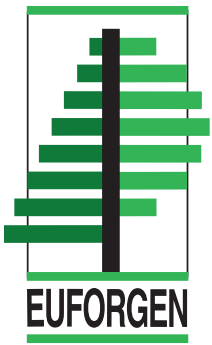




Forest Management Network

Summary of the Fourth meeting

Leuven, Belgium, 4–6 November 2008



European Forest Genetic Resources Programme (EUFORGEN)

Summary of the meeting

Opening of the meeting

J. Hubert, Chair of the Network opened the meeting and welcomed all participants to Leuven. On behalf of the local organizers, J. Van Slycken, EUFORGEN National Coordinator of Belgium also welcomed the participants to Belgium and gave a brief introduction to forest management in the three regions of Belgium (Flanders, Walloon and Brussels). He noted that increasing efforts on monitoring of forest genetic diversity have been included into the new work plan of the Flanders region. He also thanked B. Van Der Aa and her colleagues for taking care of the practical arrangements of the meeting. J. Koskela, EUFORGEN Coordinator welcomed the participants on behalf of the EUFORGEN Secretariat and introduced the meeting agenda, which was then adopted without changes. D. Paitaridou and J. Fennessy were selected as rapporteurs of the meeting.

EUFORGEN update

J. Koskela provided an update to EUFORGEN and other relevant activities. He started by briefing the work of the MCPFE process (Ministerial Conference on the Protection of Forests in Europe). He reminded the participants on the outcomes of the fifth Ministerial Conference on the Protection of Forests in Europe (MCPFE), held in Warsaw, Poland in November 2007. He also summarized some key points of the Warsaw Declaration and the two Resolutions (i.e. Forests, Wood and Energy; Forests and Water).

In January 2008, Poland handed over the coordinating responsibility of the MCPFE process to Norway and a new Liaison Unit has been set up at the Norwegian Forest and Landscape Institute in Ås, near Oslo. The new Liaison Unit organized its first expert level meeting in Oslo on 7-8 May 2008. The meeting discussed a new work programme to implement the Warsaw commitments and actions to define the strategic direction of the MCPFE process.

The activities included in the new work plan are structured around the following topics; 1) sustainable forest management and climate change, 2) wood mobilization and sound use of wood, 3) multiple forest ecosystem services, including forests and water, 4) regional-global cooperation and partnership, and 5) cross-cutting activities, such as monitoring of progress in implementing sustainable forest management in Europe. The work plan also includes a list of international activities supportive to the follow-up of the Warsaw Conference, mentioning both EUFORGEN and EUFGIS.

J. Koskela informed the participants that the next expert level meeting will be held in Geneva, Switzerland on 12-13 Nov 2008. Its agenda includes a revised draft of the pan-European guidelines for afforestation and reforestation, and future steps of two working groups; one on sustainability criteria for forest biomass production and another one on exploring possibilities for legally binding instrument on forests in Europe.

He then reported some activities of the European Forest Week (20-24 October 2008) during which over 100 forest-related events were organized in 30 countries. At regional level, various events were organized jointly by the UN Food and Agriculture Organization (FAO), the UN Economic Commission for Europe (UNECE), MCPFE and the European Commission at the FAO headquarters in Rome on 21-24 October. The events were built around the 66th session of the UNECE Timber Committee and 34th session of the European Forestry Commission of FAO and attended by more than 400 participants from 45 countries. The purpose of the European Forest Week was to increase the visibility of forests and the forest sector, and raise awareness about their importance. Further information can be found on the event's website (www.europeanforestweek.org) or in a summary report published by the International Institute for Sustainable Development (IISD)(www.iisd.ca/yimb/efw/).

On 21 October 2008, Bioversity International organized a side event on adaptation of forest trees to climate change to highlight the importance of forest genetic resources. During the event, J. Koskela presented recommendations of the Paris workshop on climate change and forest genetic diversity. Furthermore, B. Fady (INRA-Avignon, France) gave a presentation on adaptation of trees and J. Hubert delivered another presentation on how to use forest genetic resources in the face of climate change.

J. Koskela continued by briefly highlighting the outcomes of the Scattered Broadleaves Network (Norway, 20-22 May 2008) and the Conifers Network (Hungary, 10-12 June 2008) meetings. The major activities of both Networks include development of common action plans and additional Technical Guidelines.

Regarding the EUFGIS project (Development of a European Information System on Forest Genetic Resources), J. Koskela informed the meeting that the expert group had met twice (in France on 8-9 April 2008 and in Slovenia on 1-3 October 2008) after the previous Network meeting. The task of the expert group is to develop pan-European minimum requirements and data standards for dynamic gene conservation units of forest trees. T. Eysteinnsson represents the Forest Management Network in the expert group.

Finally, he briefed the participants on the preparatory process for the development of a State of World's FGR report by FAO. In 2008, FAO drafted a brief outline document to describe the process and sought feedback from countries by organizing two regional consultations in Costa Rica (September) and in Malaysia (October). The consultations were held in collaboration with Bioversity, the Latin America Forest Genetic Resources Programme (LAFORGEN) and the Asia Pacific Forest Genetic Resources Programme (APFORGEN). The 15th Session of the FAO Panel of Experts on FGR will further discuss the process in Rome on 9-11 December 2008. The EUFORGEN Secretariat has been working closely with FAO on this effort and it will collect feedback from European countries once FAO has prepared a new draft of the outline document.

A proposal for the structure and content of the SOW-FGR report will be discussed by the FAO Committee on Forestry in March 2009. In October 2009, the next Session of the Commission on Genetic Resources for Food and Agriculture should then endorse the plan for developing the SOW-FGR report and provide funding for it. The global report is expected to be published by 2013.

EUFGIS update

J. Koskela continued by presenting more detail information on the development of the pan-European minimum requirements and data standards for dynamic gene conservation units of forest trees as part of the EUFGIS project. In 2007, the EUFGIS workshop made several recommendations for the expert group and subsequently the expert group started its work by reviewing the workshop outputs and the existing species-specific minimum requirements (conifers, scattered broadleaves and stand-forming broadleaves) developed by the EUFORGEN Networks. The expert group also took note of other existing data standards, developed earlier by EUFORGEN (e.g. descriptors for inventories of black poplar stands and basic inventory requirements for noble hardwoods).

The draft minimum requirements indicate that each unit should have one or more tree species recognised as *target species* for gene conservation efforts. The units should be predominantly located in autochthonous tree populations but additional *ex situ* units can also be included if they represent well-adapted forests. Units of introduced tree species can be included if they are established for conserving well-identified and differentiated characteristics from their original source populations. Seed stands can also be considered as gene conservation units but only those ones fulfilling the minimum requirements.

Regarding the minimum population size, a unit should have either 500 or more reproducing trees (widely occurring and stand-forming conifers and broadleaves), 50 reproducing trees (scattered conifers and broadleaves) or 50 seed bearing trees (dioecious tree species with sexual dimorphism) or 15 unrelated reproducing trees (rare or endangered tree species in specific situations only). The draft document also gives guidelines for the management and monitoring of the units.

The data on the units will be collected at two different levels; general data on the units and more detailed data on each target tree species within a unit. In addition to the identification data of the units in each country, the data standards include geographical coordinates of the unit, minimum and maximum elevation within the unit, surface area, ownership, type and function of the unit and predominant silvicultural system. For each unit, climatic variables will be obtained based on the geographical coordinates using common sources and extrapolating methods (e.g. WORLDCLIM). Additional fields will be available for remarks (e.g. specific soil and other characteristics).

The data standards on each target tree species include Latin name, the origin of the material, the total number of reproducing trees per unit, remarks on sex ratio (in case of dioecious species), regeneration and distribution of the reproducing trees in the unit. Furthermore, the data standards include additional information on the reason why the unit was established (e.g. conserving the genetic diversity of the target species, specific adaptive traits or remaining individuals of rare/endangered species).

J. Koskela concluded that the final draft of the pan-European minimum requirements and data standards will be circulated for comments to all EUFORGEN Networks once the expert group has agreed the final details.

Updates on the Network activities

Publication on genetic aspects of forest management

J. Koskela presented a draft outline of the publication on genetics aspects of forest management. At the previous Network meeting, it was decided to develop this publication based on relevant findings of the review carried out by A. Valadon in France. It is targeted at managers and policy makers, and it should address specific topics, such as seed collection, use of forest genetic resources (raising plants and planting) and silvicultural practices (thinning, felling, etc.). It should also include climate change considerations related to the above-mentioned topics.

The participants discussed the draft outline and noted that the selection of a regeneration method has the most far-reaching genetic consequences of all forest management practices. Thus it was proposed that the structure of the publication should be built around the selection of the regeneration method (natural versus artificial) instead of starting from seed production and then describing the genetic consequences of the subsequent silvicultural chain. It was agreed that the previous working group should meet in the evening and develop a new outline for discussion during the second day of the meeting (see below the chapter on the new work plan).

Cross-Network publication on forest management and FGR

J. Koskela presented a table of contents for this publication which includes different chapters from all EUFORGEN Networks. In 2007, the Inter-Network meeting of Chairs and Vice-Chairs agreed that it would be useful to publish the outcomes of various activities the Networks have been carrying out on this broad issue as a joint publication.

The inputs from the Forest Management Network include 1) the survey results on relevant policies and practices related to gene conservation and forest management (the working group led by T. Eysteinnsson), 2) the survey on tools to promote the use of high quality forest reproductive material in Europe (B. Ditlevsen), and 3) the findings of the working group which collected examples of inappropriate use of FRM (led by A. Valadon). It was agreed that the results of the third activity will be incorporated into the chapter on high quality FRM. The new deadlines for finalizing the chapters was discussed during the second day (see later in this summary report).

Economic aspects of FGR: results of the first phase of the Danish project

B. Ditlevsen provided an update to the Danish project on economic valuation of forest genetic diversity. The results of the pilot phase (A. Skovmand Bosselmann et al., Forest & Landscape Working Papers 31/2008) were published at the end of October and an electronic copy of the report was circulated to the participants. The pilot study focused on methodologies for assessing the economic value of the improved genetic material and genetic diversity.

B. Ditlevsen started by noting that economic value is generated through genetic resources programmes (tree improvement, seed production and gene conservation) as well as by forest managers (selection of species or mixture of species, and provenances, seed sources, or clones). Traditionally, the economic value or gain has been assessed by comparing investments made to tree improvement and returns from higher growth or increased use of the material. This kind of valuation is based on an assumption that growing conditions are known and stable (e.g. climate).

He pointed out that the usefulness of the traditional approach in the face of climate change can be questioned and that more attention should be paid to genetic diversity as it is the best tool to counter climate change and to hedge against uncertainty. Decision making under uncertainty can basically rely on different approaches, i.e. 1) reduce risk through diversification (e.g. increasing the use of genetic diversity or mixing species), 2) apply dynamic, reactive decision making (e.g. a mix of forest management practices applied in a given area), and 3) apply dynamic, forward-looking decision making and adaptive management (e.g. delaying a decision creates an option value, i.e. the 'value of waiting').

He then summarized some preliminary results of the pilot study based on genotype-climate interaction data from clonal tests of Norway spruce in Denmark and southern Sweden (14 clones). He concluded that the preliminary results do not yet provide adequate picture regarding the economic value and the amount of genetic diversity. There are still several questions which need to be analyzed in more detail, such as the value of genetically diverse or narrow seed sources and the value of mixing provenances.

Recent developments in forest management issues in Europe

J. Hubert opened the session and pointed out that there are a number of ongoing initiatives on forest management in Europe that are relevant to the Network. He then asked J. Koskela to provide further details on various efforts (i.e. the afforestation and reforestation guidelines and the sustainability criteria for forest biomass production (both by MCPFE), and the IUFRO review on climate change and forests (to be published in spring 2009)). The new draft of the afforestation and reforestation guidelines and the terms of reference for the MCPFE working group on the sustainability criteria had been circulated to the participants before the meeting.

Regarding the afforestation and reforestation guidelines, several participants raised some concerns on the content of the guidelines. They pointed out that the ecological part of the document, encouraging the use of native tree species and provenances, are likely to be understood in a way that the MCPFE process is discouraging the transfer of FRM in the face of climate change or the use of introduced tree species. It was also noted that if a tree species is an introduced one, it does not automatically mean that it is also invasive and harmful. In many European countries, such as Iceland, Ireland and the UK, introduced tree species have an important role in forestry and these species have also brought environmental benefits. It was suggested that the EUFORGEN Secretariat should address these concerns in the next

MCPFE expert level meeting and that the Network members should also discuss these issues with their national MCPFE representatives.

Following the discussion on the sustainability criteria, it was agreed to develop a list of key genetic issues that should be forwarded to the attention the MCPFE working group when it continues its work. The meeting identified gene flow and pathogens as important issue in this regard. The sustainability criteria should address the risk of reduced adaptability as a result of introgression of genes from introduced material or genetically modified trees to natural tree populations. Regarding pathogens, it was stressed that the selective pressure on them is different in tree plantations as compared to natural tree populations. This may facilitate the spread of new strains of pathogens from plantations to natural forests, as evidenced by studies with poplars and willows. In general, it was underlined that using diverse genetic material in time and space promoted sustainability of any tree planting effort. Furthermore, it is important to ensure that only FRM which meets the EC directive on the marketing of such material is used for establishing tree plantations for biomass production. Finally, the use of FRM should be well documented (i.e. what material is used and where).

Updates on relevant projects and other initiatives

EVOLTREE update

B. Vinceti presented an update to the EVOLTREE project (EVOLution of TREEs as drivers of terrestrial biodiversity) which is a consortium funded by the EC under the 6th framework programme for research. It is coordinated by A. Kremer (INRA, France) with 25 partner institutes from 15 European countries. She reminded the meeting that the primary objective of EVOLTREE is to overcome fragmentation of European research efforts and to strengthen European excellence in this area of science.

Started in April 2006, EVOLTREE is now half way through its third year and the integration activities have made significant progress. She mentioned that the samples stored at the repository centre (a centralized and automated storage unit for genomic resources established the Austrian Research Centers GmbH in Seibersdorf, Austria) is continuously growing. As of September 2008, a total 185 973 different samples of expressed sequence tags (ESTs) have been provided by partners with associated information (trees: *Fagus sylvatica*, *Picea abies*, *Pinus pinaster*, *P. sylvestris*, *Quercus petraea*, *Q. robur*, and insects: *Lymantria dispar*, *L. monacha*). In addition, a collection of reference genomic DNA from various species is being established with the objective to serve as international reference to guarantee uniform research material for association mapping studies or marker evaluations. Furthermore, an ELab online portal with a searchable interface that allows screening information related to the genomic resources available (e.g., EST sequence databases, genetic maps, information systems on the genbank resources in partner institutions) has been set up and is accessible to authorized visitors.

She further mentioned that all the datasets from the seven intensive study sites (ISSs) have been linked through an information system, accessible on the EVOLTREE webpage. This

allows easy sharing of geo-referenced thematic information between different organizations. The system contains metadata that describe the datasets available from each ISS and that is stored in a centralized, customized metadata management tool named Geonetwork.

She then gave an update to the research activities of EVOLTREE (e.g. expansion of the ESTs catalogue, full sequencing of the chloroplast genome, comparative mapping, association mapping) and reported on the preliminary results of various ongoing research projects within EVOLTREE. Detailed information on the various research initiatives is available on the website (www.evoltree.eu) and in the newsletter, downloadable from the 'Dissemination section' of the EVOLTREE webpage.

She also presented some dissemination activities of EVOLTREE. These include different sections of the EVOLTREE website (publications, newsletter and presentations) and the efforts to enhance the dialogue between stakeholders and EVOLTREE scientists. She illustrated briefly the outcomes of the first meeting of the EVOLTREE Stakeholder Group, held in conjunction with EVOLTREE Annual Meeting in Nice-Mandelieu, France in February 2008. She also informed the participants that EVOLTREE is planning to organize the second meeting of the Stakeholder Group in 2009 (June or July) and a large scientific conference on forest ecosystem genomics (tentatively planned for March 2010). She concluded by highlighting some actions of possible interest to the Forest Management Network, e.g. a review on how to incorporate climate change concerns and genomic insights into forest management).

How can the Network promote 'wise' use of forest reproductive material?

B. Ditlevsen demonstrated a new online tool which was developed in Denmark to provide information and recommendations for selecting tree species and provenances for planting in different parts of the country (www.plantevalg.dk). On the website, users can start by pointing 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 first module shows all tree species recommended for the site. By clicking a species, the user will see a list of recommended provenances of the species and after selecting one provenance, the system will show on screen a list of nearest plant suppliers for the selected species and provenance. Through the second module, users can directly select a tree species and the system will then display a list of recommended provenances. The third module shows directly a summary page of recommended species and provenances as well as an overview of plant suppliers.

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 countries as well. B. Ditlevsen added that the tool is maintained by researchers at Forest and Landscape and the plant suppliers can directly update the list of available planting material into the system. He also noted that the tool does not yet incorporate any climate change considerations to the recommendations.

The meeting then discussed the use of FRM for energy plantations; an issue the Network had already discussed during its two previous meetings. Many participants commented that it is problematic that the FRM used for energy plantations do not have to meet the requirements of the Council Directive (EC No.105/1999) on the marketing of FRM as such efforts are not considered as forestry activities in most countries. It was pointed out that it is important to have some regulation for forest energy crops but that this is entirely an EU regulatory issue. However, others noted that since these plantations are generally of short rotation, they will not have any major influence on forest genetic resources. It was also noted that the Network does not need to address this issue separately but it should provide its inputs to the MCPFE working group on sustainability criteria, as was agreed during the earlier meeting session.

Brainstorming on future activities

The participants then discussed future activities of the Network. Climate change was recognized as a topic that will continue to be relevant for EUFORGEN beyond Phase III and many participants felt that the possible next phase of the Programme should include comprehensive efforts on this topic. Others, however, emphasized that the Network should do something in this regard before the end of the current phase. It was concluded that the Network should develop an overview of climate change strategies in different countries and recommendations they provide for the use of forest genetic resources. The participants also briefly discussed other activities that should be finalized by the end of 2009. These are listed in detail in the last chapter of this summary report (finalization of the new work plan).

Regarding future activities beyond 2009, important questions are how forest trees will response to climate change and what are the limits and opportunities for future introduction of forest trees in Europe, including transfer of the exiting tree species and provenances within the continent. It was pointed out that time horizon needs to be broadened when discussing the role of native tree species and local provenances in forest management.

Defining the scope of monitoring efforts on forest genetic resources was also stressed as an important future activity. These efforts should first focus on improving monitoring of the existing gene conservation areas and only then elaborate more general genetic criteria and indicators for sustainable forest management. It was stressed that better documentation of the use of forest reproduction material would need to be promoted among forest managers. Finally, genetically modified trees were mentioned as an issue that should be addressed by the Network in the future.

Seminar on forest management issues in Belgium

*Rapid genetic delineation of provenance regions: case study of *Alnus glutinosa* in Flanders*

K. Cox presented a case study on genetic delineation of provenance regions. She noted that provenance regions are used as seed zones and they help determine which provenances are to be used in reforestation or afforestation to avoid the risk of using unsuitable ones. However, countries do not use a standard delineation method; provenance regions are often delineated for all species concerned while a more species-specific approach would be more useful. This is mainly because of practical reasons and because of a lack of relevant information. This information can be obtained through time-consuming provenance trails or genetic studies which offer a more rapid source of information.

In Flanders, the use of genetic studies was demonstrated by a case study on *Alnus glutinosa* which is a common species often used in reforestation projects. Seed was collected from 22 autochthonous populations and leaves of 10 seedlings per population were sampled for an AFLP analysis, a marker technique that was not employed before on this species. Preliminary results show that the population differentiation was low but not unusual for wind-pollinated tree species. Only one population was slightly different from the rest and this could be explained by hybridisation with *Alnus incana*. These findings need be further investigated but they suggest that one provenance region could be used for the species in Flanders.

The production of autochthonous planting stock in Flanders – the interface between conservation and utilisation

K. Vander Mijnsbrugge highlighted problems related to the production of planting stock of minor tree and shrubs species in Flanders. These species are now promoted as part of forestry and landscape projects and nurseries rely on foreign seed sources or domesticated forest reproductive material while raising the planting stock. As a result, autochthonous populations of these species are increasingly 'polluted' by non-local material. As one of the examples, she mentioned wild apple which produces abnormal fruit after cross pollination with domesticated apple trees.

The Research Institute for Nature and Forest (INBO) has initiated several efforts to improve the situation. In 1997, field inventories were initiated to locate the remaining autochthonous populations and they were completed in 2008. As a result, seeds of these populations have been collected and seed orchards established to increase the supply of autochthonous planting stock.

The truth is not important: how to reach forest managers and how to disseminate guidelines and research results

T. Embo, Director of Inverde gave a presentation on how to communicate research results to forest managers and how to influence their behaviour. Inverde is a training centre for forest, green areas and nature conservation providing practical training courses and theoretical

background knowledge (www.inverde.be). He noted that scientists usually focus too much on their standards and give too much information in their communication efforts; the result is that the message is lost and it does not reach the target audience. He stressed that it is important to focus on providing a simple and clear message, and not try to include all facts and details about a given issue. The purpose of the message is to change the behaviour of forest managers or workers. He also showed several examples of how Inverde is conducting its training and what kind of training approaches have been effective.

Wrap-up session

Finalization of the new work plan

Publication on genetic aspects of forest management: The working group (J. Hubert, B. Van der Aa, M. H. Almeida, J. Koskela, R. Knol, P. Rotach, T. Eysteinnsson, A. Valadon and A. Steffenrem) presented the new layout for this publication (chapters: introduction, natural regeneration, artificial regeneration and summary). It was agreed that the working group will develop a first draft by 31 January 2009 and it will be then circulated to the Network members for their comments with a deadline of 28 February 2009. Based on the comments, the working group will finalize the text by 30 April 2009.

Chapter on relevant policies and practices related to gene conservation and forest management: It was agreed that J. Koskela and J. Hubert should provide their comments for the summary report developed by the working group (T. Eysteinnsson, M. Dopazo Gonzales, M. Peltonen and N. Foley). The working group should then develop a second draft by 28 February 2009. It will be circulated to the Network members and they should provide their comments by 30 March 2009. The working group should then finalize the text by 31 May 2009. The report will be published as a chapter in the cross-Network publication on forest management and FGR.

Chapter on policy tools to promote the use of high quality FRM (with examples on inappropriate use of FRM): The working group (B. Ditlevsen, A. Valadon, T. Eysteinnsson, N. Foley, C. Jasser and M. H. Almeida) will develop a draft by incorporating the examples on inappropriate use of FRM into the draft summary developed by B. Ditlevsen. The draft should be ready for circulation by 28 February 2009 and the Network members should provide their comments by 30 March 2009. The working group will then finalize the text by 31 May 2009. The text will be also published as a chapter in the cross-Network publication on forest management and FGR.

Overview of climate change strategies in different countries: The working group (J. Hubert, A. Valadon, B. Ditlevsen and M. Peltonen) will review the existing climate change strategies in different countries and summarize their recommendations for the use of forest genetic resources. The draft text should be developed by 30 March 2009 and it will be then circulated to the Network members for their comments (deadline by 30 April 2009). The working group will then finalize the text by 30 June 2009 and it could be published as a four-page leaflet.

Date and place of next meeting

It was proposed that the next meeting should be held in early November 2009. M. H. Almeida offered to host the next meeting in Portugal and, as a second option, J. Hubert also expressed his interest to host the meeting in the UK. It was agreed that the Secretariat should assess these offers in consultation with M. H. Almeida, J. Hubert (Chair) and B. Ditlevsen (Vice-Chair) and inform the Network members accordingly regarding the date and place of the next meeting.

With no other business, J. Hubert closed the meeting and thanked the local organizers for their efforts and the participants for their inputs during the meeting.

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