

EFORWOOD
Tools for Sustainability Impact Assessment

**Database gathering the statistics for both biotic and abiotic hazards
intensity and occurrence in reference forest types hazards**

Hervé Jactel



EFI Technical Report 65, 2011

Database gathering the statistics for both biotic and abiotic hazards intensity and occurrence in reference forest types hazards

Hervé Jactel

Publisher: European Forest Institute
Torikatu 34, FI-80100 Joensuu, Finland
Email: publications@efi.int
<http://www.efi.int>

Editor-in-Chief: Risto Päivinen

Disclaimer: The views expressed are those of the author(s) and do not necessarily represent those of the European Forest Institute or the European Commission. This report is a deliverable from the EU FP6 Integrated Project EFORWOOD – Tools for Sustainability Impact Assessment of the Forestry-Wood Chain.

Preface

This report is a deliverable from the EU FP6 Integrated Project EFORWOOD – Tools for Sustainability Impact Assessment of the Forestry-Wood Chain. The main objective of EFORWOOD was to develop a tool for Sustainability Impact Assessment (SIA) of Forestry-Wood Chains (FWC) at various scales of geographic area and time perspective. A FWC is determined by economic, ecological, technical, political and social factors, and consists of a number of interconnected processes, from forest regeneration to the end-of-life scenarios of wood-based products. EFORWOOD produced, as an output, a tool, which allows for analysis of sustainability impacts of existing and future FWCs.

The European Forest Institute (EFI) kindly offered the EFORWOOD project consortium to publish relevant deliverables from the project in EFI Technical Reports. The reports published here are project deliverables/results produced over time during the fifty-two months (2005–2010) project period. The reports have not always been subject to a thorough review process and many of them are in the process of, or will be reworked into journal articles, etc. for publication elsewhere. Some of them are just published as a “front-page”, the reason being that they might contain restricted information. In case you are interested in one of these reports you may contact the corresponding organisation highlighted on the cover page.

Uppsala in November 2010

Kaj Rosén

EFORWOOD coordinator

The Forestry Research Institute of Sweden (Skogforsk)

Uppsala Science Park

SE-751 83 Uppsala

E-mail: firstname.lastname@skogforsk.se



EFORWOOD

Sustainability Impact Assessment
of the Forestry - Wood Chain



Project no. 518128

EFORWOOD

Tools for Sustainability Impact Assessment

Instrument: IP

Thematic Priority: 6.3 Global Change and Ecosystems

Deliverable PD2.4.1

**Database gathering the statistics for both biotic and abiotic hazards
intensity and occurrence in reference forest types**

Due date of deliverable: Month 12

Actual submission date: Month 17

Start date of project: 01/11/05

Duration: 4 years

Organisation name of lead contractor for this project deliverable: INRA

Final version

| Project co-funded by the European Commission within the Sixth Framework Programme (2002-2006) | | |
|--|---|---|
| Dissemination Level | | |
| PU | Public | X |
| PP | Restricted to other programme participants (including the Commission Services) | |
| RE | Restricted to a group specified by the consortium (including the Commission Services) | |
| CO | Confidential, only for members of the consortium (including the Commission Services) | |

PD 2.4.1 Database gathering the statistics for both biotic and abiotic hazards intensity and occurrence in reference forest types

HERVE JACTEL

INRA

69 Route d'Arcachon

33612 Cestas, France

Abstract:

A database on statistics about the prevalence of the 7 main biotic and abiotic hazards in European forests is being built. It is focused on the 8 tree species that provide the main part of European forest wood resources. It relies on raw data delivered by the ICP Forests monitoring programme which is based on around 6 000 Level I plots distributed across all EU countries. In each plot around 20 trees have been sampled to qualify crow condition since 1985. Twenty one European countries, out the 34 from the ICP consortium, have accepted to pass on their data to the EFORWOOD project. The database contains information at the plot level (location, site conditions, tree composition) and at the tree level (tree species, branch mortality, defoliation, discoloration, damaging agents) for each year of the monitoring. The database will be managed under Access and excel softwares.

CONTENT

| | | |
|----------|--|----------|
| 1 | INTRODUCTION | 3 |
| 2 | DATABASE ON HAZARD STATISTICS IN EUROPEAN FORESTS | 3 |
| 3 | PERSPECTIVES..... | 4 |
| 4 | REFERENCES | 5 |

1 Introduction

The WP 2.4 is currently building up two databases to meet the objectives of the Module 2 in EFORWOOD. In accordance with our work plan the first database will gather statistics about the prevalence of biotic and abiotic hazards in European forests. The main goal of this compilation is to rank the risk of damage on the main productive tree species in Europe. This classification will reveal the more damaging agents and the most sensitive tree species. It will in turn indicate which ‘hazard – tree species’ interaction we should focus on in the second step of our analysis, where we will investigate the effect of forest management on stand susceptibility. For this purpose we are setting up a second database with the relevant scientific literature about the effect of silvicultural practices on tree susceptibility to biotic and biotic hazards. Both databases will be further used to develop risk rating modules in the growth model platform managed by the WP 2.5 and to document indicators in TOSIA.

2 Database on hazard statistics in European forests

A Database on Forest Disturbances in Europe (DFDE) has been already launched (available from the EFI website) but it is made of a list of papers from the scientific and grey literature. It may be then biased with an over representation of large or spectacular damaging events like hurricanes, declines, large outbreaks or severe droughts. Because it is not based on raw data collected along a sampling strategy, this database is probably not suitable to develop the statistical analyses planned in our Work Package.

We have therefore decided to target ICP Forest data. The ICP Forests monitoring programme was established in 1985. It is based on around 6 000 Level I plots distributed across all EU countries. In each plot around 20 trees are sampled to qualify crown condition. We are particularly interested in datasets where agents having caused changes in crown condition have been documented, using the ICP standard codification:

- 100-Game and grazing
- 200-Insects
- 300-Fungi
- 400-Abiotic agents
- 500-Action of men
- 600-Fire
- 700-Atmospheric pollutants
- 800-other factor

The relative frequency of the main causes of damage will be compared between the 8 tree species which provide the main part of European forest wood resources and have been selected by the Module 2 as target species:

1. Beech
2. Eucalypt
3. Oak(s)
4. Birch
5. Norway spruce
6. Sitka spruce
7. Scots pine
8. Maritime pine.

For that purpose we have sent an official request to the ICP board. They have circulated it among the 34 European countries involved in the monitoring program, asking for their agreement to pass on their data to the EFORWOOD project. We got so far a positive answer from 21 countries:

- Austria
- Belgium
- Bulgaria
- Croatia
- Cyprus
- Czech Republic
- Denmark
- Estonia
- France
- Hungary
- Italy
- Latvia
- Lithuania
- Luxembourg
- Netherlands
- Norway
- Poland
- Portugal
- Serbia
- Spain
- United Kingdom

The data will be sent to us by ICP on week 41 (mid-October 2006).

The database will be managed under ACCESS and EXCEL. It will comprise 2 main tables

Table 1: Plot data:

- Geographical information: latitude, longitude, name of the locality, district, region ...
- Site information: soil type, altitude, exposition, class of tree age.
- Temporal information: starting and finishing date (year) of the monitoring
- Forest information: main three tree species in the plot with their class of dominance

Table 2: Tree data

There will be one line per tree and year in the file

- General information: year, plot number, tree number, tree species
- Damage information: branch mortality, % of crown defoliation and class of defoliation, class of crown discoloration, identification of the main cause of damage (cf. supra)

3 Perspectives

To complete this database we plan to organise two additional specific databases on wind and fire damage in European Forests. The reason is that we anticipate the ICP data to be irrelevant to evaluate the prevalence of these abiotic damages. ICP data give tree level information whereas fire and wind damage are more often expressed in damaged areas or affected timber volumes.

4 References

Database on Forest Disturbances in Europe. *In* EFI web site. [on line]. <http://www.efi.fi/projects/dfde/> (24 October, 2006)

ICP. Executive report 2006. *In* ICP web site. [on line]. <http://www.icp-forests.org/RepEx.htm> (24 October, 2006)