

Preface

The loss of forest biodiversity stems largely from direct and indirect human activities including deforestation, fragmentation, the degradation of forest habitat and the introduction of invasive species. The current focus is on halting this loss of forest biodiversity and on methods for monitoring the maintenance of forest ecosystems at the international level.

Information required for sustainable forest management as a whole, as well as for forest biodiversity at national and international levels, must be based on robust, statistically sound, updated and long term information systems. National Forest Inventories (NFIs) all contribute to this effort. In many countries inventories have been carried out at national levels and are now increasingly major participants in international reporting mechanisms. Due to different historical backgrounds and varying environmental conditions NFI's use different basic definitions and methods which lead to inconsistencies and lack of comparability for international reporting.

To harmonize global forest information the Food and Agricultural Organization of the United Nations (FAO) has been developing common key definitions. Nevertheless, for practical application for international reporting purposes, these definitions have not been consistently applied. Therefore, the European NFIs decided to collaborate on harmonization of forest information and established the European National Forest Inventory Network (ENFIN).

In addition to its overall mission to provide harmonized forest inventory information on European forests, ENFIN promotes knowledge-sharing, enhanced sampling and assessment methods, and new ideas, thereby maintaining and improving updated forest information systems. It ensures continuous improvement of methods, data collection and data analysis within the NFIs.

Many research projects have developed efficient, optimized methods for monitoring forest biodiversity at a variety of spatial and temporal scales. Nevertheless, a straight forward approach for monitoring forest biodiversity is still lacking. Working Group 3 of COST Action E43 demonstrated that NFI data can be used to achieve comparable and meaningful biodiversity assessments for a large range of selected variables.

This book provides a comprehensive and informative overview of forest biodiversity. In addition, it provides in-depth descriptions and analyses of the essential features of forest biodiversity indicators, the need for harmonized estimates and NFI applications based on practical tests with raw data. Recommendations on the feasibility of forest biodiversity indicators offer a valuable basis for future adoptions of both NFI assessment catalogues and international reporting requirements. I congratulate the editors and authors of this outstanding work on future global monitoring of forest biodiversity.

Vienna
June 2010

Klemens Schadauer
ENFIN Chair

Preface – COST Action E43

The demands for global-level forest information have increased during the past decades due to international agreements and associated reporting requirements. Information reported from different countries should be comparable and on sound statistical bases to be applicable for decision-making.

National Forest Inventories (NFI) have produced forest-related information in some countries for more than 100 years. European NFI teams met in Vienna in 2003 to discuss the new challenges and the measures necessary to promote full use of existing NFIs by data users. As a result, the European National Forest Inventory Network (ENFIN), a network of NFIs, was established. ENFIN members applied for funding to support collaborative efforts to make inventory data and estimates from different countries comparable and inventory results more applicable for users. COST – European Cooperation in Science and Technology – provided the financial means to cover the additional costs needed.

A total of 27 European countries joined COST Action E43, *Harmonisation of National Forest Inventories in Europe: Techniques for Common Reporting*. In addition, the Forest Inventory and Analysis (FIA) programme of the U.S. Forest Service, Scion from New Zealand and the European Joint Research Centre, Institute for Environment and Sustainability, joined COST Action E43 as institutions from non-COST countries. Further, NFI representatives from several other countries participated in the meetings and work of COST Action E43.

COST Action E43 worked closely with international organizations and institutions such as the United Nations Food and Agricultural Organization, the European Commission and the European Environment Agency.

COST Action E43 adopted a mission to develop methods, concepts and definitions for use in harmonizing NFIs so that information from different countries would become fully comparable. The work was organized into three Working Groups: Working Group 1 focused on basic forest inventory concepts and definitions; Working Group 2 focused on forest inventory issues related to greenhouse gas reporting for UNFCCC; and Working Group 3 focused on biodiversity indicators that could be estimated from NFI observations. The work was carried out in meetings, workshops and scientific missions. The official duration of COST Action E43 was from June 2004 to December 2008, but the publishing work continued into 2011.

Members of COST Action E43 collected a large amount of information from the NFIs of the participating countries using questionnaires directed to a wide group of NFI data producers. The information concerned all the main areas of the three Working Groups. Scientific outcomes have been published in multiple journals with a collection of articles published in a special issue of *Forest Science*. The operational practices of a large number of NFIs were reported as NFI reports in a book published by Springer in 2010¹. Reports from Brazil, Canada, China, Japan, Luxembourg, Poland, the Republic of Korea and the Russian Federation, in addition to reports for the 29 participating countries and institutions were included.

The three Working Groups worked closely together, particularly in developing common concepts, definitions and methods. However, the work of Working Group 3 was somewhat different from that of Working Groups 1 and 2. Initially, forest biodiversity concepts as they related to forest inventory variables had not been elaborated as much as the basic forest inventory concepts and concepts related to greenhouse gas reporting. One reason is the multidimensionality of biodiversity itself which ranges from genetic diversity to landscape diversity. Working Group 3 focused its efforts at plot-level and landscape diversity by first identifying the most important NFI variables related to forest biodiversity and then deriving seven essential biodiversity features from variables that are relevant for assessing the status of biodiversity. Working Group 3 further assessed the harmonization status of those variables and features among the participating countries, as well as future prospects for harmonized assessments of forest biodiversity using information for variables collected in NFIs. Further, the Working Group demonstrated how harmonized forest biodiversity estimates can be obtained when data from different countries have been collected using different definitions of the basic variables.

This volume is a comprehensive documentation of the work of Working Group 3 of COST Action E43, as well as general information related to forest biodiversity, its assessment and reporting. The participation of forest inventory experts, directly involved in practical work, stimulated the work and promoted successful outcomes. As a chair of the Management Committee of COST Action E43, it is my privilege and pleasure and to thank the editors and authors of this book, as well as the members of Working Group 3 of Cost Action E43, for the outstanding work.

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¹Tomppo E, Gschwantner T, Lawrence M, McRoberts RE (eds) (2010) *National forest inventories: pathways for common reporting*. Springer. 612 p. ISBN 978-90-481-3232-4.

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