European Forest Genetic Resources Programme (EUFORGEN) Phase IV (2010–2014)

Technical report and financial summary for 2012

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1. Introduction

The European Forest Genetic Resources Programme (EUFORGEN) is a collaborative programme between European countries to promote the conservation and sustainable use of forest genetic resources (FGR). It was established in October 1994 as a pan-European implementation mechanism for Resolution S2 (Conservation of forest genetic resources) of the first Ministerial Conference on the Protection of Forests in Europe (MCPFE, now called FOREST EUROPE), held in Strasbourg in 1990. EUFORGEN also contributes to the implementation of Vienna Resolution 4 (Conserving and enhancing forest biological diversity in Europe) (2003). Furthermore, EUFORGEN is one of the international activities contributing to the follow-up of the sixth Ministerial Conference of FOREST EUROPE, held in Oslo in June 2011, and included in the new FOREST EUROPE Work Programme adopted in February 2012.

EUFORGEN is financed by its member countries and coordinated by Bioversity International in technical collaboration with the UN Food and Agriculture Organization (FAO). 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 overall responsibility for the Programme.

During Phase IV (2010–2014), the EUFORGEN objectives are as follows:

1. Promote appropriate use of forest genetic resources as part of sustainable forest management to facilitate adaptation of forests and forest management to climate change
2. Develop and promote pan-European gene conservation strategies and improve guidelines for management of gene conservation units and protected areas
3. Collate, maintain and disseminate reliable information on forest genetic resources in Europe.

EUFORGEN carries out its activities through working groups and workshops. The working groups, each consisting of approximately ten experts, are established by the Steering Committee to address specific issues under Objectives 1 and 2. The Steering Committee also defines the tasks, deadlines and expected outputs for the working groups, whose findings are reported back to the Steering Committee for further action. The results of the working groups are discussed during workshops through which a broader group of experts and stakeholders are engaged in the EUFORGEN activities.

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

Under Objective 3, EUFORGEN is maintaining the EUFGIS Portal and its network of National Focal Points which was created during the EC-supported project *Establishment of a European Information System on Forest Genetic Resources* (2007–2011). In addition, the National Coordinators and the EUFORGEN Secretariat contribute to international reporting efforts on FGR.

This document provides highlights of the EUFORGEN activities in 2012. It also includes a summary on expenditures and financial contributions in 2012. A detailed financial report for 2012 is available as a separate document and has been sent to the member countries.

2. Participation in EUFORGEN

In 2012, EUFORGEN had a total of 25 member countries (Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Luxemburg, The Netherlands, Norway, Poland, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom). Romania also joined Phase IV but it is no longer considered a member country due to its outstanding financial contributions for 2010–2011.

The Secretariat continued the dialogue with non-member countries in Europe and encouraged them to join EUFORGEN. However, no new countries joined the Programme in 2012.

3. Pan-European collaboration on forest genetic resources

3.1. EUFORGEN working groups

In 2012, EUFORGEN operated three working groups on the following topics:

1. Assessment of genetic conservation status of forest trees in Europe and development of pan-European genetic conservation strategies
2. Development of genetic monitoring methods for genetic conservation units of forest trees
3. Development of guidelines for the use and transfer of forest reproductive material in the context of climate change.

The members of the working groups were selected from the pool of national experts nominated by the National Coordinators (1–3 experts nominated for Objectives 1 and 2). Each member country had at least one expert in these working groups. Other nominated experts (so called 'e-mail contributors') had the opportunity to provide their inputs by email and during workshops. All three working groups prepared their draft reports in 2012 and presented them together with their recommendations to the Steering Committee during its eighth meeting, held in Paris, France on 27–29 November 2012.

3.1.1. Working group on genetic conservation strategies

This working group was tasked by the Steering Committee to:

- review the earlier work done by the EUFORGEN Networks
- carry out the assessment of genetic conservation status for model species based on the EUFGIS data
- carry out a review of the knowledge on the genetic diversity of the species
- select the most valuable genetic conservation units from the pan-European perspective
- identify gaps in genetic conservation efforts
- develop genetic conservation strategies at the level of group of species
- prepare a draft report

The second meeting of the working group was hosted by the Research Unit for Intensive Wood Production (CRA–PLF) of the Italian Agricultural Research Council in Casale Monferrato on 14–16 February 2012. During the second meeting, the members of the working group discussed progress made in different tasks since the first meeting, which was organized at Bioversity in November 2011. They reviewed the outline of the report and contributions received for different chapters. The members then agreed new tasks and deadlines for finalizing the draft report before September 2012. The summary of the second meeting is available on the EUFORGEN website (http://www.euforgen.org/meetings.html).

In May 2012, the leader of the working group briefed the EUFGIS national focal points on the preparation of the pan-European genetic conservation strategy for forest trees during a workshop on FGR inventories that was organized in Szombathely, Hungary. The working group finalized its draft report during summer 2012 and it was then presented to a larger group of EUFORGEN experts during another workshop on FGR conservation and monitoring in Järvenpää, Finland on 18–20 September 2012. The members of the working group also participated in this workshop. The working group received a number of valuable comments and other inputs that were incorporated into the draft report after the workshop.

The overall goal of the genetic conservation strategy is to conserve both adaptive and neutral genetic diversity of forest trees within their distribution ranges in Europe. It also aims to create a pan-European core network of selected genetic conservation units. For the purpose of testing different approaches, the working group identified 12 pilot tree species representing stand-forming and scattered species with both wide and limited distribution ranges. The working group used a climatic stratification of Europe as a proxy for characterizing the adaptive diversity conserved in the genetic conservation units across the continent. It also identified gaps in the conservation efforts based on what are called 'country x zone' areas, i.e. each country within the distribution range of a given species was divided into environmental zones and it was then evaluated how many of the zones within the countries had conservation units. Furthermore, the working group identified gaps in conservation of neutral genetic diversity based on an 'area of interest' approach (i.e. migration routes, refugia areas and contact zones) using information available from earlier genetic studies. The selection of conservation units for the core network was done using the EUFGIS database. The core networks of the pilot tree species, once established, should cover all countries and environmental zones within the distribution ranges of a given species. The conservation strategy can be applied to all European tree species in the future.

In November 2012, the working group presented its draft report to the Steering Committee which expressed its satisfaction with the results. The members of the Steering Committee also provided several comments to the draft report. The Steering Committee endorsed the systematic approach (i.e. country x zones) used for developing the strategy and requested the working group to finalize its draft report by carrying out new analyses based on a new environmental zoning which was expected to be published in early 2013. The Steering Committee also recommended that the working group scale up the area threshold (from 50 km^2) used in identifying gaps, in order to have more feasible conservation targets, if possible. Furthermore, the Steering Committee recommended having more discussion on the limitations of the systematic approach in the final report.

3.1.2. Working group on genetic monitoring

The working group on genetic monitoring was assigned to prepare:

- synthesis of existing documents
- analyses of the EUFGIS and other databases (e.g. ICP forest) relevant to genetic monitoring purposes
- recommendations for improving EUFGIS data standards for genetic monitoring
- options for genetic monitoring methods, including defining time intervals for monitoring (per groups of tree species)
- cost assessment of the options for genetic monitoring methods
- draft report

The first meeting of the working group was organized at Bioversity International in Maccarese, Italy on 17–19 January 2012 and the second one at the School of Forestry (ETSI Montes) of the Technical University of Madrid (UPM) in Spain on 22–24 May 2012. The summaries of the two meetings are available on the EUFORGEN website (http://www.euforgen.org/meetings.html).

During its first meeting, the members of the working group gathered relevant information, exchanged ideas and views on genetic monitoring of tree populations, and developed a tentative outline of the report. They also selected a leader of the working group, identified lead contributors for each chapter of the report and agreed deadlines for preparing first drafts of the report chapters. Progress was then discussed during the second meeting. After that, the draft report was finalized and presented to the workshop on FGR conservation and monitoring, which was held in Järvenpää, Finland in September 2012. The members of the working group attended this workshop, during which they also organized a brief evening meeting to discuss the comments and feedback received.

The working group selected a gene-ecological approach as the conceptual framework for developing the pan-European genetic monitoring system and recognized natural selection and genetic drift as the major forces of evolution which are mediated by gene flow. In its report, the working group proposed that the genetic monitoring system could be based on only two indicators (selection and genetic variation & mating system) and 10 verifiers. Subsequently, the working group proposed three options:

- Option 1 (Basic): Use of demographic data only. Indicator-I (selection) is fully evaluated with a set of five verifiers (age/size class distribution, mortality, reproductive fitness, regeneration abundance, and fructification).
- Option 2 (Standard): Use of demographic and genetic data. Indicator-I is fully evaluated with the above-mentioned demographic verifiers. Indicator-II (genetic variation & mating system) is fully evaluated with genetic verifiers using SSR and/or SNP genotyping.
- Option 3 (State-of-the-art): Use of demographic and genomic (NGS) data. Indicator-I is fully evaluated with the demographic verifiers and signatures of selection provided by GWA of sequence data. Indicator-II is fully evaluated with genetic verifiers based on genomic (NGS) data.

The purpose is not to monitor all conservation units or all tree species in Europe but only a few selected ones (typically 10–15 units per pilot tree species). The working group used an expert–based approach for identifying potential monitoring regions across Europe, and selected 14 keystone species and one endangered species for testing purposes. The monitoring regions were tentatively identified based on the distribution map of a tree species, the existing genetic conservation units characterized by environmental zones, any available genetic information (marker data or adaptive traits from provenance trials, refugia areas and migration routes).

The costs of the three options were calculated based on a minimum plot size of four hectares with 50 or more reproducing trees. The estimated average labour costs for the demographic verifiers were estimated to be € 8,500 per unit and per decade for all options. The estimated costs of genetic analyses were € 3,000, € 2,500 and € 28,500 per population and per decade for nSSR, SNP and NGS analyses, respectively. The total cost estimates of one monitoring cycle (one decade) for a monoecious stand-forming species with a set of 10 monitoring units range from € 291,328 (Option 1) to € 321,028 (Option 2) and € 600,128 (Option 3). The working group acknowledged that the genetic monitoring system cannot be created without specific funding but noted that, while investigating funding possibilities, the work could be started by finalizing the selection of genetic monitoring units and by developing technical guidelines for genetic monitoring.

The draft report of the working group was presented to the Steering Committee in November 2012. The Steering Committee expressed its appreciation to the working group and provided feedback on the report. It then requested that the working group finalize its draft report based on the comments and guidance received. The Steering Committee decided that further development of the pan-European genetic monitoring system for forest trees should be based on Option 2 and that the working group should select fewer pilot species for which there are adequate amount of genetic information available and relevant genetic markers developed. The Steering Committee also endorsed the proposal by the working group that the genetic monitoring units should be selected, as much as possible, from those genetic conservation units that have been selected for the establishment of the core network by the other working group.

3.1.3. Working group on forest reproductive material (FRM)

The third working group was requested by the Steering Committee to:

- review existing work from EUFORGEN Networks and relevant European projects
- synthesize existing (national) guidelines
- select (widely used) model species
- identify critical factors related to climate change and future needs to transfer FRM
- summarize lessons from provenance trials for seed transfer
- consider if any relevant information should be added to the accompanying documents as specified in the EC Directive and other relevant schemes covering the movement of FRM
- compile a list of existing models and tools that can be used for future forest management planning and transfer of FRM
- list the issues related to the climate change context
- prepare a draft report (including recommendations)

The working group on forest reproductive material (FRM) organized two meetings in 2012. The first one was hosted by Bioversity International in Maccarese, Italy on 28–30 March 2012 and the second one by the Bavarian Office for Forest Seeding and Planting (ASP) in Freising, Germany on 4–6 July 2012. The meeting summaries are available on the EUFORGEN website (http://www.euforgen.org/meetings.html).

During its first meeting, the members of the working group discussed the tasks, gathered relevant information and developed a tentative outline of the report. They also selected two co-leaders of the working group, identified lead contributors for each chapter of the report and agreed deadlines for preparing first drafts of the report chapters. The work continued after the first meeting and progress was discussed during the second meeting. The working group finalized the draft report in early November 2012 and it was then presented to the Steering Committee for comments.

The draft report was built around key topics, such as future challenges brought by climate change, legal and policy frameworks dealing with FRM, existing guidelines for the use of FRM, and scientific and practical considerations related to the future use of FRM. The working group acknowledged that climate change is a complex phenomenon which is expected to affect tree populations in several ways and that this makes it difficult to find simple answers to the tasks it was requested to investigate. In its report, the working group noted that provenance experiments of forest trees provide a huge resource for evolutionary ecology and climate change studies, and that they represent the most reliable basis for practical recommendations on the future use of FRM. The report also presents some recent studies in Canada and the USA which had tested new approaches for seed zone delineation and providing seed transfer recommendations (e.g. the 'floating principle' of seed transfer).

The report recommends a revision of FRM transfer rules at the pan-European level as most national guidelines do not provide any guidance for cross-border transfer of FRM, and this is expected to increase under climate change. It also re-affirmed the idea that FRM transfer is a valid option for adapting forests to climate change but recognized that transfer of FRM also has its limits. The

working group concluded that there is a continued need to enhance dissemination of information on the use and transfer of FRM to forest owners, managers and policymakers.

In November 2012, the Steering Committee discussed the findings of the draft report and acknowledged the fact that the use and transfer of FRM is a complicated issue. The Steering Committee requested that the working group revise the draft report based on the comments received. Furthermore, the Steering Committee agreed that a workshop will be organized in 2013 to discuss the draft report before it is finalized.

3.2. EUFORGEN Workshops

3.2.1. Workshop on inventories of forest genetic resources

The workshop was organized in Szombathely, Hungary on 8–10 May 2012 in collaboration with the Hungarian Forest Research Institute (ERTI) and the FORGER project (see section 5.3 below). A total of 38 experts from 25 countries participated in the event. The purpose of the workshop was to discus further development of the EUFGIS Portal, provide an overview of other relevant FGR databases, discuss linking of databases (especially EUFGIS and GD^2 (Geo-referenced Data on Genetic Diversity) and exchange information on progress made in national FGR inventories and other new developments in this area. Most of the participants were the EUFGIS national focal points at whom the event was targeted. Presentations delivered during the workshop provided an overview of European research infrastructures relevant for FGR inventories as well as earlier and ongoing EU-funded projects dealing with FGR inventories and databases. The summary of the workshop is available on the EUFORGEN website (http://www.euforgen.org/meetings.html).

The workshop participants made several detailed recommendations for improving the EUFGIS portal and database. In addition, a number of issues related to the pan-European minimum requirements and data standards for the genetic conservation units of forest trees were clarified during the workshop.

The workshop discussions revealed that there is a need for increased collaboration and information exchange between different projects and initiatives. It was thus recommended that different projects could organize joint workshops for dissemination of their results. This would also benefit the EUFORGEN work and facilitate the use of the results of different projects in practical FGR conservation. It was also recommended that projects should make their databases and other results widely available (i.e. beyond project partners) as soon as the projects have ended.

The workshop welcomed the ongoing efforts to link the EUFGIS and GD^2 databases but noted that it would be useful if these two *in situ* databases would also be linked to *ex situ* databases (e.g. provenance trials and clone collections) and *vice versa*. This would increase the accessibility and usability of all types of FGR data in Europe. The workshop further proposed that the databases on genebanks, provenance trials and progenies developed by the TREEBREEDEX project could be made available for a broader group of users in the context of the TREES4FUTURE project (see www.trees4future.eu for details).

3.2.2. Workshop on conservation and monitoring of forest genetic resources

The workshop was organized in Järvenpää, Finland on 18–20 September 2012 in collaboration with the Finnish Forest Research Institute (Metla) and the FORGER project. It was attended by 35 participants from 21 countries. The purpose of the workshop was to discuss the development of the pan-European genetic conservation strategy and the genetic monitoring scheme for forest trees, and how the results of the FORGER project could be used to improve these initiatives. The summary of the workshop is available on the EUFORGEN website (http://www.euforgen.org/meetings.html).

The workshop also discussed synergies between the two working groups and between EUFORGEN activities and the FORGER project. It was agreed that, as much as possible, the monitoring units should be selected from the core network of the genetic conservation units and that other units can also be selected for genetic monitoring if there are specific reasons for that. The workshop participants emphasized that it is important that the tentative selection of units for both purposes be sent together to the National Coordinators so that they can consider various aspects before confirming the selected units or proposing changes. It was pointed out that practical considerations influence much more the selection of units for genetic monitoring (selected units should be easily accessible, for example) as compared to the selection for the core network.

Concerning the synergies between EUFORGEN and the FORGER project, several participants noted that these are obvious and that many of the FORGER activities build on the earlier work by EUFORGEN. It was also noted that the FORGER work on FGR inventories and genetic monitoring will directly benefit the implementation and future revision of the pan-European genetic conservation strategy. Furthermore, field-testing of genetic monitoring protocols would not have been possible with the current resources of EUFORGEN. The FORGER results on genetic monitoring are also very useful for finalizing many technical details of the planned pan-European genetic monitoring scheme and making the whole scheme more feasible to implement in practice.

3.3. Development of EUFORGEN Technical Guidelines

No new technical guidelines were published in 2012. The technical guidelines published so far (32 in total) and the distribution maps are available from the EUFORGEN website (www.euforgen.org).

Several countries have translated selected guidelines into their national languages. The EUFORGEN Secretariat facilitates the translation process by providing a publication template and instructions when requested. The translation and production work is done by national institutions and experts. As part of the translation process, several countries have also developed an additional factsheet providing national-level information for a given species.

In 2012, Slovenia translated additional guidelines for 14 species. Table 1 shows a list of tree species for which translated guidelines are now available. Requests for printed copies of the translated guidelines should be addressed to the National Coordinators. Most of the translated guidelines are available in electronic format through the respective country pages of the EUFORGEN website.

Table 1. List of EUFORGEN Technical Guidelines translated into national languages by the countries (**X** denotes guidelines translated in 2012, X those translated earlier).

Species	Dutch	French	German	Italian	Slovenian	Spanish
Abies alba		X		X	X	X
Acer campestre				X	**X**	
Acer pseudoplatanus				X	**X**	
Alnus glutinosa				X	**X**	
Betula pendula					**X**	
Castanea sativa				X	**X**	X
Fagus sylvatica					X	
Fraxinus excelsior				X	**X**	
Larix decidua					**X**	
Malus sylvestris / Pyrus pyraster				X	**X**	
Picea abies				X	X	
Pinus halepensis / P. brutia				X		X
Pinus nigra		X		X	**X**	X
Pinus pinaster		X		X		
Pinus pinea				X		X
Pinus sylvestris					X	
Populus nigra	X	X	X	X	X	X
Populus tremula					**X**	
Prunus avium				X	X	
Quercus petraea / Q. robur		X		X	X	X
Sorbus domestica				X	**X**	
Sorbus torminalis				X	**X**	
Tilia spp.				X	**X**	
Ulmus laevis		X			**X**	

3.4. European information system on forest genetic resources (EUFGIS)

The EUFGIS portal (http://portal.eufgis.org) makes available geo-referenced data on the dynamic conservation units of forest trees in Europe. The data is provided and frequently updated by national focal points based on pan-European minimum requirements and data standards for these units. The dataset for each unit consists of 26 unit level and 18 population level data standards. Before entering the data into the database, the national focal points must check that a given unit meets the pan-European minimum requirements for these units. The data standards and the minimum requirements were developed during the EUFGIS project (2007–2011), and they have been endorsed by the EUFORGEN Steering Committee. The minimum requirements also explain how the units should be managed so that they contribute to the dynamic conservation of forest genetic resources. The portal was launched in September 2010 and it has been maintained and further developed by EUFORGEN after the EU-supported project ended in March 2011.

In 2012, the national focal points in several EUFORGEN member and associated countries continued compiling new data on the units and uploading the data into the EUFGIS portal. A total of 259 new units with 265 tree populations were added to the database in 2012 (a unit may be managed for genetic conservation of one or more tree species). At the end of 2012, the EUFGIS portal contained data on 2,628 units, which are managed for the genetic conservation of 96 tree species, including introduced tree species. The units harboured a total of 3,419 tree populations. The number of data providing countries (31) as well as countries with national focal points (36) remained the same as in 2011. National focal points have been nominated by Austria, Belarus, 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.

4. Activities of the EUFORGEN Steering Committee

The Steering Committee held its eighth meeting in Paris, France on 27–29 November 2012 during which it reviewed the progress made in the implementation of EUFORGEN Phase IV in addition to reviewing the draft reports of the three working groups. The Steering Committee also discussed several technical and policy issues by email and continued these discussions at the eighth meeting. The following chapters summarize the main activities and discussion points of the Steering Committee in 2012.

4.1. Review of progress made during 2010–2012

During its eighth meeting, the Steering Committee reviewed the technical and financial reports for 2010–2011 and discussed the 2012 update presented by the EUFORGEN Secretariat. The Steering Committee noted that EUFORGEN has made good progress in its activities despite of some delays that occurred in 2010. It also thanked the Secretariat for the prudent management of financial resources. Concerning the reduced number of member countries, the Steering Committee recommended that the Secretariat continue discussions with all those Phase III member countries which have not yet joined Phase IV and urge them to join EUFORGEN again.

The Steering Committee adopted the technical and financial reports for 2010–2011. It also decided that, in the future, the annual technical and financial reports should be sent to the member countries through National Coordinators. They should then forward the reports to the relevant ministries or other funding bodies and also make sure that the reports are received by relevant officers. This is to avoid any disruptions in the reporting and funding efforts. All National Coordinators were also urged to inform the Secretariat on any problems related to the financial contributions as soon as possible.

4.2. Forest genetic resources and the negotiation process for a legally binding agreement on forests in Europe

The Steering Committee discussed the draft text for a legally binding agreement on forests in Europe during its meeting in November 2012. The draft text was developed by the Intergovernmental Negotiating Committee (INC), which held two sessions in 2012. The Steering Committee noted that the draft negotiating text does not make any reference to FGR or genetic diversity despite the fact that one of the first FOREST EUROPE commitments (Strasbourg Resolution 2) specifically requested countries to improve FGR conservation and called for the establishment of a international instrument (i.e. EUFORGEN) to promote and coordinate this work at the pan-European level. Several National Coordinators pointed out that the draft text on forest biodiversity was rather general and that it does not recognize that different measures or actions may be needed for conserving the three levels of biological diversity as part of sustainable forest management. The Steering Committee considered that the agreement should make a specific reference to FGR conservation in the biodiversity-related paragraphs. It also stressed that FGR conservation is not only an ecological issue but also an economic one. Therefore, the Steering Committee noted that the agreement should also promote appropriate use of FGR, as the long-term sustainability of forestry ultimately depends on the amount of genetic diversity maintained within the existing tree populations and the genetic material used for regenerating forests.

To emphasize these aspects, the Steering Committee developed, in collaboration with the Secretariat, a written statement to the third session of the Intergovernmental Negotiating Committee (INC3) which was held in Antalya, Turkey on 28 January–1 February 2013. The statement was presented to the INC3 session by the EUFORGEN Coordinator. The text of the agreement is expected to be finalized at the fourth and last INC session which will be held in Poland in June 2013. The adoption of the agreement will be then discussed by ministers responsible for forests at the extraordinary ministerial conference which will be organized in Madrid, Spain in autumn 2013.

4.3. Community Programme on genetic resources in agriculture

The European Commission (Directorate-General for Agriculture and Rural Development) organized the 26th meeting of the Committee on Council Regulation 870/2004 on the conservation, characterisation, collection and utilization of genetic resources in agriculture (AGRI GEN RES) in Brussels on 13 June 2012. The EC invited EUFORGEN to provide written inputs to the discussions on a possible new AGRI GEN RES programme. The members of the Steering Committee sent their ideas to the EUFORGEN Secretariat which then sent the written inputs by email to the EC on 8 June 2012.

The Steering Committee noted that the objectives of the previous AGRI GEN RES programme are still relevant, and that further actions are needed to enhance the conservation and use of genetic resources in Europe. Therefore, the Steering Committee urged the EC to launch a new AGRI GEN RES Programme (or a similar instrument) and to explore possibilities to increase funding allocated for this work. It also suggested that a new AGRI GEN RES programme should focus on supporting actions that add value at the EU level, or even at the pan-European level as the distribution of valuable genetic resources do not respect EU borders.

More information on the previous AGRI GEN RES programme is available on the website of the DG Agriculture and Rural Development (http://ec.europa.eu/agriculture/genetic-resources/index_en.htm).

4.4. Other relevant initiatives of the European Commission

In November 2012, the Steering Committee discussed several other EC initiatives that are relevant to FGR, namely the development of: (1) a new EC Regulation for rural development, (2) a draft EC Regulation on plant reproductive material, and (3) a new EU Forest Strategy.

The Steering Committee exchanged views on the draft EC Regulation for rural development and decided to propose to the EC that it would be useful to list specific activities on FGR under the eligible forestry measures. It was proposed that the following areas of work should be included in the new EC Regulation: (1) management of existing genetic conservation units of forest trees, (2) establishment of new genetic conservation units, and (3) inventories and genetic monitoring of the units. This proposal was then communicated to national EU representatives and relevant EC officers by several National Coordinators.

Concerning the development of the new EC Regulation on plant reproductive material, the Steering Committee noted that it would have some negative effects on the forest sector. The goal of the EC is to merge the existing 12 directives on reproductive material (11 of them dealing with seeds of agricultural crops and one focusing on forest trees) into a single regulation. The Steering Committee members exchanged views on this issue supporting the opinion of the Standing Forestry Committee which had earlier stated that the existing regulation on FRM should not be merged with those dealing with crop seeds. The planned new regulation is likely to compromise the quality and traceability of FRM, as producers are expected to cover the full costs of registration and certification of the material to relevant authorities. There are also concerns on how well producers can cope with new responsibilities to ensure the traceability of the material. The Steering Committee agreed to develop a statement on the new EC regulation based on technical and scientific arguments. The development of the statement continued by email and it was finalized in early 2013. The statement was then sent to the EC by the EUFORGEN Secretariat on 18 March 2013.

Regarding the new EU Forest Strategy, the Steering Committee recommended that National Coordinators in the EU Member States should keep their national representative in the EU Standing Forestry Committee informed about the work of EUFORGEN. Furthermore, it recommended that the EUFORGEN Secretariat follow up the process and circulate the new strategy once it is finalized so that the Steering Committee can then discuss what specific actions on FGR could be proposed to a new EU Forest Action Plan.

4.5. State of the World's Forest Genetic Resources report

The Steering Committee was briefed by FAO on the development of the State of the World's Forest Genetic Resources (SoW-FGR) report and possible follow-up options once the report has been finalized. The Steering Committee expressed its appreciation to FAO for keeping EUFORGEN updated on this process. Several members of the Steering Committee were surprised about the fact that only 13 European countries had submitted their reports to FAO (as of November 2012). The

Steering Committee recommended that National Coordinators in those countries which have not yet submitted their reports should follow up this issue urgently after the meeting.

The Steering Committee acknowledged the work done by FAO in preparing the SoW-FGR report and welcomed the proposed development of the Global Plan of Action on FGR as a follow-up option. The Steering Committee also expressed the readiness of EUFORGEN to contribute to the development and implementation of such a global work plan in Europe and to continue its collaboration with FAO.

4.6. Development of EUFORGEN Work Plan (2013–2014)

During its eighth meeting, the Steering Committee developed a new work plan for 2013–2014 (see the report of the eighth meeting for details). It includes further guidance for the three existing working groups and deadlines for the finalization of the draft reports in 2013. Furthermore, the Steering Committee decided to establish two new working groups to address FGR-related policies and genetic conservation of forest trees under climate change. It also agreed tasks and deadlines for the new working groups.

The working group on FGR-related policies should review relevant results of the earlier Forest Management Network and consider the impacts on FGR conservation and use at the national and European levels of the Nagoya Protocol and possible sector-specific arrangements on access and benefit sharing, as well as the possible legally binding agreement on forests in Europe. Furthermore, the working group should prepare advice on FGR conservation and use for policymakers responsible for the development and revision of national forest programmes.

The working group on FGR and climate change was tasked to address both *in situ* and *ex situ* conservation in the context of climate change. It should also identify most vulnerable tree populations and conservation units, analyze the level of duplication needed in conservation efforts and further explore the idea of establishing conservation units outside the current distribution ranges of tree species. The working group is then expected to develop recommendations for the management of both units and networks of the units, and for developing complementary *ex situ* measures.

Both new working groups were requested to present an update of their discussions to the ninth meeting of the Steering Committee (2013) and prepare a draft report for the tenth meeting (2014).

5. Activities of the EUFORGEN Secretariat

5.1. Inputs to the working group and workshops

The Secretariat coordinated the activities of the three working groups and took care of the practical arrangements for the five working group meetings that took place in 2012. Furthermore, the Secretariat staff contributed to the preparation of the draft reports of the working groups and carried out supporting literature reviews and GIS analyses. In 2012, the Secretariat also organized two

European workshops in collaboration with the FORGER project and prepared the summary reports of these meetings.

5.2. Maintenance of the EUFGIS portal and related activities

The Secretariat continued providing helpdesk support to the EUFGIS national focal points in 2012. It also implemented most of the changes to the EUFGIS portal and database that were suggested by the national focal points during the workshop on FGR inventories held in Hungary in May 2012. Furthermore, the Secretariat developed and released a new intranet of the EUFGIS portal. Additional work to improve the EUFGIS portal was carried out as part of the FORGER project (see next section).

The Secretariat continued screening the quality of the data entered into the EUFGIS database and communicated any observed inconsistencies or problems in the national datasets to the national focal points for their action. The Secretariat also delivered a presentation on the EUFGIS Portal and demonstrated it use during the annual meetings of the German Federal Working Group on FGR (Großhansdorf, 8 November 2012) and the French Commission on FGR (Paris, 26 November 2012).

5.3. FORGER project

In 2010–2011, Bioversity International contributed to the development of a project proposal for a call (KBBE.2011.1.1-04: Sustaining and managing forest tree genetic resources) under the EC's Knowledge Based Bio-economy (KBBE) Programme. The proposal, entitled *Towards the Sustainable Management of Forest Genetic Resources in Europe (*FORGER*),* was submitted to the EC in January 2011 and it was accepted in May 2011. The grant agreement with the EC was signed in December 2011 and the project was started in March 2012 for a period of four years. The total budget of the project is € 3.8 million of which the EC contribution is € 3 million. The project is coordinated by Alterra (The Netherlands) and the consortium includes BFW (Austria), Metla (Finland), INRA (France), vTI (Germany), EMK (Hungary), CNR (Italy) and UKW (Poland) in addition to Bioversity.

The project aims to integrate and extend existing knowledge to provide science-based recommendations on the management and sustainable use of FGR for the EC, policymakers, forest managers, and managers of protected areas. The project has five objectives: (1) improve and analyze FGR inventories in Europe, (2) develop a common protocol for measuring and monitoring genetic diversity, (3) analyze past, current and future use and management of FGR, (4) provide improved tools, guidelines and recommendations, and (5) disseminate and communicate the results to stakeholders.

Bioversity leads the work package on communication, dissemination and knowledge transfer and contributes to two other work packages (one on improving FGR inventories in Europe and the second one developing tools, guidelines and recommendations). EUFORGEN is considered one of the key stakeholders of the project and the Secretariat is involved in the implementation of the above-mentioned work packages. Furthermore, the EUFORGEN Steering Committee was invited to nominate two National Coordinators to serve in the External Advisory Board of the project.

The collaboration with the project benefits EUFORGEN in several ways. First, the project provides additional financial resources for further improvement of the EUFGIS portal, including creating a linkage to the GD² database, which provides geo-referenced data on the genetic diversity of tree populations which have been sampled by earlier European research projects. This makes it easier to characterize the genetic diversity conserved within and nearby the genetic conservation units as the EUFGIS database does not contain any genetic data. The project is also testing genetic monitoring methods in the field and its results will be useful to further EUFORGEN work to create the pan-European genetic monitoring system for the conservation units. Secondly, the project will support organization of several joint meetings with EUFORGEN. Furthermore, the key target groups of the project for dissemination and knowledge transfer include the EUFGIS national focal points as well as the EUFORGEN Steering Committee, working groups and experts.

In 2012, three EUFORGEN meetings were organized in collaboration with the project. These included the workshop on FGR inventories organized in Szombathely, Hungary in May 2012, the workshop on FGR conservation and monitoring held in Järvenpää, Finland in September 2012 and the second meeting of the working group on FRM, which was held in Freising, Germany in July 2012. After the workshop on FGR inventories in May 2012, the database specialists of Bioversity and INRA started developing a joint search protocol for the EUFGIS and GD² databases. This work included creating new interfaces and cache databases to enable communication between the two databases. The web servers at Bioversity and INRA also needed some configuration. The joint search protocol will operate based on tree species and coordinates of tree populations in the two databases. It will be finalized in early 2013. Further information on the project is available on the FORGER website (www.fp7-forger.eu).

5.4. Inputs to the FOREST EUROPE process

The EUFORGEN Coordinator attended the expert-level meeting of the FOREST EUROPE process in Madrid, Spain on 14–15 February 2012 and provided inputs to the development of a new FOREST EUROPE work programme. EUFORGEN was included in the new work programme as one of the international activities supportive to the follow-up of the Oslo Ministerial Conference held in June 2011. The work programme is available on the FOREST EUROPE website (www.foresteurope.org).

5.5. The negotiation process for a legally binding agreement on forests in Europe

In February 2012, Bioversity requested observer status in the Intergovernmental Negotiating Committee (INC) for Legally Binding Agreement on Forests in Europe. The INC granted this status to Bioversity and 22 other organizations during its first session held in Vienna, Austria on 27 February–2 March 2012. Subsequently, the EUFORGEN Coordinator attended the second session of the INC which was organized in Bonn, Germany on 3–7 September 2012. The reports of the INC1 and INC2 sessions as well as the draft negotiation text are available from the INC website (www.forestnegotiations.org).

5.6. Collaboration with the European Union

In January 2012, the EUFORGEN Secretariat provided inputs to two surveys conducted by the Directorate-General for Agriculture and Rural Development of the EC. The first one was a stakeholder consultation on genetic resources in agriculture (including forestry). This survey was designed to identify current and future needs, and to explore measures to meet them. It was sent to stakeholders dealing with genetic resources in agriculture (national administrations; international and European organisations, including farmer and breeder organisations; agricultural and environmental NGOs; and organizations in the seed sector and food/feed processing and retailing).

The second survey was sent to all coordinators of the 17 projects co-funded by the previous AGRI GEN RES Programme in 2006–2011 (the EUFGIS project was funded under this programme). The survey focused on collecting feedback on the work done as part of the projects and how the administration of future AGRI GEN RES projects could be improved. It also identified needs for further action on different types of genetic resources in Europe. The survey results were also used for the external evaluation of the AGRI GEN RES Progamme, which was conducted in early 2012.

In June 2012, the Secretariat developed, in collaboration with the Steering Committee, a written statement as an input to the 26th meeting of the Committee on Council Regulation 870/2004 on the conservation, characterisation, collection and utilization of genetic resources in agriculture, held in Brussels on 13 June 2012. After that, the Secretariat was in contact with relevant EC officers and reported the outcomes of the June meeting to the EUFORGEN Steering Committee in November 2012.

In October 2012, the Secretariat provided inputs to the EC for the development of a publication on the results of the 17 projects which were implemented as part of the AGRI GEN RES programme in 2006–2011. The publication will be released by the EC in 2013.

5.7. Publications and public awareness efforts

In 2012, the Secretariat led the finalization of a review paper based on the pan-European minimum requirements for genetic conservation units of forest trees that were developed during the EUFGIS project (2007–2011). The Secretariat also provided inputs to the finalization of the case studies that were started during the project. The review paper and two case studies were accepted for publication in scientific journals in 2012 (see Annex 1 of this report for details). A third case study, which analyzes the vulnerability of the genetic conservation units to climate change, is expected to be finalized in 2013.

Brief news updates on forest genetic resources in Europe were released on the EUFORGEN and EUFGIS websites. National Coordinators were also asked to provide content for the country pages of the EUFORGEN website. Publications and other relevant national information are also displayed on the country pages.

The Secretariat staff interviewed selected experts and National Coordinators during the first meeting of the working group on genetic monitoring in January 2012, the workshop on FGR conservation and monitoring in September 2012 and the Steering Committee meeting in November 2012. The

collected audio and video material was edited after these meetings and a total of six interviews were published on the EUFORGEN website. Some new features (e.g. archives of interviews and news, and subscription of the news via RSS feeds) were also added to the website. In addition, a YouTube account was created for displaying the EUFORGEN videos.

On 17 September 2012, the Finnish Forest Research Institute organized a field visit to a genetic conservation unit of common ash (*Fraxinus excelsior*) in Hyvinkää, near Helsinki for a group of journalists. The Secretariat also contributed to this field visit which served as a "field press conference" to the workshop on FGR conservation and monitoring. Several newspapers in Finland published articles on FGR conservation as a result of this field visit.

5.8. Other activities

On 19–21 April 2012, an international conference on the role of DNA banks in research and conservation of forest biodiversity was organized in Viterbo, Italy. The conference organizers at the University of Tuscia invited the EUFORGEN Coordinator to participate in the conference and also co-chair one session. The abstracts of the conference presentations are available at the following website (http://www.medna-bank.eu/images/documents/book_of_abstracts.pdf).

The EUFORGEN Coordinator participated in a workshop on access and benefit sharing for genetic resources for food and agriculture in Bonn, Germany on 27–28 June 2012. The workshop was organized by Denmark, Germany and the Netherlands for the European Regional Group of the FAO Commission on Genetic Resources for Food and Agriculture (CGRFA). The purpose of the workshop was to prepare European inputs to the first meeting of the Ad Hoc Technical Working Group on ABS (WG-ABS) of the CGRFA that was held from 10 to 13 September 2012 in Longyearbyen, Svalbard. The workshop elaborated and consolidated viewpoints of different subsectors (plant, animal, forest, aquatic and microbial and invertebrate genetic resources) regarding ABS issues. The results of the workshop were reported to the 14th Session of the CGRFA, held in Rome on 15–19 April 2013. A document based on the workshop discussion is available on the CGRFA website (http://www.fao.org/docrep/meeting/026/ap539e.pdf).

6. Wider influences of EUFORGEN

6.1. EVOLTREE Network

In 2012, the EUFORGEN Secretariat continued its collaboration with the EVOLTREE Network (Evolution of Trees as Drivers of Terrestrial Biodiversity) which operates under the European Forest Institute (EFI). The EVOLTREE Network maintains the common research infrastructures (databases and intensive study sites) which were established during the EC-funded project of the same name in 2006–2010 and provides training (short courses and summer schools). Currently the Network has 23 member institutes (including Bioversity International) and all interested institutes are welcome to join it. Further information on the EVOLTREE activities is available from its website (www.evoltree.eu).

6.2. FORESTTRAC project

In 2010–2011, the EUFORGEN Secretariat collaborated with the FORESTTRAC project (Forest Ecosystem Genomics Research: Supporting Transatlantic Cooperation), which was a coordination and support action funded by the EC seventh framework programme for research. The main aim of the project is to prepare a strategic research roadmap between Europe and North America on the adaptation of forest trees to climate change. The project was coordinated by INRA (France) and it had a total of 11 partners from Europe, Canada and the USA, including Bioversity.

In early 2012, the project partners finalized the strategic research roadmap for which the Secretariat also provided some inputs. The research roadmap and other project outputs are available on the FORESTTRAC website (www.foresttract.eu).

7. Financial summary for 2012

In January 2012, the opening balance of the EUFORGEN trust fund was US$ 195,290. During 2012, Bioversity International received a total of US$ 335,250 as financial contributions from member countries. In December 2012, the outstanding contributions for Phase IV were US$ 26,750 (Greece, Hungary and Romania) and US$ 33,700 for Phase III (2005–2009) (Georgia, Iceland, the Former Yugoslav Republic of Macedonia, Moldova and Portugal). The Secretariat has reminded these countries regarding their outstanding financial contributions.

In 2012, the Secretariat continued prudent management of the financial resources as the number of member countries (25) was still lower than expected (31). Several meetings were organized in collaboration with the FORGER project and this allowed sharing of some costs (i.e. Secretariat staff time, and travel and meeting costs).

The planned budget for 2012 was US$ 436,180 but the actual total expenditure in 2012 was only US$ 327,964. The closing balance of the trust fund was US$ 202,576 on 31 December 2012 and it was carried forward for 2013. A detailed financial report for 2012 is available as a separate document and has been sent to the member countries.

Annex 1: Publications and reports in 2012

Reports of EUFORGEN working groups

de Vries SMG, Alan M, Bozzano M, Burianek V, Collin E, Cottrell J, Ivankovic M, Kelleher C, Koskela J, Rotach P, Vietto L, Yrjänä L. Pan-European strategy for genetic conservation of forest trees: establishment of a core network of dynamic conservation units (draft report). EUFORGEN working group on genetic conservation strategies. 23 p.

Aravanopoulos FA, Tollefsrud MM, Kätzel R, Soto A, Graudal A, Nagy L, Koskela J, Bozzano M, Pilipovic A, Zhelev P, Božič G. Development of genetic monitoring methods for genetic conservation units of forest trees in Europe (draft report). EUFORGEN working group on genetic monitoring. 30 p.

Konnert M, Fady B, Gömöry D, A'Hara S, Wolter F, Ducci F, Koskela J, Bozzano M, Maaten T, Kowalczyk J. Use and transfer of forest reproductive material in Europe in the context of climate change (draft report). EUFORGEN working group on forest reproductive material. 46 p.

Publications resulting from EUFORGEN/EUFGIS work

Schueler S, Kapeller S, Konrad H, Geburek T, Mengl M, Bozzano M, Koskela J, Lefèvre F, Hubert J, Kraigher H, Longauer R, Olrik, DC. Adaptive genetic diversity of trees for forest conservation in a future climate: a case study on Norway spruce in Austria. Biodiversity and Conservation (published online in June 2012).

Koskela J, Lefèvre F, Schueler S, Kraigher H, Olrik DC, Hubert J, Longauer R, Bozzano M, Yrjänä L, Alizoti P, Rotach P, Vietto L, Bordács S, Myking T, Eysteinsson T, Souvannavong O, Fady F, De Cuyper B, Heinze H, von Wühlisch G, Ducousso A, Ditlevsen B. Translating conservation genetics into management: pan-European minimum requirements for dynamic conservation units of forest tree genetic diversity. Biological Conservation (published online in November 2012).

Lefèvre F, Koskela J, Hubert J, Kraigher H, Longauer R, Olrik DC, Schueler S, Bozzano M, Alizoti P, Bakys R, Baldwin C, Ballian D, Black-Samuelsson S, Bednarova D, Bordács S, Collin E, De Cuyper B, de Vries SMG, Eysteinsson T, Frýdl J, Haverkamp M, Ivankovic M, Konrad H, Koziol C, Maaten T, Notivol Paino E, Öztürk H, Pandeva ID, Parnuta G, Pilipovič A, Postolache D, Ryan C, Steffenrem A, Varela MC, Vessella F, Volosyanchuk RT, Westergren M, Wolter F, Yrjänä L, Zarina I. Dynamic conservation of forest genetic resources in 33 European countries. Conservation Biology (published online in December 2012).

Other publications

Kremer A, Baker A, Bousquet J, Cervera MT, Fluch S, Koskela J, MacKay J, Neale D, Ritland K, Savolainen O, Vinceti B, Wheeler N, Whitham T. 2011. A roadmap for future transatlantic research cooperation on adaptation of forest trees to environmental change. Document prepared for the European Commission by the FORESTTRAC project. 28 p.