

COST Action E43 on *Harmonisation of National Forest Inventories in Europe: Techniques for Common Reporting*

Minutes of the 1st Working Group 1 meeting, 9 – 10 September 2004, Hørsholm, Denmark

Recorder: Adrian Lanz, adrian.lanz@wsl.ch

18th October 2004

Contents

I. 1st session, 9 September 2004, 13:00-17:00	2
1. Participants	2
2. Workflow	5
3. Initial NFI overview	5
3.1. Remote Sensing	5
3.2. Terrestrial inventory	6
3.3. Error estimation	6
4. Questionnaire	7
4.1. Objects and attributes	7
4.2. Forest definition	7
4.3. Forest classification	7
4.4. Tree measurements	8
4.5. Standing tree volume	8
5. Status quo	8
5.1. Issues to be clarified	8
5.2. Reminders	9
5.3. Varia	9
II. 2nd session, 10 September 2004, 11:00-12:00	9
6. NFI description	9
6.1. Generalities	9
6.2. Contents of the report	9
6.3. Timetable	10

III. 3rd session, 10 September 2004, 13:00-14:30	10
7. Harmonising with WG2	10
7.1. Land-use and land-cover classification	10
7.2. Managed Forests	10
8. Harmonising with WG3	10
8.1. Forest edges and boundaries	11
9. Work plan of WG1	11
10. Outlook and remarks	11

Part I.

1st session, 9 September 2004, 13:00-17:00

1. Participants

It has been agreed that all participants provide some information for the minutes describing their professional background. Here the contributions in no particular order. Please note that in the electronic version of this PDF file most person and institute names are linked with email and web addresses (just click on them to open your web browser or email client).

- Claude VIDAL (France): Director of the French NFI. Leader of WG1. The French NFI is an independent body responsible for collecting, compiling and disseminating data from the inventory. I was previously working at Eurostat (European Commission) as adviser to the *Director of Agriculture, Environment and Regional Statistics* dealing with agri-environmental indicators, landscape and sustainable agriculture.
- Adrian LANZ (Switzerland): Swiss Federal Institute for Forest, Snow and Landscape Research WSL. Responsible for inventory design and statistics in the Swiss NFI. Deputy leader of WG1. PhD in forestry and MSc. in statistics.
- Veiko ADERMANN (Estonia): Centre of Forest Protection and Silviculture (under Ministry of the Environment), Department of National Forest Inventory, Head of Department. Main expertise: inventory design, methods of field measurements, data processing, reporting of results.
- Richard BÜCHSENMACHER (Austria): Austrian Federal Office and Research Centre for Forests (BFW), Department of Forest Inventory (Deputy), Unit of Inventory Design, Evaluation and Remote Sensing (Head of Unit), responsible for evaluation and interpretation of the NFI, data preparation for different reports (national and international).
- Wolfgang RUSS (Austria): Austrian Federal Office and Research Centre for Forests, Vienna. Department: Austrian Forest Inventory. Unit: Logistic and Databases - Head of unit. Responsible for: Planning, preparation and logistic of assessment in the field, administration of databases (Tablet-PC and main server), statistics about forest area

- Karl GABLER (Austria): Austrian Federal Office and Research Centre for Forests (BFW), Vienna. Department of Forest Inventory. Unit of Evaluation, inventory design and remote sensing. Responsible for methods of evaluation, sampling design.
- Patrizia GASPARINI (Italy): Istituto Sperimentale per l'Assestamento Forestale e per l'Alpicoltura, Forest and Range Management Research Institute (ISAFI), Trento (Italy). Role of ISAFI in the NFI: responsible for the scientific and technical aspects of Italian NFI (definition of inventory design, planning of survey phases, training of field teams, data quality control, data computing and result presentation). Personal contribution: definition of classification and photo interpretation procedures (1st phase of NFI), definition of field measurements procedures (2nd phase), training of field teams, data quality control, dissemination of main concepts of the 2nd NFI Project through WEB site pages. Personal expertise: ground measurement procedures, information requirements, classification procedures, photo interpretation.
- Justin GILBERT (UK): Inventory Officer, Woodland Surveys Unit Forest Research, Forestry Commission. Main roles: survey design and documentation, data collection, data management and analysis, reporting and presentation of results. Advice to users of data requiring non-standard analysis. Also responsible for timber forecasting for the private sector in GB (based on NFI data). History: B.Sc.(Forestry) 1979, survey work for Forestry Commission from 1980, fieldwork for 1980 Census of Woodland and analysis / report production to 1986, work on National Inventory of Woodland from 1993 to date, now involved in work for the next cycle of the NFI, design, data management etc.
- Milan HOČEVAR (Slovenia): Slovenian Forestry Institute. Head of Forest Inventory and Geomatics Department, research in field of Forest Inventory, Remote Sensing and GIS and professor at University of Ljubljana, Department of Forestry; Courses in Forest Inventory and Remote sensing.
- Kari T. KORHONEN (Finland): Finnish Forest Research Institute (METLA), Joensuu Research Centre. I work as a project leader in the 10th NFI of Finland. My main expertise is in field data collection, statistical modelling, data processing and reporting. I also have research projects on going related to management planning inventories.
- Tarja TUOMAINEN (Finland): Finnish Forest Research Institute (METLA), Vantaa Research Centre, Helsinki Unit. I work as a researcher in the National Forest Inventory. My main expertise is (a) planning of field measurements and training field workers of NFI (b) produce and report NFI results (c) calculate forest resources results for national and international statistics. I also take part to the COST Action E27 Protected forest areas in Europe.
- Heino POLLEY (GERMANY): Federal Research Centre for Forestry and Forest Products Hamburg (BFH). Scientific leader of the German NFI. Responsible for development of inventory design and methods, coordination of all inventory work, compilation and evaluation of the data and reporting of results.
- Bruno Bilde JØRGENSEN (Denmark): Centre for Forest, Landscape and Planning (KVL). Senior consultant in the Danish NFI, main responsibilities in the NFI: Planning of field measurements and training field workers of NFI, instruments and contact to forest owners. Areas of expertise: forest measurements, long term field experiments, selection of forest seed trees, forest health, silviculture.
- Jesús SAN-MIGUEL-AYANZ (EC-JRC): European Commission - DG Joint Research Centre

- Ulf SÖDERBERG (Sweden): Swedish University of Agricultural Sciences (SLU). I have been working with the Swedish NFI since 1988. I have also worked with the development of the NFI in British Columbia, Lithuania and Denmark. My main expertise is in forest inventory, growth and yield, forest monitoring and biodiversity.
- Ovidiu BADEA (Romania): Forest Research and Management Institute (ICAS), Bucharest, Romania. Head of Biometrics and Forest inventory labs. Specialist in dendrometrics, management planning, forest growth and forest monitoring.
- Ieva LICITE (Latvia): Ministry of Agriculture of Latvia, Forest Resources department. Ministry is responsible for NFI process in Latvia and takes supervision along it. I am working in Forest Information Division and I am responsible for NFI questionnaire preparation as well as for NFI coordination in whole.
- Jurgis JANSONS (Latvia): Mgr. silv., head of forest resources monitoring project, Latvian State Forestry Research Institute (Silava). LFRI Silava insures the NFI in Latvia. It is contracted by Ministry of Agriculture from the 03.2004. My responsibility is to organise the inventory process, administration of the project's budget, general guidance of field teams and data processing, preparation of analysis and reviews of NFI results, submitting them to Ministry of Agriculture. The background of our project is the instruction of field methods and calculations, provided by Ministry of Agriculture. Our job is also the calibration and optimisation of methods. My responsibility is also the control of field data quality.
- Niall FARRELLY (Ireland): Department of Agriculture and Food, Forest Service, Johnstown Castle estate, Co. Wexford. Responsible for the implementation of all technical aspects of the NFI in Ireland. These include inventory design, GIS analysis, database management, field procedures, photo interpretation, data analysis and reporting of results. Our first statistically based NFI will commence this autumn and finish early 2006.
- Martin MORAVCIK (Slovakia): Forest Research Institute, Zvolen; Head of Department of Forestry Policy, Economics and Forest Management Planning. Issues of finding out, monitoring and valuation of state and development of forests are into my agency. I have been dealing with these issues during my all practice in special (Forest Management Planning Institute - Lesoprojekt Zvolen) and research (FRI Zvolen) institutions. At present I am involved in Project of National Forest Inventory of Slovak Republic (2004-2006) in collective of Prof. Šmelko who is responsible for its preparation and realisation.
- Bjarki Þór KJARTANSSON (Iceland): Icelandic Forest Research. I am responsible for the GIS part of the Icelandic NFI. We have recently started planning our NFI in Iceland. It will be the first overall forest inventory in Iceland.
- Stein TOMTER (Norway): Norwegian Institute of Land Inventory (NIJOS), an institute under the Ministry of Agriculture. Head of NFI unit. Main expertise: Data processing, reporting of results, especially for international purposes.
- Martina HORČIČKOVÁ (Czech Republic): M.Sc. in Forestry. At the Forest Management Institute. Czech Republic. The Forest Management Institute is a governmental organisation established by the Ministry of Agriculture. One of its activities is forest. I am an expert in forest inventory and responsible for methods of field measurements and quality control. The Czech Republic's first cycle of national forest inventory: 2001-2004.

- László KOLOZS (Hungary): I work for the Hungarian State Forest Service at the headquarters. I am responsible for the Forest Management and Mapping Department. Besides the task mentioned above I have some experience on forest health and forest growth monitoring systems. During the last three years I was the Hungarian contact person and guided a trilateral Phare project aiming a new geographical information system.
- Jean WOLSACK (France): French NFI. Responsible for inventory design and operations. Specifically involved in sampling techniques, statistical assessment, information systems, modelling, database management and data processing.
- Graham BULL (Britain): Forestry Commission GB, Forest Research. Currently project leader and acting head of Woodland Surveys Unit of Biometrics Division who carry the NFI in GB. I worked in the 1980 Census of Woodlands - a sample survey carried out between 1979-81. The first NFI of Woodland and Trees completed in 2000 (see published reports <http://www.forestry.gov.uk/inventory>). Now working on the Protocol for the next NFI due to start in Spring 2005 - a 1ha sample plot survey based on a 1km x 1km grid.
- Martin CERNY (Czech Republic): Institute of Forest Ecosystem Research (IFER). Working on the field of forest inventory design, practices of computer-aided field data collection, and data processing methods; project leader of the preparation of the 1st and 2nd cycle of the Czech NFI, 1994-1999, 2004-2006; member of steering committee of the Czech NFI, Slovak NFI; technical support of NFI projects (CZE, IRE, ICE, SVK, UKR); project leading or participation in other forest inventory projects in CZE, tropical countries (UGA, MAL, ECU).
- Jean-Christoph HERVÉ (France): Head of the North-East district of the French NFI and Prof. of Forest Biometrics at the French Institute of Forestry, Agricultural and Environmental Engineering (ENGREF). Experience in statistical methods and models, growth modelling.
- Vivian Kvist JOHANNSEN (Denmark): Centre for Forest, Landscape and Planning (KVL). Leader of the Danish NFI and co-ordinator of Forest Inventory and Monitoring in Denmark together with Annemarie Bastrup-Birk. Main responsibilities in the NFI: inventory design and statistics, data management from forest to office, data analysis, evaluation and reporting. Areas of expertise: growth modelling, forest measurements, statistical methods, criteria and indicators.

2. Workflow

For this first session of the working group, it has been decided to adopt the following workflow:

- Short presentation of the members of the WG
- Initial overview over sampling techniques and estimation procedures in the NFIs represented in the WG
- Discussion of questionnaire's content

3. Initial NFI overview

3.1. Remote Sensing

Remote sensing techniques are used in most NFIs. The following uses of remote sensing techniques have been reported from WG members.

- Identification of terrestrial sampling plots
- Orientation in the field
- Forest mapping
- Stand type mapping
- Stratification in a combined two-phase sampling scheme with terrestrial and aerial samples
- No remote sensing
- Small area predictions
- Identification of productive forest areas
- Pre-Stratification of total forest area
- Replacement of field measurements

3.2. Terrestrial inventory

The following alternatives of terrestrial data collection have been mentioned.

- permanent and/or temporary plots
- sampling unit: stand or plot
- single sampling points or tracts
- varying sampling point densities
- stratification
- annual or periodic inventory
- relation or no relation with regional inventories
- region-by-region or inter-penetrating grids within a single inventory cycle
- random or systematic distribution of sampling points

3.3. Error estimation

Several topics have been collected which are related with the estimation procedures applied in NFIs.

- plots at stand boundary
- stratification within sampling plot (plot straddling over several forest types)
- auto-correlation in time and/or space
- size of reporting unit (minimal number of plots)
- integrating regional data in (error) estimation
- type of reporting unit: geographical units, forest types, administrative units
- problems with changing size and boundaries of reporting units
- volume functions

4. Working on questionnaire

4.1. Objects and attributes

A draft questionnaire has been distributed with the draft work plan for WG1. The participants agree in that a clear terminology with definitions is needed. The proposed terminology needs minor review. The concept of (different) objects with attached attributes seems to be a good starting point (see details in the draft work plan of WG1).

- clear and understandable terminology with definitions is needed for the questionnaire
- proposed terminology needs review

4.2. Forest definition

Comparing forest definitions and the attributes used to describe the object forest in different NFIs, the following point needs particular attention.

- Does NFI cover all forests?
- which technique are used to adjust national definitions to international definitions
- source of forest area definition (legal, national, NFI specific, ...)
- forest definition for terrestrial inventory
- forest definition on aerial photographs (mapping and/or point decision)
- forest type classification

4.3. Forest classification

Many different forest type classifications are used in the NFIs. This is a first overview of forest types and forest type classifications mentioned during the session. Several of the below issues are related to the forest definition in the NFIs.

- potential growth for young trees
- low trees (e.g. *pinus mugo*)
- protective forests
- excluded and included forest types
- parks, Christmas trees, ..
- damaged forest areas
- cadastral registration (legal definition)
- accessibility of sampling points
- young forest
- transition from agriculture to forest land
- land use vs. land cover
- road, river, forest buildings, hunting parks, ..

4.4. Tree measurements

Tree definitions and measurement techniques vary in the NFIs. The following issues seem particularly important to clarify in the questionnaire.

- exact tree definition is needed (species list, but also many other aspects used in NFIs)
- dead/living tree distinction
- use condition in the draft questionnaire should be regarded as an example for inclusion or exclusion of individual trees
- distinction between native and exotic trees
- definition, inclusion or exclusion of dead wood laying on ground
- detailed description of measurement technique needed (especially DBH, but also other measurements)
- marking of trees, plots and DBH

4.5. Standing tree volume

There are important differences in the NFIs with respect to volume estimation of standing trees. The most important are:

- over and/or under bark volume
- branches considered in volume functions
- broken trees
- quality (accuracy) of volume functions

5. Status quo the end of the first session

5.1. Issues to be clarified

Some general aspects have to be clarified before proceeding to the fine-tuning of the questionnaire.

- Form of questionnaire: Full list of questions or description of topics?
- Changing methodologies: Are countries asked to report past, current or future inventory methods?
- Multiple inventories: How to define the relevant inventory for the questionnaire?
- Details: It seems that very precise and detailed answers to certain questions are needed. How to achieve this?
- land use (change) in WG2 or WG1?
- volume estimation (including tree measurement for volume estimation and volume functions) in WG1 or WG2?
- Who writes and reviews the questionnaire?

5.2. Reminders

These two remarks and general guidelines have been proposed and are reported here as a reminder for future work on the questionnaire.

- The COST E43 questionnaire should focus on core variables. It will not be a repetition of the comprehensive EFICS questionnaire.
- Countries should report motivation for and experiences with their inventory system.

5.3. Varia

Several participants have prepared presentations of their national inventory system. Because of the large number of participants and the limited time frame of the meeting, it has been decided to drop presentations during the working group session.

Presentations of national inventory systems prepared for this working group meeting should be sent to Adrian Lanz. They will be placed on the COST-E43-Homepage.

Part II. 2nd session, 10 September 2004, 11:00-12:00

6. NFI description

6.1. Generalities

The working group decides that each country should provide a short description of the NFI.

- give sources of documentation (mainly Internet sources)
- only consider samples (inventory data) relevant and used for international reporting
- Switzerland will provide an example, follow the example and extend where necessary

6.2. Contents of the report

These are the minimal requirements of the NFI description.

- inventory cycle (time frame)
- only inventories relevant (used) for international reporting
- sampling design (area covered, stratification, plot layout, permanent and temporary plots)
- use of remote sensing and aerial photographs
- estimation techniques
- main thematic groups of variables
- involvement of NFI in international reporting

6.3. Timetable

The WG agrees on this very ambitious timetable for the country reports describing the NFIs.

- Swiss example will be distributed by email on 17 September 2004
- Country reports back by email: 1 October 2004

Part III.

3rd session, 10 September 2004, 13:00-14:30

7. Harmonising with WG2

7.1. Land-use and land-cover classification

Some important aspects of NFIs are of particular importance for the thematic treated by WG2. WG1 needs feedback from WG2 whether these topics should be included in the questionnaire. The first issue are land use, land cover and changes in these areas.

- land-use and land-cover sometimes mixed (should not be, definitions and classifications needed)
- some countries use CORINE land-cover categories and LUCAS land-use classes
- measurements on and classification of non-forest plots
- often NFIs are only responsible for classification inside forest areas
- for some reporting, history (changes) of plots is needed and also information for plots outside forests are needed
- could be integrated into questionnaire

7.2. Managed Forests

It seems that WG2 needs information on managed forests. However, the concept is not clear. The following remarks are collected in the WG session.

- it is not clear what is meant
- ask back in WG2 what kind of information (data) is meant (needed)
- it seems to be a difficult variable (concepts, definitions)
- are there exogenous data sources (statistics, land registers, ...)

8. Harmonising with WG3

The WG discusses a group of variables which might be of interest for WG3: information and measurements at forest edges and forest boundaries.

8.1. Forest edges and boundaries

- several countries collect - by different means - data at forest edges and boundaries
- some countries collect also data outside forest area (on plots laying in the close proximity to forests)
- WG1 does not treat this topic (WG3 has to be asked and has to decide if such data are needed)

9. Work plan of WG1

The WG discusses next steps.

- December 2004 meeting should be used to start discussion on harmonisation
- a task force (TF) prepares a draft of the questionnaire
- members of TF: Denmark, Finland, France, Austria, Switzerland, Sweden, Czech Republic
- timetable for TF: start after NFI descriptions are available (1 October); sending out draft questionnaire to WG1 members (9 November)
- responsible of TF progress: Switzerland
- at least 2-3 task force members should participate at the Gembloux meeting
- the results of the NFI descriptions should be presented at the Gembloux meeting; no volunteer found, yet, for report compilation

10. Outlook and remarks

The WG discusses in short the next steps and upcoming activities.

- in near future a list of relevant (core) international data needs has to be compiled
- WG1 documents should be stored at METLA server instead of sent around by email