

Technical report (2007-2008) of EUFORGEN Phase III²

Jarkko Koskela, EUFORGEN Coordinator
Bioversity International³, Regional Office for Europe, Maccarese (Rome), Italy

2.1. Introduction

The European Forest Genetic Resources Programme (EUFORGEN) is a collaborative programme between European countries to promote conservation and sustainable use of forest genetic resources. It was established in October 1994 as an implementation mechanism for Resolution S2 (Conservation of forest genetic resources) of the first Ministerial Conference on the Protection of Forests in Europe (MCPFE), held in Strasbourg in 1990. EUFORGEN is financed by its member countries and coordinated by Bioversity International in technical collaboration with FAO. The EUFORGEN activities are mainly carried out by experts from the member countries. The EUFORGEN Steering Committee is composed of National Coordinators from all member countries and it has the overall responsibility of the Programme.

During Phase III⁴, EUFORGEN has continued to operate under the MCPFE framework and it has also contributed to the implementation of Resolution V4 (Conserving and enhancing forest biological diversity in Europe) adopted by the fourth Ministerial Conference, held in Vienna in 2003. In 2004, the Steering Committee developed new objectives of the Programme for Phase III:

1. Promote practical implementation of gene conservation and appropriate use of genetic resources as an integral part of sustainable forest management;
2. Facilitate further development of methods to conserve genetic diversity of European forests;
and
3. Collate and disseminate reliable information on forest genetic resources in Europe.

Furthermore, the Steering Committee established a new thematic network (Forest Management Network) to promote better linkages between gene conservation efforts and forest management in Europe. It also restructured the previous species networks into Conifers Network, Scattered Broadleaves Network and Stand-forming Broadleaves Network. The Steering Committee also agreed to strengthen information management on forest genetic resources during Phase III.

This document provides highlights of the EUFORGEN activities during 2007-2008. It also includes a table of financial contributions provided by the member countries and a summary of expenditures during 2005-2008 (Annex 2, page 35). A similar report for 2005-2006 was presented to the Steering Committee at its fifth meeting held in Novo mesto, Slovenia on 22-24 May 2007. Other background documents of the sixth meeting of the Steering Committee provide additional information on the activities related to the MCPFE process and the EUFGIS project.

² Presented at the sixth meeting of the EUFORGEN Steering Committee, Thessaloniki, Greece, 9–12 June 2009

³ With effect from 1 December 2006, IPGRI and INIBAP operate under the name "Bioversity International", Bioversity for short.

⁴ Phase III (2005–2009)

2.2. Progress made during 2007-2008

2.2.1. Implementation of relevant MCPFE Resolutions

The MCPFE Work Programme (2003) for the implementation of the Vienna Resolutions included three specific actions on forest genetic resources, 1) promotion of the conservation of forest genetic resources as an integral part of sustainable forest management and continuation of pan-European collaboration in this area through the EUFORGEN Networks, 2) an international capacity building programme on forest genetic resources to promote conservation and use of biological diversity for development, and 3) a workshop on the role of forest genetic diversity in improving adaptability of forests to climate change.

The fifth Ministerial Conference was held in Warsaw in 2007 and as part of the Warsaw Declaration, the Signatory States and the European Community agreed to ‘maintain, conserve, restore and enhance the biological diversity of forests, including their genetic resources, through sustainable forest management’. A new Work Programme (2008) was subsequently developed and it now includes two specific actions on forest genetic resources that support the follow-up of the Warsaw Conference, 1) promotion of conservation and use of forest genetic resources through EUFORGEN to contribute to the implementation of sustainable forest management in Europe, and 2) establishment of a European information system on forest genetic resources (EUFGIS).

The following sub-chapters provide updates on the implementation of the above mentioned actions during 2007-2008. The workshop on forest genetic diversity and climate change was organized in 2006 and its outcomes were reported in the previous report for 2005-2006. They were also discussed by the Steering Committee in Slovenia in 2007.

2.2.2. Participation in EUFORGEN

As of 31 May 2009, EUFORGEN had a total of 31 member countries providing both technical and financial inputs to the Programme. A country is considered a member of EUFORGEN when it has signed the official Letter of Agreement to join the Programme and/or paid its annual financial contributions regularly. A country is no longer considered as a member of EUFORGEN if it fails to provide its financial contributions for two consecutive years and has not informed the Secretariat on reasons for the delay or when the outstanding contributions will be paid.

The current member countries include Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

The Former Yugoslav Republic of Macedonia, Georgia and Moldova are no longer considered as member countries because their financial contributions have been outstanding for several years and the countries have not informed the Secretariat about their plans to pay these contributions.

During 2007-2008, the Secretariat has continued the dialogue with potential new member countries (e.g. Bosnia and Herzegovina, Latvia, Russian Federation and Ukraine) regarding their interest to

join EUFORGEN. These efforts will be continued and the Secretariat will also inform potential new member countries about the decisions of the Steering Committee regarding a possible Phase IV (2010-2014).

2.2.3. Inputs to the MCPFE process

The Steering Committee recommended in 2004 that EUFORGEN should actively disseminate relevant information on forest genetic resources to policy makers and other stakeholders and, in particular, to the MCPFE process. Subsequently, the Steering Committee, the Secretariat and individual National Coordinators have continued to provide their inputs to the MCPFE Process.

In May 2007, the Steering Committee reviewed relevant parts of the draft Warsaw Declaration and the draft pan-European recommendations for afforestation and reforestation in the context of the Kyoto Protocol. The draft Warsaw Declaration did not include any specific reference to forest genetic resources and therefore the Steering Committee developed a proposal for amending the draft declaration. It also commented on the draft recommendations for afforestation and reforestation. These proposals were then submitted to the MCPFE process at an expert level meeting in June 2007. As a result, the Warsaw Declaration made reference to conserving and enhancing forest genetic resources through sustainable forest management. Another expert level meeting was held in Warsaw in September 2007 to finalise all documents for the Warsaw Conference but the delegates did not reach agreement regarding the draft recommendations for afforestation and reforestation. The MCPFE process finally adopted these recommendations in November 2008 but unfortunately, in the end, not many proposed amendments by EUFORGEN were included in the final document. The main reason for this was that the MCPFE process had developed the recommendations in collaboration with the PEBLDS process (Pan-European Biological and Landscape Diversity Strategy), which adopted the document already in October 2007.

In 2007, the Secretariat was asked by the Liaison Unit Warsaw to contribute to the development of two reports for the Warsaw Conference (*'State of Europe's Forests 2007'* and *'Implementation of MCPFE Commitments. National and Pan-European Activities 2003-2007'*). For the first report, the Secretariat collected data on Indicator 4.6 (Area managed for conservation and utilization of forest tree genetic resources (*in situ* and *ex situ* gene conservation) and area managed for seed production) through the National Coordinators and Focal Points (in non-member countries). Some conclusions based on the two reports are presented later in this document under Chapter 2.4.1. During the Warsaw Conference in November 2007, EUFORGEN publications were distributed to the delegates and a poster was also displayed at the exhibition.

In January 2008, the Liaison Unit of the MCPFE process moved from Warsaw to Oslo, following the hand-over of the coordinating responsibility by Poland to Norway. The new Liaison Unit organized an expert level meeting in Oslo in May 2008 to discuss actions to implement the commitments of the Warsaw Conference. The Secretariat has established good links with the Liaison Unit Oslo. The EUFORGEN Coordinator also participated in the first meeting in Oslo and contributed to the development of a new work programme. After the meeting, the new MCPFE Work Programme was finalized including the two actions on forest genetic resources.

EUFORGEN provided inputs to another MCPFE-related event in October 2008, i.e. the European Forest Week. One of the main events was organized jointly by FAO, the UN Economic Commission for Europe (UNECE), MCPFE and the European Commission at the FAO headquarters in Rome. As part of the Rome gathering, the Secretariat organized a side event on adaptation of forest trees to climate change to highlight the importance of forest genetic resources in this process and to promote the work done by EUFORGEN. The recommendations of the workshop on climate change and forest genetic diversity, held in Paris in 2006, were presented during the side event. Furthermore, two presentations were delivered by the Chairs of the Conifers and Forest Management Networks (Bruno Fady (INRA-Avignon, France) and Jason Hubert (Forestry Commission, UK), respectively). The Secretariat also organised an exhibition booth during the European Forest Week.

2.3. Network activities

During 2007-2008, EUFORGEN had continued to operate through one thematic and three species networks (Forest Management, Conifers, Scattered Broadleaves and Stand-forming Broadleaves). A total of 101 experts from the member countries are participated in these Networks. The Forest Management Network had been focusing on promoting practical implementation of gene conservation and appropriate use of genetic resources as part of sustainable forest management (Objective 1) and the species networks developed technical guidelines and gene conservation strategies for forest trees (Objective 2). All networks had contributed to making improved information available on forest genetic resources in Europe (Objective 3). Each Network followed its own work plan which was developed based on the objectives of Phase III and activities identified by the Steering Committee.

Chairs and Vice-Chairs of the Networks have remained the same since the beginning of Phase III. The contributions made by the following persons and their dedication are gratefully acknowledged; Jason Hubert (United Kingdom) and Bjerne Ditlevsen (Denmark), Chair and Vice-Chair of the Forest Management Network; Bruno Fady (France), Chair of the Conifers Network; Bart De Cuyper (Belgium) and Berthold Heinze (Austria), Chair and Vice-Chair of the Scattered Broadleaves Network; and Georg von Wühlisch (Germany) and Alexis Ducouso (France), Chair and Vice-Chair of the Stand-forming Broadleaves Network.

The Steering Committee decided that the Forest Management Network would meet annually and the species networks three times during Phase III. A total of five Network meetings were held in 2007-2008 (Table 2.1) and two meetings were scheduled for 2009. The Inter-Network Group, i.e. Chairs and Vice-Chairs of the Networks, met twice in 2007 and discussed their inputs to the EUFGIS project and other cross-cutting Network activities. The Secretariat is grateful for the help and inputs provided by all host countries and their institutions.

Table 2.1. EUFORGEN meetings during Phase III (2005-2009).

Network/Group	Meeting venue and date	No. of countries
Forest Management Network	1 st meeting, Lambrecht, Germany, 3-5 November 2005	23
	2 nd meeting, Bucharest, Romania, 23-25 November 2006	20
	3 rd meeting, Rovaniemi, Finland, 27-29 November 2007	24
	4 th meeting, Leuven, Belgium, 4-6 November 2008	21
	5 th meeting, venue to be confirmed, Portugal, November 2009	To be held
Conifers Network	5 th meeting, Larnaca, Cyprus, 7-9 April 2005	25
	6 th meeting, Reykjavik, Iceland, 7-9 September 2006	25
	7 th meeting, Sopron Hungary, 10-12 June 2008	24
Scattered Broadleaves Network	1 st meeting, Copenhagen, Denmark, 11-14 May 2005	33
	2 nd meeting, Valkenburg, The Netherlands, 21-23 September 2006	31
	3 rd meeting, Skiphelle, Norway 20-22 May 2008	27
Stand-forming Broadleaves Network	1 st meeting, Viterbo, Italy, 20-22 October 2005	28
	2 nd meeting, Novi Sad, Serbia, 27-29 June 2007	23
	3 rd meeting, Antalya, Turkey, 31 March-2 April 2009	23
Inter-Network Group	Inter-Network meeting, Novo mesto, Slovenia, 25 May 2007	6
	Inter-Network meeting, Birkerød, Denmark, 22 October 2007	5
Steering Committee	5 th meeting, Novo mesto, Slovenia, 22-24 May 2007	29
	Phase IV Working Group, Rome, Italy, 28-29 April 2009	5
	6 th meeting, Thessaloniki, Greece, 9-12 June 2009	29
MCPFE Workshop	Climate change and forest genetic diversity; Implications for sustainable forest management in Europe, Paris, France, 15-16 March 2006	26

The following chapters provide highlights of the Network activities during 2007-2008. The Chairs of the four Networks will also present their updates to the Steering Committee in Thessaloniki.

2.3.1. Forest Management Network

The Forest Management Network held its third meeting in Rovaniemi, Finland in November 2007. The meeting was hosted by the Ministry of Agriculture and Forestry in collaboration with the Finnish Forest Research Institute (Metla) and the State Forest Service (Metsähallitus). The Network discussed the final outcomes of its earlier efforts, namely 1) a survey on policy tools to promote the use of high quality forest reproductive material, 2) a collection of examples on inappropriate use of forest reproductive material, and 3) a survey on relevant policies and practices related to gene conservation and forest management. The findings of these efforts will be reported in a thematic publication on forest management and forest genetic resources. This publication is being developed together with the species Networks.

The Network also discussed the use of forest reproductive material for energy plantations and other non-forestry purposes, such as hedges. It had collected some preliminary information from Austria, Belgium, France, Hungary and Ireland. The results of this pilot survey indicated that the annual area established for energy wood plantations is highest in Hungary (somewhere between 1,000 and

10,000 ha), while in other countries, the area is considerably lower. Poplars and willows are the most common tree species used for energy wood production. There is a national programme or strategy (or it is planned) for promoting the establishment of energy wood plantations in all the countries that provided the feedback, except in Belgium. In addition, all countries, except Austria, have a national grant programme supporting the establishment of energy wood plantations.

The role of forest genetic resources in adaptation of forests to climate change was also discussed in Rovaniemi based on presentations from the UK, France, Finland and the Netherlands. It was pointed out that extreme weather events, such as storms, will cause more damage to forests than slowly increasing average temperature. This will subsequently have implications for selecting what forest reproductive material or which tree species should be used in the areas prone to storms. The participants also raised several questions on the use of local material and how the existing stands will cope with climate change. Some participants mentioned that the use of local material is encouraged in their countries. Others stressed that using local material or promoting natural regeneration may not solve the problems because the existing material can be poorly adapted not only to the present climate, but also to the future one in a given site. The discussion concluded that both the use of genetic and species diversity help reduce the negative impacts of climate change on forests and that this message should be better communicated to forest managers.

The meeting included a seminar on forest management and forest genetic resources in northern Finland. The seminar presentations focused on problems in seed supply and forest regeneration, and reconciliation of forestry and other land uses in the state forests of Finnish Lapland.

The fourth meeting of the Forest Management Network was held in Leuven, Belgium in November 2008. It was hosted by the Research Institute for Nature and Forest (INBO). The Network reviewed the progress made in developing the cross-Network publication on forest management and forest genetic resources. The meeting also discussed a draft outline of another publication on genetics aspects of forest management which is targeted at managers and policy makers. This publication will discuss the role of the regeneration method (natural versus artificial) and then describe the genetic consequences of the subsequent silvicultural chain. The Network also agreed to include climate change considerations into the above mentioned topics.

In Leuven, the Network continued the discussion on climate change and its implications to the use of forest reproductive material. The participants also shared information on the climate change discussions in different countries. Some countries had already analysed various options for future use of forest reproductive material and identified key issues for further considerations in this regard. The Network decided to summarize these analyses and develop an overview of the options and issues for the benefit of other countries. A working group was set up for this task and it should present its findings as a four-page leaflet by the end of 2009.

The Network also discussed how to promote 'wise' use of forest reproductive material. As an example, the use of a new online tool was demonstrated. It was developed in Denmark to provide information and recommendations for selecting tree species and provenances for planting in different parts of the country (see www.plantevalg.dk). On the website, users can start by pointing at a planting site on the map and the tool then shows a more detailed map of the site and to which planting zone the site belongs to. The users may adjust the location of the indicated site and then

continue by choosing one of three modules. The participants acknowledged that the online tool is very useful and that many of them would be keen to develop a similar tool in their own countries.

The meeting included a seminar on local forest management issues, such as delineation of provenance regions and production of planting stock to enhance genetic diversity of autochthonous tree populations. During the seminar, the participants also discussed how to reach practical forest managers and how to disseminate research findings and guidelines to them.

2.3.2. Conifers Network

The Network finalized minimum requirements for gene conservation units of conifers in 2007. Climate change considerations were included in the document, which encourages the creation of artificial gene conservation units farther north than the current distribution range of species to accelerate adaptation processes, as well as the relocation of southernmost and/or marginal populations demonstrating recent adaptation problems.

The Conifers Network also provided inputs to the FAO Silva Mediterranean meeting on conifers that was held in Arezzo, Italy in June 2007. The meeting reviewed of the earlier established conifer provenance trials in the Mediterranean countries and discussed how to continue their monitoring. The meeting was attended by the Chair of the Network and the EUFORGEN Coordinator.

The seventh meeting of the Conifers Network was organized in Sopron, Hungary in June 2008. The meeting was hosted by the University of West Hungary and the participants also visited the Sárvár Experimental Station of the Hungarian Forestry Research Institute during the field trip. During the meeting, the participants discussed the progress made in collecting data on gene conservation units for the common action plans. The Network had earlier agreed to focus on the following groups of conifers:

- Group 1: stand-forming/widespread species (*Picea abies*, *Pinus halepensis/brutia*),
- Group 2: scattered/widespread (*Taxus baccata*)
- Group 3: rare/threatened (*P. nigra* ecotypes, Mediterranean *Abies* spp.)
- Group 4: exotic conifers (*Picea sitchensis*, *Pseudotsuga menziesii*)

Each Network member was asked to propose a few gene conservation units in their country to be included in the pan-European network of the gene conservation units for these species. After the meeting in Sopron, the different groups have continued collecting data on the proposed units. Table 2.2 presents a summary of the number of selected gene conservation units for the targeted conifer species.

Table 2.2. Number of selected gene conservation units for conifers.

	Species	No of selected units*	No of countries providing the data
Group 1	<i>Picea abies</i>	43	11
	<i>Pinus halepensis/brutia</i>	14	4
Group 2	<i>Taxus baccata</i>	14	8
Group 3	<i>Pinus nigra</i> ecotypes	17	7
	Mediterranean <i>Abies</i> spp.	24	7
Group 4	<i>Picea sitchensis</i>	5	1
	<i>Pseudotsuga menziesii</i>	8	2

* includes both *in situ* and *ex situ* units

During the Sopron meeting, the Conifers Network also discussed the development of Technical Guidelines. These were finalized for European larch (*Larix decidua*) and Bosnian pine (*Pinus leucodermis*) in 2008, and two others are under preparation (for Macedonian pine (*Pinus peuce*) and English yew (*Taxus baccata*)). The Network also agreed to develop additional Technical Guidelines for mountain pine (*Pinus mugo*) and Mediterranean *Abies* species.

Furthermore, the Network decided to prepare a review paper on genetic consequences of seed harvesting in conifers. The paper will provide recommendations on how to collect seeds from gene conservation units or seed stands while maintaining genetic diversity. It will also discuss the roles of gene flow, mating system and spatial genetic structure. The paper will be published as a chapter of the publication on forest management and forest genetic resources, together with contributions from other EUFORGEN Networks.

The use of forest reproductive material and its implications for conservation of forest genetic resources were also discussed. Forest reproductive material produced for trade is well documented in Europe but the problem lies in the fact that most countries do not keep records on how and where the material is finally used. In Hungary alone, there are some 900 registered nurseries producing 307 million seedlings of forest trees annually and large part of the production is exported to other countries. The imported material may threaten gene conservation efforts if it is planted close to gene conservation units of autochthonous tree populations and cause loss of adaptability of production forests.

The Conifers Network then discussed the selection of genetic material for given site conditions and how climate change is expected to impact this. In marginal environments in particular, the adaptive potential of the material is a critical factor. It was considered necessary that the knowledge gained so far by testing or by practical experience should be incorporated into the characterization of forest reproductive material, and that the properties of the genetic material traded should be provided with more details, if they are known (e.g. early or late flushing provenance, photoperiod and temperature in relation to flushing and growth, and plasticity if the material tested in many sites).

2.3.3. Scattered Broadleaves Network

In 2007, the Scattered Broadleaves Network continued collection of information on the gene conservation units of the selected scattered broadleaves. The Network had agreed to develop the common action plans for the following groups of tree species:

- Group 1: *Fraxinus excelsior* and *Prunus avium*
- Group 2: *Populus nigra* and *Ulmus laevis*
- Group 3: *Pyrus pyraeaster* and *Sorbus torminalis*

The third Network meeting was held in Skiphell, Norway in May 2008 and it was hosted by the Norwegian Forest Research Institute. During the meeting, the three working groups discussed in detail the proposed units and accepted most of them. Several other units were also approved on the condition that countries provided further data on the units so that they could be assessed against the minimum requirements. Some units were rejected from the network of gene conservation units as it was considered that the units did not meet the minimum requirements. The collection of data on the proposed units has continued after the meeting and Table 2.3 summarises the information on the selected units.

Table 2.3. Number of selected gene conservation units for scattered broadleaves.

	Species	No of selected units*	No of countries providing the data
Group 1	<i>Fraxinus excelsior</i>	50	13
	<i>Prunus avium</i>	45	12
Group 2	<i>Populus nigra</i>	15	9
	<i>Ulmus laevis</i>	15	11
Group 3	<i>Pyrus pyraeaster</i>	10	5
	<i>Sorbus torminalis</i>	14	8

* includes both *in situ* and *ex situ* units

Another working group has been discussing methods for genetic monitoring. This initiative was recognized to be rather ambitious and, during the meeting in Skiphelle, the participants agreed that the work should focus on genetic monitoring of the gene conservation units instead of overall forest management. The working group then prepared a background document on genetic monitoring and it will be presented to the Steering Committee in Thessaloniki for further discussion.

The Network is also preparing a review article on the use of genetic resources of scattered broadleaves in forest restoration efforts in Europe. This will be published as a chapter of the cross-Network publication. In 2008, the Network finalized Technical Guidelines for Italian alder (*Alnus cordata*) and two more guidelines are currently being finalized for walnut (*Juglans regia*) and European white poplar (*Populus alba*). The Network also developed public awareness leaflets for *Malus-Pyrus*, *Populus nigra*, *P. alba* and *Ulmus* spp.

The meeting in Skiphelle included a seminar on genetic diversity of marginal tree populations and the role of these populations in developing gene conservation strategies at pan-European level. The

discussions stressed the role of these populations in the face of climate change. In this regard, the Network also discussed the role of provenance trials, how forest reproductive material could be moved to facilitate the adaptation of trees to climate change and the impact of photoperiod on tree growth.

2.3.4. Stand-forming Broadleaves Network

The second meeting of the Stand-forming Broadleaves Network was organized in Novi Sad, Serbia in June 2007 and it was hosted by the Serbian Institute of Lowland Forestry and Environment. A working group presented the outcomes of its discussions on the development of minimum requirements for gene conservation units of stand-forming broadleaves. The minimum requirements were then finalized after the meeting.

In Novi Sad, the Network also discussed the development of the common action plans for stand-forming broadleaves and identified five groups of species for this purpose:

- Group 1: *Castanea sativa*, *Fagus* spp., *Quercus robur* and *Q. petraea*
- Group 2: *Betula pendula* and *Populus tremula*
- Group 3: xerophyllous oaks (*Quercus pubescens*, *Q. cerris* and *Q. frainetto*)
- Group 4: evergreen oaks (*Quercus suber* and *Q. coccifera*)
- Group 5: minor and rare oak species

The participants highlighted problems in the taxonomy of oaks (e.g. more or less all the species within a section interbreed and the hybrids are fertile) and the fact that there is a large number of oak species (including many rare with very limited distribution) and synonyms (e.g. *Quercus pubescens* ssp. *pubescens* has more than 440 synonyms). In 2007, the Network also made efforts to compile a Europe-wide map of provenance regions based on national provenance delineation for several species (*Fagus sylvatica*, *Quercus petraea*, *Q. pubescens*, *Quercus robur* and *Q. suber*).

The meeting in Novi Sad included a seminar during which the genetic resources of stand-forming broadleaves in Serbia were discussed in more detail. Beech and oaks are the most common tree species in Serbia and there are 288 registered seed stands covering a total of 1832.6 ha (of which 1092.0 ha are for broadleaves, mostly pedunculate oak (*Q. robur*) with 782.6 ha). The country's law on forest reproductive material is also harmonised with Council Directive 1999/105/EC. Delineation of provenance regions, based on ecological conditions and genetic data, is also underway for several stand-forming tree species in Serbia.

The Network met for the third time in Antalya, Turkey in April 2009 and the main item on the agenda was the development of the common action plans. The participants discussed the proposed gene conservation units and the working groups have continued their work after the meeting. Table 2.4 provides an overview on the number of selected units for different species.

Table 2.4. Number of selected gene conservation units for stand-forming broadleaves.

	Species	No of selected units	No of countries providing the data
Group 1	<i>Castanea sativa</i>	3	2
	<i>Fagus</i> spp.	33	12
	<i>Quercus petraea</i>	31	12
	<i>Quercus robur</i>	30	12
Group 2	<i>Betula pendula</i>	4	2
	<i>Populus tremula</i>	1	1
Group 3	Xerophyllous oaks	35	8
Group 4	<i>Quercus suber</i>	4	2
Group 5	Minor and rare oaks	-	-

In Antalya, the Network also discussed finalization of two case studies, 1) the use of provenances with emphasis on the effects of transfer of forest reproductive material, and 2) on genetic consequences of silvicultural practices on beech (*Fagus sylvatica*). These will be published in the cross-Network publication on forest management and forest genetic resources.

The Network has developed Technical Guidelines for birch (*Betula pendula*), oriental beech (*Fagus orientalis*), beech (*Fagus sylvatica*), aspen (*Populus tremula*) and cork oak (*Quercus suber*). In Antalya, the Network also reviewed drafts for several Mediterranean oak species (*Quercus cerris*, *Q. frainetto*, *Q. ilex* and *Q. pubescens*) and decided to make similar efforts for three additional species (*Quercus crenata*, *Q. faginea* and *Q. pyrenaica*).

2.3.5. Inter-Network Group

Two Inter-Network meetings for Chairs and Vice-Chairs were held in 2007. The first one was held in Novo mesto, Slovenia on 25 May 2007 in conjunction with the Steering Committee meeting and the second one was organized as part the EUFGIS workshop in Birkerød, Denmark on 22 October 2007. During these meetings, Chairs and Vice-Chairs exchanged information on the activities of the four Networks and updated each other on the development of the common action plans. They discussed the inputs of the Networks to the EUFGIS project and development of joint thematic publications. The Chairs and Vice-Chairs also discussed how to address climate change as part of the future work of the Networks. It was further agreed that the Forest Management Network should focus on the management implications of climate change while the species Networks should analyze the potential consequences of climate change for gene conservation of forest trees in Europe.

2.4. Documentation and information management

2.4.1. Inputs to the MCPFE reports

In 2007, EUFORGEN provided inputs to two MCPFE reports which were prepared for the Warsaw Conference ('*State of Europe's Forests 2007*' and '*Implementation of MCPFE Commitments. National and Pan-European Activities 2003-2007*'). For the first report, 38 countries provided data on area managed for conservation and utilization of forest tree genetic resources and area managed for seed production (Indicator 4.6 of the pan-European C&I for sustainable forest management) to the Secretariat.

The reported areas managed for gene conservation of forest trees more than doubled from 1990 to 2005. The total area managed for *in situ* gene conservation increased from 316 341 ha in 1990 to 748 382 ha in 2005. During the same period, the number of tree species covered by *in situ* gene conservation efforts also increased, from 59 to 93 species. Similarly, the area managed for *ex situ* gene conservation increased from 3 234 ha to 7 392 ha and the number of tree species from 56 to 85. The areas managed for seed production also showed an increasing trend. In 1990, the total area managed for seed production was 464 080 ha and covered 85 species. By 2005, the seed production area had increased to 528 707 ha with 90 species.

A total of 135 tree species (including subspecies and hybrids) are included in gene conservation and seed production efforts but most of these efforts are targeted to a limited number of tree species. A group of seven economically important tree species with large distribution areas (*Abies alba*, *Fagus sylvatica*, *Picea abies*, *Pinus sylvestris*, *Larix decidua*, *Quercus petraea* and *Q. robur*) alone account for 82 percent of the total area managed for *in situ* gene conservation. While the state of gene conservation is good for many stand-forming and widely distributed tree species, the situation needs to be improved in the case of scattered tree species. In addition, the genetic resources of several rare and endangered tree species are still inadequately conserved and need urgent attention. Furthermore, the marginal populations of many widely distributed tree species are facing new threats at the edges of their geographical range areas due to climate change.

For the second report, the Secretariat summarized the EUFORGEN activities during 2003-2007. It concluded that good progress had been made in implementing the relevant resolutions on forest genetic resources both at national and pan-European levels. The two reports are available from the MCPFE Website (www.mcpfe.org/publications/pdf/).

2.4.2. State of forest genetic resources in Europe

In 2004, the Steering Committee recommended that EUFORGEN should publish a report on the 'State of Forest Genetic Resources in Europe' by the end of Phase III. In 2007, the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA) agreed that a State of the World's Forest Genetic Resources (SoW-FGR) report should be prepared and presented to the Commission (i.e. to FAO member countries) in 2013.

Following this, the Secretariat collaborated with FAO and contributed to the planning process of the SoW-FGR report since April 2008. In December 2008, the EUFORGEN Coordinator also participated in the 15th Session of the FAO Panel of Experts on Forest Gene Resources. The meeting discussed the SoW-FGR process, drafted an outline of the report and identified 13 thematic studies to be carried out as part of the report.

The development of the SoW-FGR report was further discussed by the FAO Committee on Forestry (COFO) during its 16th Session in March 2009. The COFO expressed its support for the development of the SoW-FGR report for further action on forest genetic resources at the national, regional and global levels. It also urged the member countries to collaborate with FAO and partner organizations in producing the report. A statement of the European Union at the COFO session specifically highlighted the role of EUFORGEN and EUFGIS in providing European inputs to the SoW-FGR report.

During its fifth meeting in 2007, the Steering Committee requested the Secretariat to prepare a draft outline of the European report. It also agreed that the preparation of the report should be closely coordinated with the global efforts of FAO. It is not known yet in detail what kind of data FAO will ask countries and collaborating organizations to provide for the global report. The Secretariat has not had enough information to develop the outline of the European report so that it is well aligned with the data requirements of the global report. FAO will present its plans for the development of the SoW-FGR report at the forthcoming Steering Committee meeting in Thessaloniki.

2.4.3. European information system on forest genetic resources

The EUFGIS project ('Establishment of a European Information System on Forest Genetic Resources') was launched on 1 April 2007 for a period of 3.5 years. Bioversity International developed the project in collaboration with six partners (Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW), Austria; State Forest Tree Improvement Station (SNS), Denmark; Institut National de la Recherche Agronomique (INRA), France; National Forest Centre (NLC), Slovakia; Slovenian Forestry Institute (SFI), Slovenia; and Forest Research, UK). The project is co-funded by the European Commission (€553,860, 50% of the total budget) under the Council Regulation No 870/2004 on genetic resources in agriculture (DG Agriculture).

All EUFORGEN member countries and several associated countries have been invited to participate in the project. As of April 2009, a total of 35 countries have nominated their national focal points to EUFGIS (Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Former Yugoslav Republic of Macedonia, Moldova, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Turkey, Ukraine and United Kingdom).

In October 2007, the EUFGIS project organized a workshop in Birkerød, Denmark to discuss the documentation of forest genetic resources in Europe. The workshop also identified future needs in this area and made recommendations for the development of the EUFGIS information system. After the workshop, an expert group, consisting of representatives of the EUFORGEN Networks and FAO, further discussed the workshop recommendations and initiated the development of pan-

European minimum requirements and data standards for gene conservation units. This work was based on the earlier work of the EUFORGEN Networks.

In 2008, the EUFGIS expert group continued its work and met again in Avignon in April and in Ljubljana in October. In early 2009, the group then finalized the minimum requirements and the data standards. The minimum requirements serve as a check list for which kind of gene conservation units can be entered into the EUFGIS information system. The data standards define what information on the units the national focal points should provide. The intranet and database part of the information system were subsequently developed based on the data standards.

In spring 2009, the EUFGIS project organized four sub-regional training workshops for the national focal points to help them compile national data sets and to upload the data, via intranet, to the information system. These workshops were held in Vienna (March), Ljubljana (April), Avignon (May) and Copenhagen (May). The national focal points have continued compiling and uploading data, and this work is expected to be finalized by the end of 2009. Currently, the information system contains data on 1020 gene conservation units in 30 countries. The launch of the EUFGIS portal and the final project meeting are scheduled for mid-2010.

2.5. Publications and public awareness material

In 2007, EUFORGEN published papers presented at the Paris workshop as a thematic publication. The public awareness leaflet of the Programme and three posters were also updated. Furthermore, similar leaflets were prepared for tree species (*Populus* spp, *Malys-Pyrus* and *Ulmus* spp).

The EUFORGEN Networks finalized 8 new Technical Guidelines. Several countries have translated some of Technical Guidelines into their national languages (i.e. Estonia, France, Germany, Hungary, Italy, Moldova, Slovakia and Spain). In Estonia, a summary of the recommendations for two species was disseminated to local managers. In Spain, the Technical Guidelines have been published as an insert to a national magazine for forest managers since 2007. In 2008, Italy also started the translation of the 15 guidelines for those tree species occurring in Italy. France and Germany have translated one Technical Guidelines each and France is planning to translate more. Belgium, The Netherlands and Slovenia have also informed the Secretariat that translation or printing of Technical Guidelines is underway.

The Secretariat has developed a template and notes to help countries in the translation process. The content and recommendations of Technical Guidelines as well as authors should remain unchanged after translation while translators or other national experts can author a two-page insert as a supplement to be added to a given publication. The insert should then provide specific national information on a tree species or recommendations for the management of its genetic resources in the country.

A list of EUFORGEN and other related publications in 2005-2009 is presented in Annex 1, page 33.

2.6. Wider influences of EUFORGEN

2.6.1. Training programme on forest biodiversity

In 2005, Bioversity International started to implement a project on 'Developing training capacity and human resources for the management of forest biodiversity' in collaboration with the Federal Research and Training Centre for Forests, Natural Hazards and Landscape (BFW), Austria. During this five-year project, funded by Austria, Bioversity is organising five two-week training workshops and providing five two-year research fellowships. Both the workshops and the fellowships focused on a different region of the world in each year.

The project organized the third training workshop in Tashkent, Uzbekistan in August 2007. The EUFORGEN Secretariat provided some technical inputs to the preparations of the workshop, which was attended by 23 young scientists from Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan. The 2007 fellowship was awarded to a researcher from the Kyrgyz Agrarian University. He started his fellowship at BFW in October 2007 and he has been working on characterization of genetic structure and reproductive biology of *Juniperus seravschanica* in Kyrgyzstan.

The fourth training workshop was organized in Adama, Ethiopia in June 2008, but the Secretariat did not provide any significant inputs to it.

2.6.2. EVOLTREE Network of Excellence

In 2007-2008, EUFORGEN continued collaboration with the EVOLTREE project (EVOLution of TREEs as drivers of terrestrial biodiversity), which is a consortium of 25 partner institutes (including Bioversity International) from 15 European countries. EVOLTREE is coordinated by INRA (France) and funded by the European Commission under the sixth framework programme for research. Bioversity International is leading the dissemination activities of EVOLTREE. An update on the EVOLTREE activities was presented at the EUFORGEN Network meetings and, in February 2008, the EUFORGEN Coordinator participated in the first EVOLTREE Stakeholder meeting in Mandelieu-La Napoule, France. Further information on EVOLTREE can be found on its Website (www.evoltree.eu).

2.6.3. Other EUFORGEN contributions

The Secretariat provided additional contributions to various initiatives on forest genetic resources and promoted the Programme during relevant meetings and events in 2007-2008.

In February 2007 and December 2008, the EUFORGEN Coordinator participated in the meetings of the FAO Panel Experts on Forest Gene Resources as an observer and delivered presentations on EUFORGEN and EUFGIS. In December 2008, he also contributed to the Panel's discussion on the development of the State of the World's Forest Genetic Resources Report.

In August 2008, the Coordinator participated in a meeting on 'Nordic forests in a changing climate', held in Selfoss, Iceland, and delivered a presentation on forest genetic resources and adaptation of

forest management to climate change. The meeting was organized by the new Nordic Genetic Resource Center (NordGen), which was established in January 2008 by merging the Nordic Gene Bank (NGB), the Nordic Gene Bank for Farm Animals (NGH) and the Nordic Council for Forest Reproductive Material (NSFP). NordGen–Plants is located in Alnarp, Sweden while NordGen–Farm Animals and NordGen–Forest operate from Ås, Norway.

2.7. EUFORGEN Management Committee

The Management Committee provides technical and management advice to the EUFORGEN Secretariat. It meets usually once year and, between the meetings, its members interact with the Secretariat as needed. During 2007-2008, Oudara Souvannavong (Senior Forestry Officer, Biodiversity and Conservation) from the FAO Forestry Department, and Laura Snook (Director, Understanding and Managing Biodiversity Programme) and Lex Thomson (Senior Scientist, Forest Genetic Resources) (until June 2007) from Bioversity International participated in the Management Committee. The continuous support and advice of the Committee members are gratefully acknowledged.

2.8. EUFORGEN Secretariat

Ewa Hermanowicz joined the Secretariat in August 2007 and has since worked as Programme Assistant to the EUFGIS project. No other staff changes have taken place during 2007-2008. Lidwina Koop (Programme Assistant) and Michele Bozzano (Programme Specialist) have continued to provide excellent administrative and scientific support, respectively, for EUFORGEN (50% of their time).

Annex 1. List of EUFORGEN and other relevant publications (2005-2009).

Thematic publications

Koskela, J., A. Buck and E. Teissier du Cros (editors). 2007. Climate change and forest genetic diversity: Implications for sustainable forest management in Europe. Bioversity International, Rome, Italy. 111 p.

Meeting reports

Bozzano M., M. Rusanen, P. Rotach, J. Koskela (compilers). 2006. EUFORGEN Noble Hardwoods Network, Report of the sixth (9–11 June 2002, Alter do Chão, Portugal) and seventh meetings (22 - 24 April 2004, Arezzo, Italy). International Plant Genetic Resources Institute, Rome, Italy. 98 p.

Koskela, J., C.J.A. Samuel, Cs. Mátyás and B. Fady (compilers) 2007. Conifers Network, Report of the fourth meeting (18–20 October 2003, Pitlochry, United Kingdom). Bioversity International, Rome, Italy. 76 p.

Technical Guidelines

Ducci F. and Tani A. 2009. EUFORGEN Technical Guidelines for genetic conservation and use for Italian alder (*Alnus cordata*). Bioversity International, Rome, Italy. 6 p.

Gil, L. and Varela, M.C. 2008. EUFORGEN Technical Guidelines for genetic conservation and use for cork oak (*Quercus suber*). Bioversity International, Rome, Italy. 6 p.

Kandemir G. and Z. Kaya. 2009 EUFORGEN Technical Guidelines for genetic conservation and use for oriental beech (*Fagus orientalis*). Bioversity International, Rome, Italy. 6 p.

Matras, J. and Pâques, L. 2008. EUFORGEN Technical Guidelines for genetic conservation and use for European Larch (*Larix decidua*). Bioversity International, Rome, Italy. 6 p.

Vakkari P. 2009. EUFORGEN Technical Guidelines for genetic conservation and use for Silver birch (*Betula pendula*). Bioversity International, Rome, Italy. 6 p.

Vendramin, G.G., Fineschi, S. and Fady, B. 2008. EUFORGEN Technical Guidelines for genetic conservation and use for Bosnian pine (*Pinus heldreichii*). Bioversity International, Rome, Italy. 6 p.

von Wuehlisch, G. 2008. EUFORGEN Technical Guidelines for genetic conservation and use for European beech (*Fagus sylvatica*). Bioversity International, Rome, Italy. 6 p.

von Wühlisch G. 2009. EUFORGEN Technical Guidelines for genetic conservation and use for Eurasian aspen (*Populus tremula*) Bioversity International, Rome, Italy. 6 p.

Others papers

Koskela, J. 2007. European Forest Genetic Resources Programme: a European Approach to Gene Conservation of Forest Trees. In: Simpson, J.D. (compiler). Proceedings of the Forum on Conservation of Forest Genetic Resources: Challenges, Issues and Solutions (28-29 July 2006, Charlottetown, PEI). Natural Resources Canada, Canadian Forest Service – Atlantic Forestry Centre, Fredericton, Canada. Information Report M-X-220, pp. 23–30.

Lefèvre, F., Collin, E., De Cuyper, B., Fady, B., Koskela, J., Turok, J. and von Wühlisch, G. 2008. European forest genetic resources: status of current knowledge and conservation priorities. In: Maxted, N., Ford-Lloyd, B.V., Kell, S.P., Iriondo, J.M., Dulloo, M.E. and Turok, J. (eds.). Crop Wild Relatives Conservation and Use, CAB International, UK, pp. 178–194.

Koskela, J., Turok, J. and Bozzano, M. 2005. The role of regional collaboration in managing forest genetic resources in Europe. *International Forestry Review* 7(5):68 (Abstracts of papers and posters presented at the XXII IUFRO World Congress, Brisbane, Australia, 8–13 August 2005).

EUFORGEN contributions to assessment reports

EEA 2008. European forests – ecosystem conditions and sustainable use. European Environment Agency, EEA Report No 3/2008, Copenhagen, 105 p. [chapter ‘3.8 Genetic diversity of European forests’ pp. 39-40].

MCPFE 2007a. State of Europe’s Forests 2007. The MCPFE Report on Sustainable Forest Management in Europe. MCPFE Liaison Unit Warsaw, UNECE and FAO, Warsaw, Poland, 247 p. [chapter ‘Indicator 4.6. Genetic resources’, pp. 59–61].

MCPFE 2007b. Implementation of MCPFE Commitments. National and Pan-European Activities 2003-2007. MCPFE Liaison Unit Warsaw, Poland, 99 p. [chapter ‘S2: Conservation of Forest Genetic Resources’, pp. 70-72].

EEA 2006. Progress towards halting the loss of biodiversity by 2010. European forests – ecosystem conditions and sustainable use. European Environment Agency, EEA Report No 5/2006, Copenhagen, 99 p. [chapter ‘3.2 Forest ecosystems’ pp. 44-56].