THE SECOND REPORT ON THE STATE OF THE WORLD'S FOREST GENETIC RESOURCES

SUBMISSION BY

EUFORGEN

This report was prepared as a contribution to the FAO publication, *The Second Report on the State of the World's Forest Genetic Resources*.

Regional networks and international organizations were invited to submit written reports structured around the four strategic priorities of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources (FGR)– (1) improving the availability of, and access to, information on FGR; (2) conservation of FGR (*in situ* and *ex situ*); (3) sustainable use, development and management of FGR; and (4) policies, institutions and capacity building.

Contributions of the European Forest Genetic Resources Programme to the implementation of The Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources

2013-2020

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Introduction

The European Forest Genetic Resources Programme (EUFORGEN) is a collaborative programme between European countries for managing their collective Forest Genetic Resources (FGR). It was established in October 1994 as a pan-European implementation mechanism for Resolution S2 [1] (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.

In 2015, at the 7th Forest Europe Ministerial Conference, 46 European countries and the European Union committed to "continue pan-European collaboration on forest genetic resources through the European Forest Genetic Resources Programme (EUFORGEN)" [2]. This is a recognition of EUFORGEN's effectiveness and its distinctive and valuable role in *conserving forest genetic diversity and contributing to sustainable resource management*. Within the same Ministerial Resolution, countries also committed to "promote national implementation of strategies and guidelines for dynamic conservation and appropriate use of forest genetic resources under changing climate conditions," referencing the strategies and guidelines developed by the countries through EUFORGEN over the previous decade.

Furthermore, in 2021 at the 8th Forest Europe Ministerial Conference, signatories will reiterated their commitment to EUFORGEN by recognizing "the need for dynamic conservation and utilization of forest tree genetic resources and management of forest tree species populations for production of forest reproductive material and continuing pan-European collaboration on forest genetic resources through the EUFORGEN" [3], which is a recognition of EUFORGEN's effectiveness and its distinctive and valuable role in *monitoring the conservation of forest genetic resources in Europe*.

EUFORGEN also contributes to the implementation of relevant decisions made by the Convention on Biological Diversity (CBD) [4] . It also contributes to implementing and monitoring regional-level strategic priorities of the Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources (GPA-FGR) [5], which was adopted by the FAO[1] Conference in 2013.

EUFORGEN is an important coordinating tool for European countries to optimise national-level FGR conservation and to scale up conservation needs from a national perspective to one embracing the whole species´ distribution range.

The overall goal of EUFORGEN is to promote the conservation and appropriate use of FGR as an integral part of sustainable forest management. The Programme brings together experts from its member countries to exchange information and experiences, to analyse relevant policies and practices, and to develop tools and methods for better management of FGR.

Over the past 25 years, EUFORGEN has evolved globally into a reference platform for collaboration, information exchange and a science-policy-practice dialogue. Based on the collective knowledge of

[1] Food and Agriculture Organization of the United Nations

these national experts and through established synergies, EUFORGEN has produced a large number of important outputs, such as the pan-European genetic resources conservation strategy, technical guidelines, distribution maps of European forest tree species, information systems, and other technical and expert publications and reports. The Programme has contributed to assessment reports on European forests' status and enabled member countries to develop and implement FGR-related European projects.

EUFORGEN plays a key role in the European FGR community, by linking ongoing research projects with the broader FGR community, while at the same time maintaining active communication channels with all European countries.

EUFORGEN acts as an impartial source of expertise, and provides a platform for informed discussion and scientific consensus building. In bringing together people from countries with different levels of expertise and experience, it helps to develop capacity among all member countries and beyond. Furthermore, it provides a venue for enhancing mutual understanding on FGR conservation and sustainable use.

EUFORGEN is financed by its Member Countries and its 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.

EUFORGEN carries out its activities through working groups and workshops. The working groups are established by the Steering Committee (SC) to address specific issues During the reported period the following working groups have operated:

- Working group on revising the indicator on genetic resources (4.6) part of the set of European criteria, and indicators for sustainable forest management [6]
- Working group on developing guidelines and a decision-support tool for better incorporating genetic aspects into production and use of forest reproductive material [7]
- Working group on developing a decision-support tool for the management of the genetic conservation units' network [8]
- Working group the implication of ash dieback on the European Network of Genetic Conservation Units.
- Working group on revising the pan-European FGR Strategy [9]

The reports of the first three working groups are available via the EUFORGEN's website www.euforgen.org.

The programme is funded by national governments who nominate the National Coordinators through respective ministries responsible for forests. This provides the Programme with a firm footing to achieve government-driven consensus.

During EUFORGEN Phase V (2015-2019) a total of 27 countries have been supporting the Programme: Austria, Belgium, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Lithuania, Luxemburg, The Netherlands, Norway, Poland, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

In January 2020 EUFORGEN started its sixth Phase (2020-2024). As of September 2021, 26 countries are financially supporting the programme, which are those listed above, excluding Greece and Turkey, but additionally including Malta.

EUFORGEN's ***Mission*** is to serve as a platform for pan-European collaboration in FGR, where member countries contribute to the Programme´s activities and outputs, formulate joint recommendations and promote national implementation of strategies and guidelines for dynamic conservation and appropriate use of FGR under changing climate conditions. This *Mission* is based on the experience and lessons from 25 years of pan-European collaboration in FGR management, the result of a broad review [10] undertaken in 2016 and the prioritisation of the Steering Committee.

The **objectives** of EUFORGEN have evolved through the Phases. Initially, the Programme focused on building capacity across countries and creating a community of professionals working on FGR in Europe. Then the Programme evolved to exchange information and set priorities. Once EUFORGEN had collectively reached a broad understanding of relevant issues related to FGR, it began developing conservation **strategies**, defining conservation **priorities** and identifying **research and policy needs**.

During the current Phase VI (2020-2024), EUFORGEN is working towards three **strategic objectives**, along with the related **operational objectives** presented below. These strategic and operational objectives have been defined by the EUFORGEN Steering Committee and arise from consultations with the main stakeholders and the recommendations of the external evaluation.

The three strategic objectives and the related operational objectives for EUFORGEN Phase VI are:

1. **Facilitate knowledge sharing and communications with key stakeholders**
    - Facilitate knowledge sharing and learning among relevant actors (e.g. scientists, national competent authorities, practitioners and policymakers)
    - Communicate the importance of genetic diversity and outputs of EUFORGEN to policymakers, forestry professionals and practitioners on the ground, wider scientific community and society
    - Maintain and further develop the European Information System on Forest Genetic Resources (EUFGIS)[2] and contribute to the further development of the distribution maps of European forest trees
    - Contribute to relevant international reporting efforts, such as the State of Europe's Forests reports
2. **Coordinate the implementation of the conservation of forest genetic resources in Europe.**
    - Update and promote the pan-European conservation strategy, including responses to large-scale risks
    - Implement the conservation strategy
    - Contribute to the implementation of regional-level priorities of FAO Global Plan of Action for the Conservation, Sustainable Use and Development of Forest Genetic Resources.
3. **Promote the appropriate use of forest genetic resources.**
    - Prepare science-based recommendations and tools for better incorporating genetic aspects into Sustainable Forest Management practices

[2] http://portal.eufgis.org

- Analyse policy issues and recommend changes when they conflict with the appropriate use of FGR.

Priority Area 1: Improving the availability of, and access to, information on forest genetic resources

EUFORGEN has developed, and continues to maintain the European Information System on Forest Genetic Resources (EUFGIS), a unique system which supports countries in identifying gaps in conservation of forest tree species and in setting priorities to fill these conservation gaps. The system is a reference for all member countries and can be used as a national information system.

Since 2010, EUFGIS data has been used to assess dynamic *in situ* and *ex situ* genetic conservation activities in Europe and is used by 35 European countries and by EUFORGEN as a source of data for reporting purposes.

EUFGIS is the only transnational information system on FGR in Europe. It currently contains information on more than 3,500 Genetic Conservation Units (GCUs) of 111 tree species from 35 European countries. Currently, data in EUFGIS has only limited climatic and environmental parameters associated with each GCU.

EUFGIS is managed by the EUFORGEN Secretariat, and data is curated and maintained by National Focal Points[3] in European countries with regular updates.

In 2015, the EUFORGEN programme released a new website that provides access to information on FGR conservation in all European countries[4] also providing access to the same information by species[5].

Priority area 2: Conservation of forest genetic resources (*in situ* and *ex situ*);

Since their release in 2010, European countries have started to follow the "pan-European minimum requirements for dynamic genetic conservation units of forest trees"[6] to assess FGR conservation status. These minimum requirements are based on the concept of dynamic conservation of genetic diversity, which emphasises the maintenance of evolutionary processes within tree populations to safeguard their potential for continuous adaptation.

In 2015 EUFORGEN release the "Pan-European strategy for genetic conservation of forest trees and establishment of a core network of dynamic conservation units"[9], presenting an innovative approach to defining targets for dynamic conservation of FGR in Europe.

This report was followed by "Approaches to the Conservation of Forest Genetic Resources in Europe in the Context of Climate Change"[11], presenting the state of knowledge on the implications of climate change for conserving forest genetic resources and providing recommendations for further action. In particular this report conceptualized the need for developing a potential decision cascade for gene conservation under climate change. During 2015-2019, a working group further expanded the conceptualization and prepared the "Decision-support tool for the management of dynamic genetic conservation units"[12]

A major achievement of EUFORGEN during the reporting period was the release of the "Dynamic conservation and utilization of forest-tree genetic resources: indicators for *in situ* and *ex situ* genetic conservation and forest reproductive material." [13] The indicator 4.6 is a quantitative indicator which contributes to Criterion 4 (Maintenance, conservation and appropriate enhancement of biological

[3] http://portal.eufgis.org/data-providers
[4] www.euforgen.org/member-countries
[5] www.euforgen.org/species
[6] http://portal.eufgis.org/fileadmin/templates/eufgis.org/documents/EUFGIS_Minimum_requirements.pdf

diversity in forest ecosystems) part of the set of European criteria, and indicators for sustainable forest management[7] adopted by the Forest Europe process. This report offers a way to measure the conservation and use of the genetic diversity of forest trees across Europe in a standardized way. This indicator is based on an agreed revision of a commonly adopted framework allowing to measure this diversity and monitor its conservation and utilization over time.

During the period March 2016 to February 2020 EUFORGEN contributed to the project GenTree ("Optimising the management and sustainable use of forest genetic resources in Europe"), a project funded by the EU Horizon 2020 research and innovation programme. The goal of GenTree was to provide the European forestry sector with better knowledge, methods and tools for optimising the management and sustainable use of FGR in Europe in the context of climate change. The project was coordinated by the Institut National de la Recherche Agronomique (INRA), France and included 22 public and private research organizations and enterprises in the consortium. The EUFORGEN Secretariat was co-responsible for the work package on communication and stakeholders' engagement. It also contributed to other tasks, such as the improved characterisation of the EUFGIS Network of genetic conservation units and the definition of priority areas for establishing new genetic conservation units in Europe. More information on GenTree is available at https://www.gentree-h2020.eu

During 2011-2014 a EUFORGEN Working Group developed the "genetic monitoring methods for genetic conservation units of forest trees in Europe"[14], which set a new reference for the long-term monitoring of genetic diversity in conservation areas.

Since 2019 EUFORGEN has continued to contribute to the Horizon 2020 GenRes Bridge project[8] (Jan 2019-Dec 2021), a project that aims to strengthen conservation and sustainable use of genetic resources in Europe. The project will accelerate collaborative efforts and widen capacities in plant, forest and animal GenRes domains by sharing perspectives, exchanging best practices, harmonizing standards, trainings and sharing resources under the auspices of the three pan-European GenRes networks: ECPGR, EUFORGEN and ERFP. The major product of the project will be the European genetic Resources Strategy, to be released by the end of 2021.

Priority area 3: Sustainable use, development and management of forest genetic resources

During Phase V of the Programme a working group was active in collecting scientific evidence to support the development of guidelines and decision support tools. The result of the review is presented in the report "Genetic aspects linked to production and use of forest reproductive material" [15].

The report summarises the current state of knowledge on genetic aspects linked to the production and use of forest reproductive material (FRM). The report is the result of an international collaboration rooted in EUFORGEN for more than two decades. It is built on the firm belief that the genetic element is critical to the creation of any resilient forest capable of surviving threats and adapting to changes, thus enabling the evolution of ecosystems and the conservation of the productive landscape.

This report built on previous activities of the programme, in particular the report " Use and transfer of forest reproductive material in Europe in the context of climate change." [16], a report that presented possible approaches to using and transferring FRM under climate change and identified critical factors.

[7] https://foresteurope.org/sfm-criteria-indicators/
[8] http://www.genresbridge.eu

Priority area 4: Policies, institutions and capacity-building

During 2010-2014, a working group analysed the implications of global, European and national policies for the conservation and use of forest genetic resources in Europe and published a report [17] that presented key findings and recommendations.

During the reporting period, the EUFORGEN programme, supported by the GenTree project, organized two training workshops for the EUFGIS focal points.

In 2019, the EUFORGEN Programme initiated the development of the European Forest Genetic Resources Strategy, a coordinated effort for the conservation and sustainable use of the European forest genetic resources. The Strategy identifies FGR conservation research needs, defines linked principles for coordinating activities at policy level, and formulates recommendations for future actions and collaboration among different entities and international organizations.

Concluding remarks

EUFORGEN provides a unique platform for exchanging knowledge and information. It promotes a science-policy-practice dialogue, contributing to the development of conservation strategies and the identification of priorities and responses to policy gaps. The Programme represents a comprehensive level of collective knowledge far beyond that of any single country. Moreover, as EUFORGEN is funded by national governments, with National Coordinators nominated by each country's respective forest ministry, the Programme is informed by a firm, government-driven consensus.

Since conservation of FGR requires material to remain *in situ*, all countries across the distribution range of each species need to participate and collaborate. For an effective conservation of FGR diversity neighbourhood countries should develop similar conservation strategies. To support such initiatives, EUFORGEN is exploring possibilities for knowledge transfer and collaboration among neighbourhood countries.

As a networking programme, EUFORGEN has already played a key role in developing a joint conservation strategy for European countries, as well as helping in its implementation and monitoring progress, and gap identification. The programme is working on improving the pan-European conservation strategy, its dissemination and presentation to policy makers to seek funding for its implementation.

Annex 1 Cited Publications

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Annex 2 Relevant Information system

The European Information System on Forest Genetic Resources

http://portal.eufgis.org

The European Information System on Forest Genetic Resources (EUFGIS) is the only transnational information system on forest genetic resources (FGR) in Europe. It currently contains information on more than 3500 Genetic Conservation Units (GCUs) of 111 tree species from 35 European countries.

EUFGIS is maintained by National Focal Points in European countries with regular updates. Since its establishment in 2010, European countries have started to follow the “pan-European minimum requirements for dynamic genetic conservation units of forest trees” set out in EUFGIS. These minimum requirements are based on the concept of dynamic conservation of genetic diversity, which emphasises the maintenance of evolutionary processes within tree populations to safeguard their potential for continuous adaptation. All the GCU characterisation data will be made available long-term through the information system.