

COST Action *E25*

–

European Network for long-term Forest Ecosystem and
Landscape Research

Guidelines for National Inventories of Field Research Facilities

Working document
(Fifth draft)

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Technical Report No. 2

Working Group 1: Scope of the action and guidelines for national inventories of research sites

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ABSTRACT

The objective of this technical report is to provide guidelines for the national inventories of field research facilities related to long-term forest ecosystem and landscape research, which will be included in a European database. The guidelines were developed following the scientific framework presented in the ENFORS Technical Report No. 1 "*Scientific issues related to sustainable forest management in an ecosystem and landscape perspective*". The guidelines are made up of general criteria that should apply to all field research facilities to be used in a first step of the inventories. Important general criteria are: (i) a long-term research perspective and objective, (ii) spatio-temporal scale relations, (iii) availability of documentation, and (iv) presence of linkages to other research or monitoring activities. The specific criteria that apply to different types of field research facilities will assist at the second step of the inventories, which is an iterative process for fine-tuning the database content in relation to the scientific framework and the creation of a hierarchical classification among the field research facilities.

INTRODUCTION

The "European Network for long-term Forest Ecosystem and Landscape Research" (ENFORS) is an activity within the European intergovernmental organisation for co-operation in science and technology (COST Action E25) that will run for 4 to 5 years. The overall objective of this Action is to develop the scientific basis for, and initiate a European network of field research facilities for forest ecosystem and landscape research of relevance to sustainable forest management. This network of field research facilities will be realised in the second phase of the Action and it will be based on integration of existing national field research facilities within the member countries of ENFORS (Fig. 1). In order to create this network, the first step is an inventory of existing field research facilities within Europe. Although European, this inventory will be carried out on a national basis. These guidelines are not self-standing and they are meant to be used together with the scientific framework presented in the Technical Report No. 1 of the COST Action E25 (Mårell *et al.* 2002), which defines the outer limits of the inventories.

THE NATIONAL INVENTORIES IN THE CONTEXT OF THE DEVELOPMENT OF ENFORS – THE EUROPEAN NETWORK FOR LONG-TERM FOREST ECOSYSTEM AND LANDSCAPE RESEARCH

Phase 1

The first phase in the development of the European Network for long-term Forest Ecosystem and Landscape Research (ENFORS) involves:

- defining the scientific framework;
- elaborate guidelines for national inventories of field research facilities;
- carrying out those national inventories;
- create an initial database on European field research facilities related to long-term forest ecosystem and landscape research – the ENFORS database.

These are the main tasks of Working Group (WG) 1. Some countries have already general national databases of forest research facilities, which may to varying degrees incorporate field research facilities relevant to ENFORS (*e.g.* France, the Nordic countries). These databases can be used in the national inventories, but need to be complemented with other sources of information. Other countries are in the process of creating general and specific national databases of forest field research facilities, which can be combined with the national inventories dedicated for the ENFORS database. However, it is here important to distinguish the differences between these in the light of their different aims and content. In this document, "national inventories" is in particular reference to the objectives and the scope of ENFORS, and not for any other related purposes that might operate simultaneously at the national level.

Phase 2

After the creation of the initial ENFORS database based on general criteria, there will be an iterative process of fine-tuning the specific criteria in relation to the scientific framework, classification of the field research facilities, and integrating and combining the field research facilities.

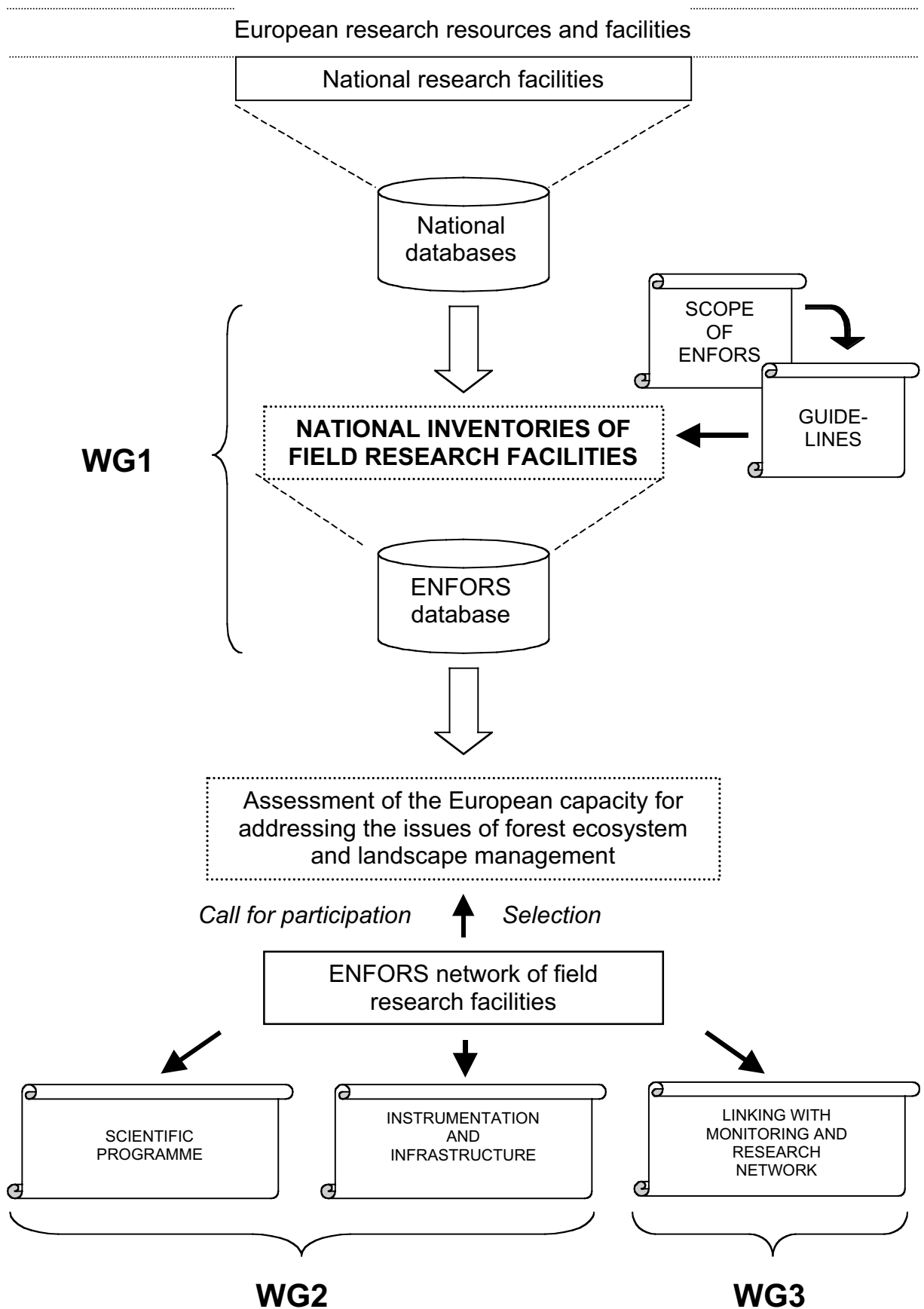


Fig. 1. The national inventories in the context of the development of the "European Network for long-term Forest Ecosystem and Landscape Research" (ENFOR).

Phase 3

In the last phase there will be the call for proposals, and the selection of field research facilities for the future Network. For this process there is a need for selection criteria, which will be different and which must be recognised and distinguished from the guidelines presented in this document. At this third phase, a scientific programme will be worked out, instrumentation and infrastructure developed, and relationships to monitoring and research networks/programmes defined for this network of field research facilities (Fig. 1). These are the tasks of WG 2 and WG 3.

OBJECTIVES OF NATIONAL INVENTORIES

The objectives of the national inventories of field research facilities are:

- to make a survey of existing field research facilities in Europe, which may contribute to long-term forest ecosystem and landscape research;
- to gather information about these facilities that will assist in evaluating their potential contribution to long-term forest ecosystem and landscape research, and their potential in complementing other facilities at local, regional and European levels.

GUIDELINES

FRAMEWORK

The scientific framework of ENFORS as presented in the Technical Report No. 1 (Mårell *et al.* 2002) defines the outer limits of the inventories. However, the national inventories should in this context be considered as a rather wide and open inventory at its initial stage – Step 1 – which is based on the general criteria. They are open in the sense that they must not exclude sites:

- that are not at present contributing with substantial research within the scientific framework, but that have the potential and aim of developing long-term forest ecosystem and landscape research;
- that are very strong with respect to a specific research aspect, but lack other important aspects presented in the scientific framework and the guidelines.

A single site is not supposed to be able to answer the whole scientific questioning related to long-term forest ecosystem and landscape research, but may complement work that is taking place in other research sites. For example, time (the long-term aspect) and space (landscape approach) constrain each other in terms of setting up a research site. It means that research that has a long term perspective is often carried out at a small spatial level, while research at large spatial levels often has a short time perspective (Fig. 2). On the other hand, the interrelationships between spatial and temporal scale are linked to the research objective. As an example, the studies of landscape changes have a long-term but not intensive approach, while the long-term intensive studies on ecosystem processes are often carried out at the site scale.

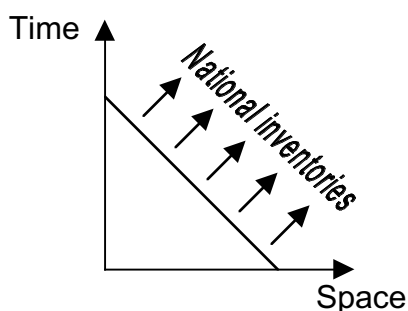


Fig. 2. The discrepancy between spatial and temporal resolution in ecosystem and experimental studies in relation to the minimum requirements for the national inventories of field research facilities in an ecosystem and landscape perspective.

Interdisciplinary is another factor that interacts and constrains the extension of a research site in space and time. It is important that the national inventories aim at the correct level; i.e. setting the base line/surface. Setting the base line/surface is an iterative process that will be initiated in the second stage – Step 2 – of the inventories.

SCIENTIFIC FRAMEWORK AND LIMITS

The national inventories of field research facilities should try to identify the following field research facilities.

- Facilities that contribute to one or more of the four main fields of interest of ENFORS, which are:
 - (1) multi-functionality of forests;

- (2) long-term trends in the environment;
- (3) land use and the role of forests in the landscape;
- (4) stochastic disturbances.
- Facilities with past and current activities that are directly relevant to one of the four research priority areas of ENFORS, which are:
 - (1) biogeochemical cycling;
 - (2) biodiversity;
 - (3) landscape and ecosystem dynamics;
 - (4) socio-economics.

More specifically, it concerns:

- facilities with a good history of biogeochemical studies at the site level and examples of studies which consider the biogeochemical interactions among spatial scales (landscape level interactions);
- studies of biodiversity change over time at site scale and of changes across landscapes characterised either by static or changing forest covers, and of the relationship between changes occurring in different groups of species across a given landscape;
- facilities where stand, site, and landscape scale models can be integrated and validated;
- studies on landscape and ecosystem dynamics, with particular reference to ecosystem stability, resilience, and resistance, which may prove to be useful concepts for integrating more process-oriented experimental studies (often short-term) and long-term forest surveillance and monitoring.

For further details about main fields of interest and research priority areas of ENFORS we refer to the Technical Report No. 1 of the COST Action E25 (Mårell *et al.* 2002).

STEP 1 – GENERAL CRITERIA

At the initial stage of the inventories, field research facilities to be included should fulfil some general criteria.

1. A specified long term research perspective or objective, which also relates to the scientific framework of ENFORS. The temporal scale will be dependent on the scientific issue of interest.
2. Long-term support (infrastructure, manpower) that is not only dependent on single and temporary, research projects, but is linked to more permanent structures such as research institutes, universities, national/regional parks, institutional agencies.
3. If criteria (2) is not completely fulfilled, as long-term financial support is sometimes difficult to obtain, the survey design and the plots themselves should be sufficiently robust that the study can be "recovered" and still be useful after some years of interruption.
4. Presence of a certain standard of documentation (meta-information about the data and spatial reference in the field, documentation of the plot, databases, *etc.*).
5. Linkage to already established research, monitoring, or experimental networks.
6. Cross-linking between spatial and temporal scales, according to the scheme outlined in these guidelines (plot-stand-landscape, short-medium-long term perspective) can be considered as an additional preferred criteria.

STEP 2 – SPECIFIC CRITERIA

The specific criteria that apply to different types of field research facilities will assist at the second step of the inventories, which is an iterative process for fine-tuning the database content in relation to the scientific framework and the creation of a hierarchical classification among the

field research facilities. Accordingly, the specific criteria presented below are likely to be adjusted, but as a start we present the following specific criteria that could apply to different types of facilities.

Non-experimental sites (e.g. nature reserves, national parks, biosphere reserves, management plans, forest inventories, and ICP level I and II plots)

- Information and research should be of an interdisciplinary nature.
- Long-term perspective, preferably more than 5-10 years.
- Documentation of management and disturbance history.
- Documentation of patterns of land-use changes.

Land-use change sites (e.g. first generation/plantation forests, natural recolonisation patterns, land-use change from agriculture/pasture to forest, and forest management change)

- Availability of a historical record of land-use changes and forest management.
- Information and research should be of an interdisciplinary nature.
- Management should be at the landscape level, dealing with management questions, links to the landowners, managers, and stakeholders are recommended.

Silvicultural experiments (e.g. growth and yield experiments)

- Preferably more than 20 years duration.
- At least at the stand level.
- Preference should be given to paired-plot experiments.

Ecosystem and watershed research sites

- Long-term perspectives, preferably more than 10 years or there must be the intention for a continuation.
- Research performed at the process level.
- Preference should be given to research sites that are adjacent to similar studies in other ecosystem and forest types.

ACKNOWLEDGEMENTS

This report is the result of two Working Group 1 meetings and the subsequent discussions among the members of the European Network for long-term Forest Ecosystem and Landscape Research. The first meeting was held September 3-4, 2001, at the Federal Forest Research Centre, Vienna, Austria, and it was organised by Ernst Leitgeb. Reinhard Hüttl and Uwe Schneider hosted the second meeting that was held April 18-20, at the Brandenburg University of Technology, Cottbus, Germany.

We are especially grateful to Olivier Laroussinie, Norbert Kräuchi, Giorgio Matteucci, Folke Andersson and Sandrine Landeau for substantial contributions to the content of this report. We also would like to acknowledge Per Gundersen, Klaus Katzensteiner, Timo Penttilä, Christine Farcy and Keith Kirby who have contributed with fruitful ideas at meetings and through other ways of communicating.

Informal meetings and discussions about the content of this report were also arranged in Austria, Czech Republic, Denmark, Italy, Netherlands, Slovenia and Sweden, for which special thanks go to those that were involved. We also know that the Working Group 1 members have been discussing the content of this report with other colleagues in their country. Therefore, we would like to express our gratitude to all the Working Group 1 members and to their colleagues who have in one way or another contributed with ideas and comments on earlier drafts of this report.

REFERENCES

- Bossard, M., Ferancec, J. and Otahel, J. 2000. CORINE land cover technical guide: Addendum 2000. European Environment Agency, Copenhagen.
- CEC. 1994. CORINE Land Cover. Technical guide. Luxembourg, Office for Official Publications of European Communities.
- European Commission DG Environment. 1999. Interpretation manual of European Union habitats (version EUR 15/2). European Commission DG Environment.
- Mårell, A., Laroussinie, O., Kräuchi, N., Matteucci, G., Andersson, F. and Leitgeb, E. *In press*. Scientific issues related to sustainable forest management in an ecosystem and landscape perspective. Technical Report No. 1, Working Group 1, COST Action E25. European Commission: Directorate-General for Research, Office for Official Publications of the European Communities, Luxembourg.



Appendix 1. Main form (page 1 of 3)



PDF Acrobat Reader (2.0 or later)
PDF Acrobat 5.0

Questionnaire – National inventories

Main form: General information

Choose one of the following three categories that best match your facility. Then, fill in the rest of the main form (Appendix 1) and the equivalent sub form (Appendix 2-4). Explanations and definitions for the questionnaire can be found in Appendix 5.

1.1. The facility is best described as:

- A. A research park – several research, monitoring and other activities clustered together within an area larger than a single forest stand.
- B. A network – Plots, sites or other facilities that are connected to each other through an inventory, a research project, a monitoring programme etc, with regional or national coverage.
- C. An individual site – A single isolated experiment, study site, monitoring plot, reference area etc.

1.2. General description of the facility: _____

FORMALITIES

1.3. Name of the facility: _____

1.4. Country: _____

1.5. Lifespan
(start – end/ongoing): _____

1.6. Responsible
organisation: _____

1.7. Contact person

1.7a. Name: _____

1.7b. Address: _____

1.7c. Tel: _____

1.7d. Fax: _____

1.7e. E-mail: _____

1.8. URL of the facility: _____

RESEARCH OBJECTIVES

1.9. Main objective: _____



Appendix 1. Main form (page 2 of 3)

The research addresses the following of

1.10. ENFORS Main fields of interest (see Mårell *et al.* [*In press*] for further details):

- Multi-functionality of forests
- Land-use and the role of forests
- Long-term trends in the environment
- Stochastic disturbances

1.11. ENFORS Priority research areas (see Mårell *et al.* [*In press*] for further details):

- Biogeochemical cycling
- Landscape and ecosystem dynamics
- Biodiversity
- Socio-economics

COLLABORATION/NETWORKS

1.12. List or describe the collaboration with other research institutes and networks:

DOCUMENTATION

Overall mark

1.13. The overall quality of the available documentation is:

- Low
- Medium
- High

Availability and accessibility of different types of information

	<i>Existent</i> <i>YES/NO</i>	<i>Accessibility</i>			<i>Periods</i> <i>(year-year)</i>
		<i>Unrestricted internet access</i>	<i>Personal request</i>	<i>Only for internal use</i>	
<i>Databases</i>					
1.14. Monitoring data	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
1.15. Research data	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
1.16. Metadata	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
<i>Remote sensing</i>					
1.17. Aerial photographs	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
1.18. Satellite images	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
<i>Historical records</i>					
1.19. Maps	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
1.20. Land-use changes	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
1.21. Socio-economic dynamics	_____	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____



Appendix 1. Main form (page 3 of 3)

Publications

1.22. Has there been made any research synthesis using the data from the facility (specify reference and language/s): _____

1.23. Number of peer-reviewed international publications: _____

1.24. Number of other scientific publications/reports: _____

1.25. List the five major references: _____

COMMENTS/SPECIFICATIONS TO THE CONTENT OF THE MAIN FORM

(Provide a separate sheet if necessary, where also additional information about the facility can be provided.)

1.26. Comments/Specifications: _____

I herewith agree to allow public access, through the use in the ENFORS database, to the above-mentioned information.

Date: _____ Signature: _____
Name: _____
Tel: _____
E-mail: _____



Questionnaire – National inventories Sub form: A. Research park

This sub form shall be filled in when the box for “Research park” has been ticked for the chosen facility on the main form. For more detailed information about individual studies and projects within the “Research park“, please use Appendix 4 as described in the instructions.

FORMALITIES

2.1. Name of the facility:

(give the same name as on the main form) _____

2.2. Country: _____

LOCALITY/ENVIRONMENTAL CHARACTERISTICS

2.3. General description of the locality: _____

2.4. Latitude

2.4a. Minimal: _____

2.4b. Maximal: _____

*Co-ordinate system
and map datum*

2.5. Longitude

2.5a. Minimal: _____

2.5b. Maximal: _____

2.6. Altitude range

2.6a. Minimal: _____

2.6b. Maximal: _____

2.7. Area: _____

2.8. Main exposure/s:

(N, NE, E, SE, etc.) _____

2.9. Biogeographical region/s:

(reference: Council Directive 92/43/EEC)

- Alpine
- Atlantic
- Boreal
- Continental
- Mediterranean

2.10. Major land cover type/s (CORINE land cover types 3 levels, <http://reports.eea.eu.int/>):

CEC. 1994. CORINE land cover. Technical guide. Luxembourg, Office for Official Publications of European Communities.

Bossard, M., Feranec, J. and Otahel, J. 2000. CORINE land cover technical guide: Addendum 2000. European Environment Agency, Copenhagen.

1. _____ 3. _____

2. _____ 4. _____



Appendix 2. Sub form: A. Research park (page 2 of 3)

2.11. Major habitat type/s (European Community habitat classification, Natura 2000, <http://europa.eu.int/comm/environment/nature/hab-en.htm>):

European Commission DG Environment. 1999. Interpretation manual of European Union habitats (version EUR 15/2). European Commission DG Environment.

1. _____	6. _____
2. _____	7. _____
3. _____	8. _____
4. _____	9. _____
5. _____	10. _____

ACCESSIBILITY TO AND TYPES OF ACCOMMODATION AND LABORATORIES

2.12. Are the following facilities easily accessible:

Accommodation Specify type/s: _____

Laboratories Specify type/s: _____

ACTIVITIES CARRIED OUT WITHIN THE RESEARCH PARK – TYPES AND SUPPORT

Type of activities

<i>Reference areas</i>	<i>Number</i>	<i>Research is carried out? YES/NO</i>	<i>Monitoring occur? YES/NO</i>
2.13. Reserves/National parks:	_____	_____	_____
2.14. Other reference areas:	_____	_____	_____

<i>Inventories/Monitoring</i>	<i>Number</i>	<i>Specification</i>
2.15. Occasional inventories:	_____	_____
2.16. Regular monitoring:	_____	_____

<i>Experimental and observational studies</i>	<i>Number of</i>		<i>Specification (You can also use Appendix 4 for a detailed description of the individual studies)</i>
	<i>Experimental studies</i>	<i>Observational studies</i>	
2.17. Biodiversity:	_____	_____	_____
2.18. Ecosystem:	_____	_____	_____
2.19. Land-use change:	_____	_____	_____
2.20. Regeneration and stand establishment:	_____	_____	_____
2.21. Stand treatment, growth and yield:	_____	_____	_____
2.22. Watershed:	_____	_____	_____
2.23. Other:	_____	_____	_____



Spatial and temporal scales addressed

	<i>Biodiversity</i>	<i>Ecosystem</i>	<i>Land-use change</i>	<i>Regeneration and stand establishment</i>	<i>Stand-treatment, growth and yield</i>	<i>Watershed</i>	<i>Other</i>
<i>Spatial scales</i>							
2.24. Plot:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.25. Stand:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.26. Landscape:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<i>Temporal scales</i>							
2.27. Diurnal/Nocturnal:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.28. Seasonal:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.29. Annual:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.30. For tens of years:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2.31. Historical:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Support

2.32. The research and monitoring activities are supported by:

- A long-term management plan
- Land owners
- Legislation
- Institutional body and governmental support
- Individual research projects and grants

COMMENTS/SPECIFICATIONS TO THE CONTENT OF THE SUB FORM: RESEARCH PARK

(Provide a separate sheet if necessary, where also additional information about the facility can be provided.)

2.33. Comments/Specifications: _____

I herewith agree to allow public access, through the use in the ENFORS database, to the above-mentioned information.

Date: _____

Signature: _____

Name: _____

Tel: _____

E-mail: _____



Questionnaire – National inventories Sub form: B. Network

This sub form shall be filled in when the box for “Network” has been ticked for the chosen facility on the main form. For more detailed information about what type of measurements or activities carried out at the basic units (plots etc.) within the “Network“, please use Appendix 4 as described in the instructions or a separate sheet of paper.

FORMALITIES

- 3.1. Name of the facility:
(give the same name as on the main form) _____
- 3.2. Country: _____

NETWORK CHARACTERISTICS – SPATIAL AND TEMPORAL EXTENT

- 3.3. General description of the network design and its spatial extent: _____

Overall spatial extent

- 3.4. *Latitude* *Co-ordinate system and map datum*
 3.4a. Minimal: _____ 3.4b. Maximal: _____
- 3.5. *Longitude*
 3.5a. Minimal: _____ 3.5b. Maximal: _____
- 3.6. *Altitude range*
 3.6a. Minimal: _____ 3.6b. Maximal: _____

Network design – spatial and temporal characteristics of the basic units

- 3.7. Total number of basic units: _____

Distribution

- 3.8. Distribution pattern of the basic units:
 Regular Grid size: _____
 Irregular



Appendix 3. Sub form: B. Network (page 2 of 4)

3.9. Basic units are distributed:

- Randomly
- Subjectively

Shape

3.10. Shape of the basic units:

- Regular
- Irregular

Size

3.11. Size of the basic units:

- Constant Size class/es: _____
- Varying Size range: _____

Visits

3.12. Visits at the basic units are made:

- Only once
- Repeatedly (e.g. permanent plots)

3.13. Return frequency for the general activities of the network:

- Regular Interval: _____
- Irregular

ENVIRONMENTAL CHARACTERISTICS

3.14. The network has a subjective/objective coverage of the following ecosystems – general description: _____

3.15. Biogeographical region/s:
(reference: Council Directive 92/43/EEC)

- Alpine
- Atlantic
- Boreal
- Continental
- Mediterranean



Appendix 3. Sub form: B. Network (page 3 of 4)

3.16. Major land cover type/s (CORINE land cover types 3 levels, http://reports.eea.eu.int/):
CEC. 1994. CORINE land cover. Technical guide. Luxembourg, Office for Official Publications of European Communities.

Bossard, M., Feranec, J. and Otahel, J. 2000. CORINE land cover technical guide: Addendum 2000. European Environment Agency, Copenhagen.

1. _____ 3. _____
2. _____ 4. _____

3.17. Major habitat type/s (European Community habitat classification, Natura 2000, http://europa.eu.int/comm/environment/nature/hab-en.htm):

European Commission DG Environment. 1999. Interpretation manual of European Union habitats (version EUR 15/2). European Commission DG Environment.

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

ACTIVITIES CARRIED OUT WITHIN THE NETWORK – TYPES AND SUPPORT

Type of activities

3.18. Describe the type of activities that are carried out within the network (research, monitoring or other): _____

3.19. Describe the type of measurement/observations that are carried out within the network (research, monitoring or other): _____

Spatial and temporal scales addressed

3.20. Spatial scales

- Plot
- Stand
- Landscape
- Regional
- National

3.21. Temporal scales

- Diurnal/Nocturnal
- Seasonal
- Annual
- For tens of years
- Historical



Support

3.22. The research and monitoring activities are supported by:

- A long-term management plan
- Land owners
- Legislation
- Institutional body and governmental support
- Individual research projects and grants

COMMENTS/SPECIFICATIONS TO THE CONTENT OF THE SUB FORM: NETWORK

(Provide a separate sheet if necessary, where also additional information about the facility can be provided.)

3.23. Comments/Specifications: _____

I herewith agree to allow public access, through the use in the ENFORS database, to the above-mentioned information.

Date: _____ Signature: _____

Name: _____

Tel: _____

E-mail: _____



Questionnaire – National inventories
Sub form: C. Individual site/study

This sub form shall be filled in either when the box for “Individual site” has been ticked for the chosen facility on the main form, or when you supply additional information about sites/plots/projects/studies within a “Research park” or a “Network”. For further details, see the instructions for national inventories.

FORMALITIES

4.1. Name of the facility:

(give the same name as on the main form)

4.1a. Give the reference to another connected facility if the above site, plot, project or study is included in an earlier reported “A. Research park” or “B. Network”.

4.2. Country:

LOCALITY/ENVIRONMENTAL CHARACTERISTICS

4.3. General description of the locality: _____

4.4. Latitude

*Co-ordinate system
and map datum*

4.4a. Minimal: _____

4.4b. Maximal: _____

4.5. Longitude

4.5a. Minimal: _____

4.5b. Maximal: _____

4.6. Altitude range

4.6a. Minimal: _____

4.6b. Maximal: _____

4.7. Area: _____

4.8. Main exposure/s:

(N, NE, E, SE, etc.) _____

4.9. Biogeographical region/s:

(reference: Council Directive 92/43/EEC)

- Alpine
- Atlantic
- Boreal
- Continental
- Mediterranean



Appendix 4. Sub form: C. Individual site/study (page 2 of 3)

4.10. Major land cover type/s (CORINE land cover types 3 levels, http://reports.eea.eu.int/):
CEC. 1994. CORINE land cover. Technical guide. Luxembourg, Office for Official Publications of European Communities.

Bossard, M., Feranec, J. and Otahel, J. 2000. CORINE land cover technical guide: Addendum 2000. European Environment Agency, Copenhagen.

1. _____ 3. _____
2. _____ 4. _____

4.11. Major habitat type/s (European Community habitat classification, Natura 2000, http://europa.eu.int/comm/environment/nature/hab-en.htm):

European Commission DG Environment. 1999. Interpretation manual of European Union habitats (version EUR 15/2). European Commission DG Environment.

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

ACCESSIBILITY TO AND TYPES OF ACCOMMODATION AND LABORATORIES

4.12. Are the following facilities easily accessible:

Accommodation Specify type/s: _____
 Laboratories Specify type/s: _____

ACTIVITIES CARRIED OUT WITHIN THE INDIVIDUAL SITE – TYPES AND SUPPORT

Type of activities

4.13. Describe the type of general activities that are carried out within the individual site (research, monitoring or other): _____

4.14. Describe the type of measurement/observations that are carried out within the individual site: _____



Spatial and temporal scales addressed

4.15. Spatial scales

- Plot
- Stand
- Landscape
- Regional
- National

4.16. Temporal scales

- Diurnal/Nocturnal
- Seasonal
- Annual
- For tens of years
- Historical

Support

4.17. The research and monitoring activities are supported by:

- A long-term management plan
- Land owners
- Legislation
- Institutional body and governmental support
- Individual research projects and grants

COMMENTS/SPECIFICATIONS TO THE CONTENT OF THE SUB FORM: INDIVIDUAL SITE

(Provide a separate sheet if necessary, where also additional information about the facility can be provided.)

4.18. Comments/Specifications: _____

I herewith agree to allow public access, through the use in the ENFORS database, to the above-mentioned information.

Date: _____

Signature: _____

Name: _____

Tel: _____

E-mail: _____



Questionnaire – National inventories

Expected normalised content for the forms: Definitions

Please provide any additional information on a separate sheet of paper together with the reference number, if ever there is not enough allocated space on the forms for specific questions and the subsequently requested information.

1. Main form

MAJOR CATEGORY OF FACILITY

The general idea with the ENFORS database is to create a hierarchical classification among the research facilities within the database. This will be discussed in more detail at the WG 1 meeting November 8-9, 2002, in Copenhagen. However, a first hierarchical structure – in terms of the character of the site – have been made according to the type of facilities that was provided during the test of the guidelines. Three major categories of sites were distinguished as being of relevance to ENFORS.

A. Research park: several research, monitoring or other activities clustered within an area larger than a single forest stand. E.g. experimental forests and field stations with several experiments, research projects and monitoring activities close by.

B. Network: plots, sites or other facilities that are connected with each other through an inventory, a research project, a monitoring programme etc., and with a regional or national coverage.

C. Individual site: single isolated experiments, study sites, monitoring plots, reference areas etc. of high relevance to ENFORS because of its uniqueness concerning a specific research topic, study design, data series etc.

1.1. Type of facility

At this stage of the inventories, all research facilities that are of interest to be included in the ENFORS database should be able to fit into one of the three provided categories. However, if you have a facility that you clearly think fits into the scope of ENFORS, but doesn't fit into any of the three categories. Then, you should not hesitate to send in detailed information (roughly corresponding to the information requested on the forms) about this facility on a separate sheet of paper.

1.2. General description of the facility

Here you have the possibility to specify in your own words and in more detail what type of facility it is.

FORMALITIES

The “Formalities” aims at giving information about the site that makes it possible to identify the facility and to make personal contacts with those in charge of it.

1.3. Name of the facility

The official and recognised name of the facility (study site, research/monitoring project, nature reserve, inventory, experiment etc.).



1.4. Country

The country within which the facility is situated.

1.5. Lifespan

The year of establishment and present status (ended year XXXX or ongoing). Fill in gaps if any and the prospective future.

1.6. Responsible organisation

The institutional body in charge of and co-ordinating the activities.

1.7. Contact person

The name and the address of the contact person/s.

1.8. URL of the facility

The internet address to the homepage of the facility.

RESEARCH OBJECTIVES

The “Research objectives” aims at giving information about the main direction of the activities carried out at the facility. It also aims at answering to which degree those activities include the scientific issues of ENFORS.

1.9. Main objective

The overall research objective of the facility.

1.10. ENFORS Main fields of interests

Specify if the research or monitoring activities carried out address any of the main fields of interests as they were specified in the ENFORS Technical report no. 1 (Mårell *et al. In press*).

1.11. ENFORS Priority research areas

Specify if the research or monitoring activities carried out address any of the priority research areas defined in the ENFORS Technical report no. 1 (Mårell *et al. In press*).

COLLABORATION/NETWORKS

The “Collaboration/Networks” aims at providing information about the extent of already existing collaboration and links to other kind of networks.

1.12. Collaboration and links to networks

Provide a list with the name and type of collaboration with other major national/international research/monitoring institutes and networks. Additional information as contact addresses and websites to the collaboration and the network partners are also useful.

DOCUMENTATION

The “Documentation” aims at providing information about the availability of different types of information resources and to which degree these are accessible to the ENFORS members and other researchers. It also aims at providing information about results obtained from the facility.



Overall mark

1.13. Overall quality of available documentation

Make a subjective judgement of the overall quality of the available documentation. Those facilities that have a wide range of different information resources with high resolution and accuracy, and long data series without gaps should be given a high mark. While those facilities with few information resources (additional to the main activity), and lots of gaps and missing data should be given a low mark.

Availability and accessibility of different types of information

Specify for each of the information resources 1.14 – 1.21 whether this information exist for the facility and the surroundings. If an information resource is existent, then also specify its accessibility (three classes).

Class A. Unrestricted internet access means that any one can download the information from a server without providing any information about himself and the intended use of the information.

Class B. Personal request means that the information is available, but only after personal contact with the personnel in charge of the information. This often also includes a statement of its intended use.

Class C. Only for internal use means that only researchers directly involved have access to and use the data and information.

For the same type of information there might be different restrictions on the accessibility of the information depending on the level or age of the data. In that case, tick the equivalent classes and specify the criteria used for differentiating the data access.

Databases

Please provide the URL address or the contact person for the databases when the information is available on internet or through personal request.

1.14. Monitoring data

Data measurements that are made continuously (or at regular intervals) during a long time period (>10 years) or has the intention to be measured over a long time period (>10 years).

1.15. Research data

Data collected or measured for a particular research project only during a short time period (<10 years).

1.16. Metadata

Metadata is information about data or other information.

Remote sensing

1.17. Aerial photographs

1.18. Satellite images

Historical records

1.19. Maps



1.20. Land-use changes

1.21. Socio-economic dynamics

Publications

Abstracts and summaries of research synthesis and major references can be provided on a separate sheet of paper.

1.22. Research synthesis

Provide the reference/s (specifying also in which language it is available) of research synthesis that has been made using the research data and results from the facility.

1.23. Peer-reviewed international publications

Specify or estimate the number of peer-reviewed international publications that has been produced based on the data and the results from the facility.

1.24. Other scientific publications/reports

Specify or estimate the number of other scientific publications/reports (not peer-reviewed international publications) that has been produced based on the data and the results from the facility.

1.25. Major references

List up to five of the major references/publications resulting from the research carried out at the facility.

COMMENTS/SPECIFICATIONS TO THE CONTENT OF THE MAIN FORM

1.26. Comments/Specifications

Here you can make specifications to the provided information, add other information about the facility that is of relevance, or comment the questionnaire as a whole. Provide a separate sheet of paper if necessary.

2. Sub form: A. Research park

FORMALITIES

The “Formalities” on the sub form aims at giving a reference/link to the main form.

2.1. Name of the facility

The same name as on the main form.

2.2. Country

See above 1.4.

LOCALITY/ENVIRONMENTAL CHARACTERISTICS

The “Locality/Environmental characteristics” aims at describing the geographical position and the environmental conditions for the facility.

2.3. General description of the locality

Here you can describe with your own words and in general terms where the facility is situated and what kind of environmental conditions that characterise the site.



Appendix 5. Sub form: Expected normalised content for the forms- definitions (page 5 of 11)

2.4. Latitude

Provide the minimal and maximal latitude enclosing the facility. For small sites minimal and maximal latitude will coincide because of the low resolution required. Please specify which co-ordinate system and map datum that have been used (degrees and hours preferably in WGS 84 map datum).

2.5. Longitude

Provide the minimal and maximal longitude enclosing the facility. For small sites minimal and maximal longitude will coincide because of the low resolution required. Please specify the co-ordinate system (geodetic lat./long., ECEF Cartesian co-ordinates, UTM co-ordinates, national grid system etc.) and the map datum (i.e. the size and shape of the earth/nation, and the origin and orientation of the co-ordinate systems used to map the earth/nation such as WGS 84) that have been used.

Recommendations

Co-ordinate system: Geodetic latitude and longitude in decimal degrees or degrees and hours.
Map datum: WGS 84.

2.6. Altitude range

The minimal and the maximal altitude of the facility.

2.7. Area

The surface area (km² or ha) of the facility.

2.8. Main exposure/s

Main exposure of the facility (classes: N, NE, E, SE, S, SW, W, NW).

2.9 Biogeographical region/s

Specify the biogeographical region/s within which the facility is situated. See the Council Directive 92/43/EEC for definitions of the regions (Alpine, Atlantic, Boreal, Continental or Mediterranean).

2.10. Major land cover type/s

List the major land cover type/s of the facility. It is recommended to use the CORINE land cover types at 3 levels (2.3.1. Pastures, 3.1.1. Broad-leaved forest, etc.). The definitions can be downloaded from the website of the European Environment Agency:

<http://reports.eea.eu.int/>

CEC. 1994. CORINE Land Cover. Technical guide. Luxembourg, Office for Official Publications of European Communities.

Bossard, M., Feranec, J. and Otahel, J. 2000. CORINE land cover technical guide: Addendum 2000. European Environment Agency, Copenhagen.

2.11. Major habitat type/s

List the major habitat type/s of the facility. It is recommended to use the European Community habitat classification for the Natura 2000. The definitions can be downloaded from the Europa server: <http://europa.eu.int/comm/environment/nature/hab-en.htm>.

Appendix 5. Sub form: Expected normalised content for the forms- definitions (page 1 of 11)



European Commission DG Environment. 1999. Interpretation manual of European Union habitats (version EUR 15/2). European Commission DG Environment.

ACCESSIBILITY AND TYPES OF ACCOMMODATION AND LABORATORIES

The “Accessibility and types of accommodation and laboratories” aims at describing the capacity of the facility to host guest researchers and its self-supporting with regard to laboratory analyses.

2.12. Accommodation and laboratories

Specify the type of accommodation (hotels, self-catering, camping etc.) located nearby the facility and the type of laboratories at or nearby the facility that can be used for analysing collected data material.

ACTIVITIES CARRIED OUT WITHIN THE RESEARCH PARK – TYPES AND SUPPORT

The “Activities carried out within the Research park – types and support” aims at describing the type of activities (research, monitoring and other activities) and reference areas that the facility provides.

Reference areas

Specify the number and type of reference areas that are situated within the facility, and if research and monitoring activities are allowed and carried out within those reference areas.

2.13. Reserves/National parks

2.14. Other reference areas

Inventories/Monitoring

Specify the number and type of inventories that has been carried out within the facility.

2.15. Occasional inventories

2.16. Regular monitoring

Experimental and observational studies

Specify for each type of study category the number of experimental and observational studies that has been or is being carried out at the facility. Detailed descriptions of specific studies and projects can be given by filling in a new main form and the sub form for “Individual sites” (Appendix 4).

2.17. Biodiversity

2.18. Ecosystem

2.19. Land-use change

2.20. Regeneration and stand establishment

2.21. Stand treatment, growth and yield

2.22. Watershed

2.23. Other

Spatial and temporal scales addressed

Specify for each category of experimental and observational studies the spatial and temporal scales that are being addressed by the research and monitoring activities that are being carried out at the facility.



Spatial scales

2.24. Plot

A carefully measured area laid out for experimentation or measurement that contain up to a few trees, but not including a complete forest stand.

2.25. Stand

A community of trees sufficiently uniform in species composition, age, arrangement, and condition to be distinguishable as a group from the forest or other growth on the adjoining area, and thus forming a silviculture or management entity
(<http://www.for.gov.bc.ca/pab/publctns/glossary/GLOSSARY.HTM>).

2.26. Landscape

“A heterogeneous land area composed of a cluster of interacting ecosystems that is repeated in similar form throughout” (Forman, R.T.T. and Gordon, M. 1986. Landscape ecology. New York, Wiley.).

Temporal scales

2.27. Diurnal/Nocturnal

Relates to processes caused by or correlated to day and night.

2.28. Seasonal

Relates to processes caused by or correlated to seasonal variation.

2.29. Annual

Relates to processes caused by or correlated to annual variation.

2.30. For tens of years

Relates to processes caused by or correlated to fluctuations and variations occurring for tens of years or more.

2.31. Historical

Relates to processes caused by or correlated to fluctuations and variations occurring for hundreds of years or more.

Support

2.32. The research and monitoring activities are supported by

Specify the different type of financial, legislative and other resource related support that is given to the facility.

COMMENTS/SPECIFICATIONS TO THE CONTENT OF THE SUB FORM: RESEARCH PARK

2.33. Comments/Specifications

Here you can make specifications to the provided information, add other information about the facility that is of relevance, or comment the sub form as a whole. Provide a separate sheet of paper if necessary.

3. Sub form: B. Network

FORMALITIES



The “Formalities” on the sub form aims at giving a reference/link to the main form.

3.1. Name of the facility

The same name as on the main form.

3.2. Country

See above 1.4.

NETWORK CHARACTERISTICS – SPATIAL AND TEMPORAL EXTENT

3.3. General description of the network design and its spatial extent

Here you can describe with your own words and in general terms the type of network it concerns and spatial and temporal dimension.

Overall spatial extent

3.4. Latitude

See above 2.4.

3.5. Longitude

See above 2.5.

3.6. Altitude range

See above 2.6.

Network design – spatial and temporal characteristics of the basic units

3.7. Total number of basic units

The total number of basic units (e.g. plots) that compose the network.

Distribution

3.8. Distribution pattern of the basic units

Specify whether the basic units are spatially distributed in a regular or irregular pattern. For regular patterns, add the grid size (i.e. the distance between the basic units).

3.9. Basic units are distributed

Specify whether the basic units are spatially distributed through a random or subjective process.

Shape

3.10. Shape of the basic units

Specify whether the shape of the basic units are regular (circle, square etc.) or irregular.

Size

3.11. Size of the basic units

Specify whether the size of the basic units is constant (with further specification of size class/es) or varying (with further specification about maximum and minimum size).

Visits

3.12. Visits at the basic units



Appendix 5. Sub form: Expected normalised content for the forms- definitions (page 9 of 11)

Specify whether the basic units are visited only once (e.g. plots that are randomly allocated for each inventory or measurement event) or repeatedly (e.g. permanent plots).

3.13. Return frequency for the general activities of the network

Specify whether return visits are made at regular (with further specification about time interval) or irregular intervals. When an inventory is made only once and no replications of the inventory is planned, then specify “Regular – interval 0”.

ENVIRONMENTAL CHARACTERISTICS

3.14. Network coverage – general description

Here you can describe with your own words and in general terms what kind of environmental conditions and ecosystems that network represent (i.e. an objective sample of all forest ecosystem occurring in the country, all types of broad-leaved forests in a particular geographical or biogeographical region etc.).

3.15 Biogeographical region/s

See above 2.9.

3.16. Major land cover type/s

See above 2.10.

3.17. Major habitat type/s

See above 2.11.

ACTIVITIES CARRIED OUT WITHIN THE NETWORK – TYPES AND SUPPORT

The “Activities carried out within the Network – types and support” aims at describing the type of activities (research, monitoring and other activities) and reference areas that the facility provides.

3.18. General activities (research, monitoring and other)

Describe the type of general activities that are carried out within the individual site (type of research, monitoring and other activities).

3.19. Measurements/observations

Describe the type of measurements/observations that are carried out within the individual site.

3.20. Spatial scales

Specify the spatial scales that are being addressed by the research and monitoring activities that are being carried out at the facility. For definitions of the scales see above 2.24-2.26.

3.21. Temporal scales

Specify the temporal scales that are being addressed by the research and monitoring activities that are being carried out at the facility. For definitions of the scales see above 2.27-2.31.

3.22. The research and monitoring activities are supported by

See above 2.32.



Appendix 5. Sub form: Expected normalised content for the forms- definitions (page 10 of 11)

COMMENTS/SPECIFICATIONS TO THE CONTENT OF THE SUB FORM: NETWORK

3.23. Comments/Specifications

Here you can make specifications to the provided information, add other information about the facility that is of relevance, or comment the sub form as a whole. Provide a separate sheet of paper if necessary.

4. Sub form: C. Individual site

FORMALITIES

The “Formalities” on the sub form aims at giving a reference/link to the main form.

4.1. Name of the facility

The same name as on the main form.

4.1a. Reference to another connected facility

This question should only be answered when the “Individual site” that you report on this form is connected to an earlier reported “Research park” or “Network”. If you have chosen to give such additional information about a specific site, project, plot or study that is included in an earlier reported “Research park” or “Network” (on another main and sub form). Then write here the name of that main facility (“Research park” or “Network”) as it was given on that main form.

4.2. Country

See above 1.4.

LOCALITY/ENVIRONMENTAL CHARACTERISTICS

The “Locality/Environmental characteristics” aims at describing the geographical position and the environmental conditions for the facility.

4.3. General description of the locality

Here you can describe with your own words and in general terms where the facility is situated and what kind of environmental conditions that characterise the site.

4.4. Latitude

See above 2.4.

4.5. Longitude

See above 2.5.

4.6. Altitude range

See above 2.6.

4.7. Area

See above 2.7.

4.8. Main exposure/s

See above 2.8.



Appendix 5. Sub form: Expected normalised content for the forms- definitions (page 11 of 11)

4.9 Biogeographical region/s
See above 2.9.

4.10. Major land cover type/s
See above 2.10.

4.11. Major habitat type/s
See above 2.11.

ACCESSIBILITY AND TYPES OF ACCOMMODATION AND LABORATORIES

The “Accessibility and types of accommodation and laboratories” aims at describing the capacity of the facility to host guest researchers and its self-supporting with regard to laboratory analyses.

4.12. Are the following facilities easily accessible
See above 2.12.

ACTIVITIES CARRIED OUT WITHIN THE INDIVIDUAL SITE – TYPES AND SUPPORT

The “Activities carried out within the Individual site – types and support” aims at describing the type of activities (research, monitoring and other activities) and reference areas that the facility provides.

4.13. General activities (research, monitoring and other)
See above 3.18.

4.14. Measurements/observations
See above 3.19.

4.15. Spatial scales
See above 3.20. For definitions of the scales see above 2.24-2.26.

4.16. Temporal scales
See above 3.21. For definitions of the scales see above 2.27-2.31.

4.17. The research and monitoring activities are supported by
See above 2.32.

COMMENTS/SPECIFICATIONS TO THE CONTENT OF THE SUB FORM: NETWORK

4.18. Comments/Specifications

Here you can make specifications to the provided information, add other information about the facility that is of relevance, or comment the sub form as a whole. Provide a separate sheet of paper if necessary.

Appendix 16. *Working Group 1 members and other contributors*

Country	Name	Affiliation
Austria	Klaus Katzensteiner	Institute of Forest Ecology, University of Agricultural Sciences
	Ernst Leitgeb	Department of Forest Ecology, Federal Forest Research Centre
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Bulgaria	Ivan Raev	Forest Research Institute, Bulgarian Academy of Sciences
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	Jiri Kulhavy	Institute of Forest Ecology, Mendel University of Agriculture and Forestry
Denmark	Bohumir Lomsky	Forestry and Game Management Research Institute
	Per Gundersen	Department of Forest Ecology, Danish Forest and Landscape Research
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	Bernd Uwe Schneider	Chair for Soil Protection and Recultivation, Brandenburg University of Technology
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Ireland	Ted Farrell	Department of Environmental Resource Management, University College Dublin
	Andrea Cutini	Forest Research Institute
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<i>Country</i>	<i>Name</i>	<i>Affiliation</i>
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	Isabel Canellas	INIA, Forest Research Centre
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