GenTree project and ideal respondent to the survey, whose preliminary results will be examined and discussed during a dedicated session at the EUFGIS meeting organized on 4-6 April 2017, in Rome (Italy).

The key points emerging from the survey, and the associated discussion planned during the event mentioned above, will inform the implementation of GenTree and will constitute an important contribution to the project from the point of view of Stakeholders.

The survey is quite short, but it may require you to consult colleagues or other experts, so we inserted a feature that enables you to temporarily save your answers at whatever stage of completion you are, and to go back to the survey later, in order to finalize it in a second stage. To save your answers, kindly click *Next* at the bottom of this page.

The deadline for responding to the survey is the 24 March

Thanks in advance for your valuable feedback.

1. Since the establishment of EUFGIS, has the approach in identifying genetic conservation units changed in your country?

- Yes
- No
- I do not know

2. If yes, in what way?

3. Does your country plan to establish genetic conservation units targeting new species, presently not conserved in genetic conservation units in your country?

Yes

No

Please elaborate

4. If yes, what considerations are emphasized while selecting new species for *in situ* conservation?

	Strongly emphasized	Sometimes considered	Not considered
Present or future threats	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Environmental characteristics of the site	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Genetic characteristics of one or more species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rarity	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Current economic value of a species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Potential economic value of a species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

5. What considerations are emphasized while establishing *in situ* genetic conservation units in your country?

	Strongly emphasized	Sometimes considered	Not considered
Value and/or uniqueness of the genetic material within a unit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Autochthony of a tree population(s) or a stand(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Genetic structure of a tree species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Eco-geographic distribution of a tree species	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Possibility for multi-species gene conservation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Age class distribution of target tree species with a unit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Advice by scientists/experts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ad hoc opportunity (e.g. a potential forest area/stand becomes available for gene conservation)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Other (please specify)

6. Do the criteria used for identification of the genetic conservation units vary within your country across the different units?

- Yes
 No

Please elaborate

7. Are genetic conservation units visited periodically, to assess the status of the unit or for other purposes?

- Yes
 No

8. If yes, how frequently?

9. If yes, for what purposes?

10. When and why was the last visit conducted?

11. Do you have a monitoring system in place for the genetic conservation units?

Yes

No

If yes, what parameters are assessed in the monitoring?

12. Do all the genetic conservation units entered in the EUFGIS Information System have a designated status (legal or administrative) that defines them as long-term gene conservation areas or stands?

Yes

No

Please elaborate

13. Do all genetic conservation units have a basic management plan?

Yes

No

Please elaborate

14. Is genetic conservation explicitly recognized as a management goal of all genetic conservation units?

- Yes
 No

Please elaborate

15. Is EUFGIS used for reporting purposes at national level in your country (for example, to provide data for the preparation of the State of European Forests report)?

- Yes
 No

If yes, for what purposes?

16. How is the national database on dynamic genetic conservation maintained in your country?

- We do not have a separate national database, we rely on EUFGIS
 We have a similar database
 We keep records in electronic files (eg excel)
 We keep records in paper files

Other (please specify)

Annex 6 – Results of the consultation

The results presented derive from the views of each individual participant. Participants reported their individual ideas on color-coded cards collected by the organizers and displayed on a wall for sharing and for a collective discussion. The responses were then grouped based on a similarity of the subject defined on the cards. The responses presented below were further synthesized to avoid repetition of topics and to single out the key aspects mentioned.

Question: what are the main constraints for optimal FGR *in situ* conservation in your country and at European level?

Insufficient political support

Main constraint to be addressed at national level: 18

Main constraint to be addressed at European level: 8

- Difficult to find justifications for conservation efforts especially targeting widespread and economically not important species
- Weakness of forest policies at European level
- FGR conservation is not a priority for policy-makers
- Lack of political support and action with regard to FGR conservation
- Lack of legislative framework in place to enforce FGR conservation
- FGR conservation involves restrictions for forest management, therefore support of the state is needed
- Legislative status of conservation units

Lack of awareness

Main constraint to be addressed at national level: 17

Main constraint to be addressed at European level: 8

- Low awareness among policymakers and the general public of the importance of FGR *in situ* conservation
- Lack of awareness at high, political level but also at the level of forest management and forest organizations. This causes the fact that genetic aspects are not always considered relevant in forest management plans and that forest organizations are struggling in the competition with nature/species conservation organizations
- Lack of knowledge and awareness among forestry professionals, at operational level (foresters in the field, forest managers)
- Lack of management power at the small scale level (provincial)
- Limited knowledge on the importance of GCUs

Best practice/ guidelines

Main constraint to be addressed at national level: 10

Main constraint to be addressed at European level: 7

- Pan European *in situ* FGR conservation across borders is difficult
- Lack of harmonization of methods and strategies at international level. At country level, the main constraint is the lack of an effective management system

- Missing dynamic conservation; usually emphasis is given to FGR conservation, not to dynamic management. A management plan should be defined for GCUs and a clear indication of recommended and well-accepted silvicultural treatments should be provided.
- Missing common guidelines for FGR translocation; at the moment pan-European guidelines for FGR transfer are missing and there is a lack of a European tree breeding network
- In some cases, it is difficult to find large autochthonous stands that meet the minimum requirements for *in situ* FGR conservation, so there is a need to develop a new concept for these circumstances.
- The size of the country (eg Luxemburg) could be limiting as only a small fraction of the total forest cover is owned by the State (out of 90.000 ha of forest, 45.000 ha are public forests, and only 10.000 ha are state forests).

Funding

Main constraint to be addressed at national level: 13

Main constraint to be addressed at European level: 0

- Lack of funding and human resources
- Financial resources are directed with priority towards nature protection and this has exhausted the state budget
- Lack of time and staff

Research needs

Main constraint to be addressed at national level: 2

Main constraint to be addressed at European level: 3

- Lack of quality information on biological and genetic aspects that are useful for conservation



Placing on the wall the cards with a feedback on the points for discussion from each individual participant.

Conflicting interests

Main constraint to be addressed at national level: 4

Main constraint to be addressed at European level: 0

- Lack of coordination between different agencies in the management of forest resources
- Issues related to land ownership
- Forestland is fragmented and there is a lack of coordination between different agencies in charge of forest management.
- Conflicts between FGR conservation goals and traditional forest practice
- There is a need to include FGR conservation in forest management plans and cooperate with environmentalists
- There is a tension between conservation objectives and exploitation of forest resources by logging companies
- There is a disconnect between policymaking, science and the operational level in charge of forest management
- There is a lack of active management in GCUs: quite often if stands/populations are registered as *in situ* conservation units, the common perception by environmental agencies and environmental groups is that the stand is protected and no active intervention should be carried out (forest management), even if a sudden decline of the desirable species is observed (e.g. in riparian forests)

Question: what are the main limitations in current quality and quantity of data in FGR inventories (country level)?

Lack of political support

Main constraint to be addressed at national level: 21

- FGR conservation is not a main priority for policy makers, so there is lack of support from decision-makers
- Lack of recognition at policy level
- Undefined legislative framework
- Lack of understanding of the importance of FGR conservation vs management
- Lack of interest in FGR conservation by forest companies (both state and private) and no support by state

Limited funding

Main constraint to be addressed at national level: 20

- Lack of funds and commitment, in the short- and long-term
- Lack of funding to periodically update FGR inventories; there should be a budget allocated for this purpose, but even at ministerial level there is no legislative framework that defines an obligation to report about FGR, therefore resources are not allocated to this objective
- Lack of funding and perspective; sometimes efforts in FGR conservation and management seem not useful; information generated from past experiments like provenance trials and long-term records is not adequately valued and exploited
- Limited financial means and human resources
- Lack of funding gets reflected in the limited amount of conservation units established



Participants actively involved in discussing the priorities emerging from the collective exercise.

- Lack of subsidies for GCUs management
- The lack of funding determines a situation in which FGR inventories are run by NGOs, mainly paid by nature organizations, forest owners and state forest service. Funding is limited and not all areas are inventoried
- In some countries, an aspect that limits capacity to generate good quality data is the location and high number of GCUs units
- Lack of funding to better characterize forest species. The FGR national programme has limited resources but includes many species without breeding programmes. There is not enough funding for molecular analyses to explore the distribution of genetic diversity of conserved species, therefore GCUs are chosen on the basis of suboptimal criteria (e.g., geographic and phenotypic criteria)
- Lack of sufficient funding produces constraints in staff and time dedicated to the implementation of FGR conservation
- Limited time, staff and funding
- Limited funding and number of qualified staff

Lack of awareness

Main constraint to be addressed at national level: 15

- Lack of awareness translates into lack of funding, staff, time and cooperation with other agencies
- FGR conservation is a marginal issue for forest (mainly for private) managers
- Low level of awareness at policy level and in the general public
- Ownership and management: when GCUs were mapped 10 years ago, they were state-owned but now some of the units are privately-owned. This makes it difficult sometimes to get access to the units; maybe a solution could be to pay a rent to private owners so they would accept the idea of conserving and would collaborate more.



Reviewing the results of the exercise leading to a definition of priorities areas for action of the EUFORGEN Programme and the GentTree project, based on the views of the EUFGIS national focal points.

Research gaps

Main constraint to be addressed at national level: 11

- Too limited knowledge on genetic variation within species targeted for *in situ* conservation
- Issues related to land/forest ownership
- Grazing poses a conflict in land use
- Lack of genetic data about the GCUs
- Missing information about the quality of FGR conserved (e.g. research needed on genetic monitoring)

Knowledge management/capacity building

Main constraint to be addressed at national level: 11

- Lack of human resources with adequate profile (capacity building)
- Lack of within-sector connections: most of the FGR information is obtained through unrelated research projects so there is a lack of harmonization and data and results and this causes difficulties in using the knowledge generated
- These projects have different objective, target species, timeframe and duration, methodological approaches
- Difficult access to those managing FGR inventory data. State forests are now using a remote sensing system that has no data at stand level, but there is no access to forest companies data
- Access to data from inventories on species distribution and occurrence of populations (e.g. rare, autochthonous), information on size etc. is not always publicly available
- Lack of exchange of knowledge at several levels (policy-making, research, etc.)
- State of key species/populations is not known. Usually, no information on health conditions of the stand as well as its changes in population structure is gathered during the monitoring process, e.g. decreasing number of trees (and the reason why this happens). There is also a lack of recommendations on ex-situ conservation measures
- In one case, at country level there are not many forest stands considered adequate for conservation purposes (coppice more common than high forest)