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(Acts whose publication is obligatory)

**COMMISSION REGULATION (EC) No 1737/2006
of 7 November 2006**

laying down detailed rules for the implementation of Regulation (EC) No 2152/2003 of the European Parliament and of the Council concerning monitoring of forests and environmental interactions in the Community

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to Regulation (EC) No 2152/2003 of the European Parliament and of the Council of 17 November 2003 concerning monitoring of forests and environmental interactions in the Community ⁽¹⁾, and in particular Articles 4(2), 5(5), 6(4), 7(3), 8(6), 9(6), 10(2), 14(5) and 15(4) thereof,

Whereas:

- (1) With effect from 1 January 2003, Regulation (EC) No 2152/2003 provides the basis to continue and further develop, with an integrated approach, the measures previously carried out under Council Regulation (EEC) No 3528/86 of 17 November 1986 on the protection of the Community's forests against atmospheric pollution ⁽²⁾ and Council Regulation (EEC) No 2158/92 of 23 July 1992 on protection of the Community's forests against fire ⁽³⁾. Regulation (EC) No 2152/2003 also provides possibilities to address new environmental issues of relevance for the Community in the future.
- (2) At present the following Regulations apply: Commission Regulation (EEC) 1696/87 of 10 June 1987 laying down certain detailed rules for the implementation of Council Regulation (EEC) No 3528/86 on the protection of the Community's forests against atmospheric pollution ⁽⁴⁾, Commission Regulation (EC) No 804/94 of 11 April 1994 laying down certain detailed rules for the application of Council Regulation (EEC) No 2158/92 as regards forest-fire information systems ⁽⁵⁾, Commission Regulation (EC) No 1091/94 of 29 April 1994 laying down certain

detailed rules for the implementation of Council Regulation (EEC) No 3528/86 on the protection of the Community's forests against atmospheric pollution ⁽⁶⁾, Commission Regulation (EC) No 1727/1999 of 28 July 1999 laying down certain detailed rules for the application of Council Regulation (EEC) No 2158/92 on protection of the Community's forests against fire ⁽⁷⁾, Commission Regulation (EC) No 2278/1999 of 21 October 1999 laying down certain detailed rules for the application of Council Regulation (EEC) No 3528/86 on the protection of the Community's forests against atmospheric pollution ⁽⁸⁾. For the purpose of implementing the provisions of Regulation (EC) No 2152/2003, certain provisions of following implementing Regulations should continue to apply, while others should be amended. In the interest of effectiveness, clarity and rationality, those Regulations should be replaced by a single text, and the provisions that are still relevant should be incorporated into that text.

- (3) The monitoring of air pollution effects on forests should continue to be carried out on the basis of the systematic network of observation points and of the network of observation plots for intensive and continuous monitoring, established and implemented under Regulation (EEC) No 3528/86 and Regulations (EEC) No 1696/87 and (EC) No 1091/94.
- (4) The development of new monitoring activities should be limited to pilot phase actions in carrying out studies, experiments and demonstration projects in order to identify options for the establishment of such new monitoring activities.
- (5) Detailed rules and guidelines for the implementation of Articles 6(3) and 16(3) of Regulation (EC) No 2152/2003, as regards the establishment of new monitoring activities and the reporting of the results of these new activities are not needed for the period 2003 to 2006 as such monitoring activities are not foreseen to be implemented during this period.

⁽¹⁾ OJ L 324, 11.12.2003, p. 1. Regulation as last amended by Regulation (EC) No 788/2004 (OJ L 38, 30.4.2004, p. 17).

⁽²⁾ OJ L 326, 21.11.1986, p. 2. Regulation as last amended by Regulation (EC) No 804/2002 of the European Parliament and of the Council (OJ L 32, 17.5.2002, p. 1).

⁽³⁾ OJ L 217, 31.7.1992, p. 3. Regulation as last amended by Regulation (EC) No 805/2002 of the European Parliament and of the Council (OJ L 32, 17.5.2002, p. 3).

⁽⁴⁾ OJ L 161, 22.6.1987, p. 1. Regulation as last amended by Regulation (EC) No 2278/1999 (OJ L 279, 29.10.1999, p. 3).

⁽⁵⁾ OJ L 93, 12.4.1994, p. 11.

⁽⁶⁾ OJ L 125, 18.5.1994, p. 1. Regulation as last amended by Regulation (EC) No 2278/1999.

⁽⁷⁾ OJ L 203, 3.8.1999, p. 41. Regulation as amended by Regulation (EC) No 2121/2004 (OJ L 367, 14.12.2004, p. 17).

⁽⁸⁾ OJ L 279, 29.10.1999, p. 3. Regulation as amended by Regulation (EC) No 2121/2004.

- (6) The manual on parameters, monitoring methods and data formats referred to in Article 10 of Regulation (EC) No 2152/2003 is based on the monitoring provisions set out in the Annexes to Regulations (EEC) No 1696/87, (EC) No 804/94 and (EC) No 1091/94. In the light of recent technical progress it is however necessary to revise those provisions. In particular the methodology for the crown condition surveys on the systematic network of observation points and the network of observation plots for intensive monitoring should be merged. The manual should also cover methodologies for the additional monitoring activities on issues such as phenology, ambient air quality, ozone injury and litterfall.
- (7) Monitoring of forest fires should continue to be carried out on the basis of the European Forest Fire Information System, (EFFIS). EFFIS has been built on the achievements of the Community information system on forest fires, established and implemented under Regulation (EEC) No 2158/92 and Regulation (EC) No 804/94 and includes additional information gathered by the Joint Research Centre under the Forest Fire Risk Forecasting System (EFFRFS) and the European Forest Fire Damage Assessment System (EFFDAS).
- (8) Prevention measures against forest fires should be established building on the achievements of Regulation (EEC) No 2158/92 provided that such measures are not supported through Council Regulation (EC) No 1257/99 of 17 May 1999 on support for rural development from the European Agricultural Guidance and Guarantee Fund (EAGGF) and amending and repealing certain Regulations ⁽¹⁾ and provided they are not included in the rural development programmes drawn up by the Member States. This Regulation should establish common core data to be submitted by Member States for any forest fires occurred in their territory as well as technical specifications for the supply of such data.
- (9) For the purpose of ensuring coherence with other Community funded activities and to avoid duplications and double funding, proposals for studies, experiments and demonstration projects submitted by the Member States pursuant to Articles 5, 6 and 7 of Regulation (EC) No 2152/2003 should be evaluated by the Commission according to specified criteria.
- (10) In order to ensure that such studies, experiments and demonstration projects are adapted to on-going issues and respond to actual needs in the field of forest monitoring it will be necessary to establish a ranking of priorities for granting Community support to such activities.
- (11) The setting up of the national programmes and the financial aspects related to it should in particular take account of the provisions of Council Regulation (EC, Euratom) No 1605/2002 of 25 June 2002 on the Financial Regulation applicable to the general budget of the European Communities ⁽²⁾ and Commission Regulation (EC, Euratom) No 2342/2002 of 23 December 2002 laying down detailed rules for the implementation of Council Regulation (EC, Euratom) No 1605/2002 on the Financial Regulation applicable to the general budget of the European Communities ⁽³⁾.
- (12) Eligibility rules should be introduced to define the scope of costs considered eligible for Community part financing.
- (13) The Scientific Advisory Group to be established pursuant to Article 9(3) of Regulation (EC) No 2152/2003 should advise the Standing Forestry Committee on technical matters of the monitoring scheme.
- (14) Each Member State should designate a competent body on the basis of criteria established by the basic act according to Article 54(2)(c) of Regulation (EC, Euratom) No 1605/2002 in order to ensure compliance with the requirements of a sound financial management and full respect of the principles of non-discrimination and transparency. The Member States, which should have the legal and financial responsibility for implementing the approved national programme, should be responsible for any irregularities, neglect or fraud of the competent body.
- (15) In view of their decentralised administrative organisational structures, Belgium, Germany and Portugal should be allowed to designate more than one competent body.
- (16) Data forwarded by Member States within the framework of Regulation (EC) No 2152/2003 to the Commission should be considered as documents within the meaning of Regulation (EC) No 1049/2001 of the European Parliament and of the Council of 30 May 2001 regarding public access to European Parliament, Council and Commission documents ⁽⁴⁾.
- (17) The measures provided for in this Regulation are in accordance with the opinion of the Standing Forestry Committee established by Council Decision 89/367/EEC ⁽⁵⁾,

⁽¹⁾ OJ L 160, 26.6.1999, p. 80. Regulation as last amended by Regulation (EC) No 1698/2005 (OJ L 277, 21.10.2005, p. 1).

⁽²⁾ OJ L 248, 16.9.2002, p. 1.

⁽³⁾ OJ L 357, 31.12.2002, p. 1. Regulation as last amended by Regulation (EC, Euratom) No 1248/2006 (OJ L 227, 19.8.2006, p. 3).

⁽⁴⁾ OJ L 145, 31.5.2001, p. 43.

⁽⁵⁾ OJ L 165, 15.6.1989, p. 14.

HAS ADOPTED THIS REGULATION:

Article 4

Transmission of data

CHAPTER I

SUBJECT MATTER

Article 1

This Regulation lays down the detailed rules for the implementation of Article 4, Article 5(1) and (2), Article 6(1) and (2), Article 7(1) and (2), Article 8, Article 9(3), Articles 10 and 14, and Article 15(1) of Regulation (EC) No 2152/2003.

CHAPTER II

MONITORING OF AIR POLLUTION EFFECTS

SECTION 1

NETWORK OF OBSERVATION POINTS

(Article 4(1)(a) and 10(1) of Regulation (EC) No 2152/2003)

Article 2

Systematic network of observation points and monitoring

1. The systematic network of observation points, hereinafter 'Level I points', corresponding to a grid composed of units measuring 16×16 km, covering the entire territory of each Member State, hereinafter referred to as 'the grid', shall be utilised to carry out annual crown conditions surveys.

Those surveys shall be carried out using the methods set out in Chapter 2 of Annex I.

2. Observations shall be made at each intersection point falling on forested land.

3. Member States may use denser networks than the Level I points where it is necessary for the preparation of their annual reports in accordance with Article 15(1) of Regulation (EC) No 2152/2003, and in order to obtain representative data at a national or regional level.

Article 3

Exceptions concerning the grid density

1. A sub-sample of the grid with units measuring 32×32 km may be used for the inventory covering other wooded land.

2. A sub-sample of the grid with units measuring 32×32 km may also be used for the inventory covering the large homogeneous forest areas situated in Finland north of $65^{\circ} 30'$ latitude and in Sweden north of 59° latitude.

1. By 15 December each year, each Member State shall forward to the Commission the data collected during the preceding year for each Level I point using the methods and forms set out in Chapter 14 of Annex I.

In addition to that data, Member States shall submit a data accompanying report setting out background information on the monitoring methods applied. That report shall be drawn up in accordance with Chapter 13 and point IV.1 of Chapter 14 of Annex I.

The instructions and codes set out in Chapter 15 of Annex I shall be used for the transmission of data collected in accordance with the first subparagraph.

2. Data related to privately owned land shall be geo-referenced by latitude and longitude coordinates expressed at least in degrees and in minutes. All other data shall be geo-referenced in terms of latitude and longitude coordinates expressed in degrees and in minutes and in seconds.

3. The part of the data accompanying report describing the monitoring methods shall remain valid until those methods are changed.

SECTION 2

NETWORK OF OBSERVATION PLOTS

(Article 4(1)(b) and Article 10(1) of Regulation (EC) No 2152/2003)

Article 5

Establishment of observation plots for intensive monitoring

1. The network of permanent observation plots established by the Member States, hereinafter 'Level II plots', shall be used for intensive and continuous monitoring of air pollution effects on forest ecosystems. The number of Level II plots to be selected for that network shall be limited to 15 for each Member State.

However, Member States may select a larger number of Level II plots on the condition that the number does not exceed 20 % of the number of national Level I points.

2. Once a new or additional Level II plot is established Member States shall together with the first data transmission concerning that plot forward a review of the selection criteria and a complete list of all plots to the Commission, including basic information such as location, that is to say longitude, latitude and altitude, and species, as well as general plot information for each Level II plot installed in a standardised form.

3. The Level II plots shall be selected using the common methods set out in Chapter 1 of Annex I.

*Article 6***Monitoring**

The intensive and continuous monitoring of the forest ecosystems shall include the following:

- (a) the continuous inventory of crown condition, foliar chemistry measurements and increment changes, on each observation Level II plot in accordance with Chapters 2, 3 and 4 of Annex I;
- (b) measurements of deposition chemistry, meteorology and soil solution chemistry, as well as assessment of ground vegetation, on at least 10 % of the observation Level II plots in accordance with Chapters 5 to 8 of Annex I;
- (c) where appropriate, other monitoring activities such as assessment of ambient air quality, visible ozone injury and litterfall and phenological observations in accordance with Chapters 9 to 12 of Annex I.

*Article 7***Transmission of data**

1. By 15 December each year Member States shall forward to the Commission all data measured during the preceding year for each Level II plot using the methods and forms set out in Chapter 14 of Annex I.

In addition to that data, Member States shall submit a data accompanying report setting out the background information on the monitoring methods applied. That report shall be drawn up in accordance with Chapter 13 and point IV.1 of Chapter 14 of Annex I.

The instructions and codes set out in Chapter 15 of Annex I shall be used for the transmission of data collected in accordance with the first subparagraph.

2. Data related to privately owned land shall be geo-referenced by latitude and longitude coordinates expressed respectively at least in degrees and in minutes. All other data shall be geo-referenced in terms of latitude and longitude coordinates expressed respectively in degrees and in minutes and in seconds.

3. The part of the data accompanying report describing the monitoring methods shall remain valid until those methods are changed.

CHAPTER III

EUROPEAN FOREST FIRE INFORMATION SYSTEM

(Article 5(1) of Regulation (EC) No 2152/2003)

*Article 8***Information covered**

1. The European Forest Fire Information System (EFFIS) shall be operated by the Joint Research Centre of the Commission.

2. The following data shall be recorded in EFFIS:

- (a) the common core data submitted in accordance with Article 9;
- (b) additional data for forest fires affecting areas of at least 50 hectares submitted in accordance with Article 10;
- (c) information provided by the Joint Research Centre on forecast of fire risk within the framework of the European Forest Fire Risk Forecasting System (EFFRFS) and on mapping and evaluation of damages caused by fire which affect an area of at least 50 hectares within the framework of the European Forest Fire Damage Assessment System (EFFDAS).

*Article 9***Common core data**

1. By 1 July each year, each Member State shall submit to the Commission the common core data for every forest fire which has occurred in their territory during the preceding year. The common core data shall at least comprise the following information presented in such a way as to be comparable at Community level, in respect of each forest fire:

- (a) date and local time of first alert;
- (b) date and local time of first intervention;
- (c) date and local time of extinction;
- (d) location of the outbreak at the commune level (common code);
- (e) total fire-damaged area;
- (f) breakdown of the fire-damaged area into forest and other wooded land and non forested areas;
- (g) presumed cause.

2. The technical specifications set out in Annex II shall be used for the purpose of recording the common core data referred to in paragraph 1.

*Article 10***Additional information**

For forest fires which affect areas of at least 50 hectares additional information may be provided annually by the Member States to the Commission in addition to the common core data referred to in Article 9.

Such additional information shall, if provided, include the level of damage, that is to say, whether low, medium or high, and the location.

CHAPTER IV

STUDIES, EXPERIMENTS AND DEMONSTRATION PROJECTS

(Article 5(2), 6(2) and 7(2) of Regulation (EC) No 2152/2003)

*Article 11***Evaluation of project proposals**

The proposals for studies, experiments and demonstration projects and testing on the basis of a pilot phase submitted by the Member States pursuant to Articles 5(2), 6(2) and 7(2) of Regulation (EC) No 2152/2003, hereinafter referred to as 'project proposals', shall be evaluated by the Commission on the basis of the criteria established in Annex III.

*Article 12***Decision concerning the ranking for project proposals**

The Commission shall establish a ranking of priorities for granting Community support of the project proposals.

CHAPTER V

COMPETENT BODIES

(Article 14 of Regulation (EC) No 2152/2003)

*Article 13***Competent bodies**

1. The competent body to be designated by each Member State pursuant to Article 14 of Regulation (EC) No 2152/2003, hereinafter referred to as 'competent bodies', shall be the contact point for the Commission.

2. Belgium, Germany and Portugal may designate more than one competent body.

*Article 14***Selection Criteria**

1. The competent bodies shall comply with the rules laid down in Regulation (EC, Euratom) No 1605/2002 and Regulation (EC, Euratom) No 2342/2002 as well as with the provisions laid down in the present Regulation.

2. The competent bodies shall meet at least the following criteria:

- (a) they shall be national public-sector bodies or private-law entities with a public-service mission, governed by the law of one of the Member States;
- (b) they shall offer adequate financial guarantees, issued by a public authority, in particular as regards full recovery of amounts due to the Commission;

(c) they shall operate according to the requirements of sound financial management;

(d) they shall ensure the transparency of the operations carried out in accordance with Article 56(1) of Regulation (EC, Euratom) No 1605/2002.

*Article 15***Additional conditions for private-law entities**

Where Member States pursuant to Article 14 designate private-law entities the Commission shall base its approval of those entities on the following proof provided by those entities:

- (a) their technical and professional capacity, on the basis of documentary evidence of the educational and professional qualifications of the members of their managerial staff;
- (b) their economic and financial capacity, on the basis of the state guarantee provided in accordance with Article 14(3)(e) of Regulation (EC) No 2152/2003 and appropriate statements from banks or evidence of relevant professional risk indemnity insurance, or balance sheets, or extracts from balance sheets, covering at least the last two years for which accounts have been closed, where publication of the balance sheet is required under the company law of the Member State in which the entity is established;
- (c) their competence under national law to perform the budget-implementation tasks, as attested by documentary evidence such as their enrolment in a professional or trade register or a sworn declaration or certificate, membership of a specific organisation, express authorisation or entry in a register for value added tax (VAT);
- (d) that they are not in one of the situations listed in Articles 93 and 94 of Regulation (EC, Euratom) No 1605/2002;
- (e) that they agree to an audit by the Court of Auditors.

*Article 16***Agreement**

The Commission shall conclude an agreement with the competent bodies in conformity with Articles 56 of Regulation (EC, Euratom) No 1605/2002 and Articles 35 and 41 of Regulation (EC, Euratom) No 2342/2002.

*Article 17***Tasks of the competent bodies**

The competent bodies shall carry out the following tasks:

- (a) they shall conduct regular checks to ensure that the actions to be financed under Regulation (EC) No 2152/2003 have been implemented correctly;

- (b) they shall take appropriate measures to prevent irregularities and fraud and if necessary bring prosecutions to recover funds lost, wrongly paid or incorrectly used;
- (c) they shall provide the Commission with any information it requests;
- (d) they shall be the intermediary to whom the Community contribution is paid,
- (e) they shall hold the accounts and records of the receipt and payment of that contribution in support of the national programme, including all invoices and documents of a similar probative value to support the costs of the programme.

Article 18

Checks by the Commission

The Commission may carry out document and on-the-spot checks into the existence, the relevance and proper operation of the competent bodies, in accordance with the rules of sound financial management.

CHAPTER VI

NATIONAL PROGRAMMES AND ADAPTATIONS

SECTION 1

NATIONAL PROGRAMMES

(Article 7(2) and 8(1) and (2) of Regulation (EC) No 2152/2003)

Article 19

Content

1. The national programmes and the adaptations of those programmes in accordance with Article 8 of Regulation (EC) No 2152/2003 shall contain the information and supporting documents indicated in Annex IV.

Member States shall use the forms set out in that Annex for submitting, in paper and digital format, the national programmes and related adaptations to the Commission.

2. All activities provided for in Articles 4 and 5, Article 6(2) and (3) and Article 7(2) of Regulation (EC) No 2152/2003 for which a Community financial contribution is requested shall be included in the national programme as individual applications.

Article 20

Sub-programmes

The national programmes of Belgium, Germany and Portugal may consist of sub-programmes provided by the competent bodies.

SECTION 2

ADAPTATION

(Article 8(3) of Regulation (EC) No 2152/2003)

Article 21

Adaptation

1. Adaptations of the national programme shall only concern studies, experiments, demonstration projects as well as monitoring test phases in accordance with Articles 5(2), 6(2) and 7(2) of Regulation (EC) No 2152/2003.

2. Applications for the adaptation of the national programme shall be submitted to the Commission using the forms set out in Annex IV.

3. Applications for the adaptation of the national programmes for 2005-2006 shall be submitted to the Commission not later than 31 October 2005 to be taken into consideration for the following year.

CHAPTER VII

FINANCIAL MANAGEMENT AND MONITORING

SECTION 1

COSTS

Article 22

Definition of eligible costs

Eligible costs are costs that are directly and wholly attributable to the national programme approved by the Commission.

Member States may apply stricter national rules for determining eligible costs.

Article 23

Justification of expenditure

The expenditure shall be justified by adequate original documents, such as invoices, or documents of equal probative value.

The original documents shall not be annexed to the statement of expenditures. The competent body shall, however, if requested, provide the Commission with all details, including invoices, which it might need to assure the evaluation of the expenditure.

Article 24

Costs considered eligible

1. To be considered eligible, costs must have been provided for in the approved national programme, and be directly linked to, and necessary for, carrying out that programme.

2. The costs must be reasonable and comply with the principles of sound financial management, in particular value for money and cost-effectiveness.

3. The costs must have been actually incurred during the period of eligibility set out in the Commission decision approving the national programme. A cost is considered as incurred during the period of eligibility when:

- (a) the legal obligation to pay the cost has been contracted after the beginning of the period of eligibility and before the end of that period;
- (b) the execution of the activity to which the cost is related must have started after the beginning of the period of eligibility and must be completed before the end of that period.

4. The costs must have been fully paid before the submission of the final documentation together with the final statement of expenditure and income.

Article 25

Personnel costs

Personnel costs may be considered as eligible direct expenditure in respect of the actual time devoted to the national programme. They shall be calculated on the basis of the actual gross salary or wages plus obligatory social charges, but excluding any other cost.

The working time of each employee, including national civil servants and governmental agency employees working within the national programme, shall be registered using time sheets or reports from a time recording system established and certified by the competent body and its eventual partners.

Article 26

Travel costs

Travel costs may be considered eligible if they are directly and wholly attributable to the approved national programme. Travel costs shall be charged in accordance with the internal rules of the competent body.

Article 27

Overhead costs

1. Overhead costs which are intended to cover general indirect costs needed to employ, manage, accommodate and support directly or indirectly the personnel performing the work on the national programme or which relate to on-site infrastructure and equipment shall be eligible provided those costs are actual, justifiable and do not include costs assigned to another budget heading.

2. Overhead costs are eligible up to a maximum of 7 % of the total amount of eligible direct costs.

3. Overhead costs shall be charged to the national programme in accordance with the authorized cost accounting policy of the competent body.

Article 28

Capital costs

Where the costs include depreciation of capital investments with a life of more than one year and a price of more than EUR 500, these depreciation costs shall be considered eligible provided they relate exclusively to the national programme and the eligibility period of the concerned programme phase provided that: For investment in construction and infrastructure these costs are depreciated over 10 years using the straight line method, and for other equipment including informatics equipment 5 years straight line method.

Article 29

Costs for the purchase of second-hand equipment

The purchase costs of second-hand equipment shall be eligible under the following three conditions:

- (a) the seller of the equipment shall provide a declaration stating its origin, and confirm that at no point during the previous seven years has it been purchased with the aid of national or Community grants;
 - (b) the price of the equipment shall not exceed its market value and shall be less than the cost of similar new equipment;
- and
- (c) the equipment shall have the technical characteristics necessary for the operation and comply with applicable norms and standards.

Article 30

Subcontracting

Expenditure relating to subcontracts with intermediaries or consultants shall be based upon actual costs and shall be supported by the appropriate invoices and other supporting documents. Exceptionally, where the cost is defined as a percentage of the total costs of the operations, such cost may be considered eligible only if the competent body is able to justify it by reference to the actual value of the work or services provided.

Article 31

Value-added tax

Value added tax (VAT) shall be considered eligible when the competent body is not in a position to recover the VAT paid under the national programme.

The competent body shall provide a declaration from the relevant national authorities that VAT could not be recovered for the assets and services required for the measures carried out under the national programmes.

Article 32

Ineligible costs

1. The following shall not be regarded as eligible:
 - (a) any cost incurred for actions which benefit from aid under other Community financial instruments;
 - (b) exchange rate losses;
 - (c) unnecessary or wasteful outlays;
 - (d) distribution expenses and marketing and advertising expenses to promote products or commercial activities;
 - (e) any provisions for possible future losses or liabilities;
 - (f) any debtor interest and interest on borrowed capital;
 - (g) bad debts.

Certain of the costs referred to in point (d) may, however, be considered eligible as agreed with the Commission.

2. The non-eligible costs referred to in paragraph 1 shall not be considered by the Commission for the calculation of the total programme cost.

Article 33

Exchange rate

1. Conversion between the euro and the national currency shall be made using the daily euro rate published in the C series of the *Official Journal of the European Union*.
2. The rate to be used for conversion between the euro and national currencies shall be the exchange rate published on the last working day of the month preceding that in which the national programme, or as regards payments, the financial report and request for payment is signed and submitted to the Commission.

SECTION 2

PAYMENT

(Article 8(5) of Regulation (EC) No 2152/2003)

Article 34

Decision on financial contribution

The Commission shall decide on financial contributions to the eligible costs of the national programmes in two phases, one decision for each year of the programming period, hereinafter

referred to as the 'Commission decision'. The Commission decision shall be addressed to the Member State.

Article 35

Pre-financing

The competent bodies may ask for a pre-financing of 50 % of the annual Community assistance for the national programme as indicated in the national programme no sooner than three months after the date of notification of the Commission decision. The pre-financing shall be subjected to conclusion of an agreement pursuant to Article 16.

Article 36

Statements

1. The competent bodies shall submit to the Commission statements of the payments made under the national programme, using the models set out in Annex V. Those statements shall be accompanied by a statement concerning the progress of the activities undertaken under the national programme. The statements shall be submitted not later than 15 months after the date of notification of the Commission decision, and cover expenditure made in the previous year.

2. Eligible expenditures which comply with the provisions of Section 1 of this Chapter and is identified in the annual statement shall be offset by the Commission against the pre-financing to the Member States under the national programmes.

Where the statements exceed the related pre-financing the Commission shall make an interim payment.

In no circumstances may those interim payments exceed 30 % of the annual Community assistance for the national programme.

Article 37

Technical and financial implementation

1. Each of the two phases as referred to in Article 34 must have achieved full technical and financial implementation in accordance with the requirements of Regulation (EC) No 2152/2003 and of this Regulation not later than two years after the date of notification of the Commission decision.

The competent bodies shall make the request for payment of the balance of the eligible expenditure not later than 27 months after the date of notification of the Commission decision.

2. The balance for each phase shall be paid after the Commission has received a request for final payment for each phase and has checked the financial statement accompanying this request for payment.

Article 38

Coordination of requests for payment

In accordance with their national law Member States shall ensure that requests for payments by the competent bodies are coordinated and comply with the Commission decision.

Article 39

Applications for pre-financing and payments

The competent bodies shall submit applications to the Commission for pre-financing and for payments using the models set out in Annexes VI, VII, and VIII.

SECTION 3

IRREGULARITIES

(Article 14(3) of Regulation (EC) No 2152/2003)

Article 40

Irregularities

1. Any amounts lost through irregularities or negligence shall be recovered by the Member State and shall be reimbursed to the Community.

2. Where the Commission, within five years following the final payment of the balance of the final year of the national programme, notes any irregularity in an operation financed by the Community where the amount concerned has not been reimbursed to the Community under paragraph 1, it shall inform the Member State thereof and give it an opportunity to comment.

3. If analysis of the situation and any comments by the Member State concerned result in the Commission confirming the irregularity, the Member State shall reimburse the amounts concerned.

SECTION 4

CHECKS, AUDITS AND TECHNICAL VISITS

(Article 14(4) of Regulation (EC) No 2152/2003)

Article 41

Commission financial audit

1. The Commission, or any representative authorised by it, may audit the competent bodies, the contractors or sub-contractors responsible for the detailed implementation of the measures carried out under the national programme at any time during the contract and up to five years after the final payments of the Community contribution to the national programme.

2. The Commission or any authorised representative shall have access to documentation required to ascertain the eligibility of costs of the national programme participants such as invoices and pay roll extracts.

3. The audit shall be carried out on a confidential basis. The Commission shall take appropriate steps to ensure that its authorised representatives treat confidentially the data to which they have access or which have been provided to them.

The Commission may verify the use made by the competent bodies, the contractors or the sub-contractors responsible for the detailed implementation of the measures carried out under the national programme of the Community's financial contribution.

4. A report on the findings of the audit, pertaining to the competent bodies and other parties responsible for the implementation of the measures of the national programme, shall be sent to the competent bodies, the contractors and sub-contractors concerned. They may communicate their observations to the Commission within one month of receiving it. The Commission may decide not to take into account the observations conveyed after the deadline.

5. On the basis of the conclusions of the audit, the Commission shall take all appropriate measures it considers necessary, including the issuing of a recovery order regarding all or part of the payments made by it.

Article 42

Checks and technical visits

The competent bodies shall allow Commission staff and persons authorised by the Commission access to the sites or premises where the measures under a national programme are being carried out and to all documents relating to the technical and financial management of the operation. Access by persons authorised by the Commission may be subject to confidentiality arrangements to be agreed between the Commission and the competent body.

Checks may be initiated during the programming period and shall be carried out on a confidential basis.

The competent bodies and the parties responsible for the implementation of the measures carried out under the national programme shall provide appropriate assistance to the Commission or persons authorised by it.

Article 43

Evaluations

(Article 8(4) of Regulation (EC) No 2152/2003)

1. Member States shall carry out *ex-ante* evaluation, mid-term review and an *ex-post* evaluation of the national programmes in accordance with Annex IX.

2. The *ex-ante* evaluation shall include verification in detail of the relevance, feasibility and sustainability of the activities set out in the national programme as well as an examination of the results to be expected. The results of the *ex-ante* evaluation shall be transmitted to the Commission together with the national programmes.

3. The mid-term review and the *ex-post* evaluation shall include an assessment of the implementation status, the effectiveness and efficiency of the monitoring activities carried out within the framework of Regulation (EC) No 2152/2003. The results of the mid-term review shall be transmitted to the Commission before the 1 July 2006 and the results of the *ex-post* evaluation shall be transmitted to the Commission before 1 July 2007.

CHAPTER VIII

SCIENTIFIC ADVISORY GROUP

(Article 9(3) of Regulation (EC) No 2152/2003)

Article 44

Tasks

1. The Scientific Advisory Group to be established pursuant to Article 9(3) of Regulation (EC) No 2152/2003 shall advise the Standing Forestry Committee on the following subjects:

- (a) the need to carry out specific studies or analyses;
- (b) the need to set up ad hoc working groups for specific topics;
- (c) the improvement of the organisation and structure of the monitoring scheme;
- (d) science-policy interface;

2. The Scientific Advisory Group may give its opinion on:

- (a) proposals for studies,
- (b) results deriving from the studies such as relevance and data quality and, more generally, from the reports presenting the results from the monitoring scheme,
- (c) draft manuals.

3. The mandate of the Scientific Advisory Group shall be limited to the execution period of the scheme set out in Article 12(1) of Regulation (EC) No 2152/2003.

CHAPTER IX

ACCESS TO DATA

(Article 15(1) of Regulation (EC) No 2152/2003)

Article 45

Access to data

As far as necessary for the realisation of their actions on the basis of Article 9(5) and 11(2) of Regulation (EC) No 2152/2003, access to the data referred to in Articles 4(1) and 5(1) of that Regulation shall be granted to the European Environmental Agency and the International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests operating under the United Nations Economic Commission for Europe, (ICP Forests).

CHAPTER X

FINAL PROVISIONS

Article 46

Repeal

Regulation (EEC) No 1696/87 and Regulations (EC) No 804/94, (EC) No 1091/94, (EC) No 1727/1999 and (EC) No 2278/1999 are repealed.

Article 47

Entry into force

This Regulation shall enter into force on the third day following that of its publication in the *Official Journal of the European Union*.

This Regulation shall be binding in its entirety and directly applicable in all Member States.

Done at Brussels, 7 November 2006.

For the Commission
Stavros DIMAS
Member of the Commission

ANNEX I

Manual on parameters, monitoring methods and data formats for harmonised monitoring of air pollution effects on forests

Structure of the Manual

This manual consists of the following 15 chapters:

Chapter 1	COMMON METHODS FOR THE SELECTION OF LEVEL II PLOTS
Chapter 2	COMMON METHODS FOR THE SURVEY OF THE CROWN CONDITION ON LEVEL I AND LEVEL II PLOTS
Chapter 3	COMMON METHODS FOR FOLIAR CHEMISTRY MEASUREMENTS ON LEVEL II PLOTS
Chapter 4	COMMON METHODS FOR MEASUREMENTS OF INCREMENT CHANGES ON LEVEL II PLOTS
Chapter 5	COMMON METHODS FOR DEPOSITION MEASUREMENTS ON THE LEVEL II PLOTS
Chapter 6	COMMON METHODS FOR MEASUREMENTS OF METEOROLOGY ON LEVEL II PLOTS
Chapter 7	COMMON METHODS FOR SOIL SOLUTION MONITORING ON LEVEL II PLOTS
Chapter 8	COMMON METHODS FOR GROUND VEGETATION ASSESSMENT ON LEVEL II PLOTS
Chapter 9	COMMON METHODS FOR LITTERFALL ASSESSMENT ON LEVEL II PLOTS
Chapter 10	COMMON METHODS FOR AMBIENT AIR QUALITY ASSESSMENT ON LEVEL II PLOTS
Chapter 11	COMMON METHODS FOR VISIBLE OZONE INJURY ASSESSMENT ON LEVEL II PLOTS
Chapter 12	COMMON METHODS FOR PHENOLOGICAL OBSERVATIONS ON LEVEL II PLOTS
Chapter 13	DETAILS FOR THE SUBMISSION OF BACKGROUND INFORMATION ON THE MONITORING METHODS APPLIED AND THE RESULTS OF EVALUATION/INTERPRETATION OBTAINED ON NATIONAL LEVEL
Chapter 14	COMMON INSTRUCTIONS FOR THE REPORTING OF THE RESULTS AND THE DATA FORMATS
Chapter 15	CODE LIST AND EXPLANATORY ITEMS FOR SURVEY DATA OF LEVEL I AND LEVEL II PLOTS

The specific provisions established by each chapter are based on technical recommendations of Expert Panels of the United Nations Economic Commission for Europe International Co-operative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests). A distinction is made between mandatory and optional monitoring activities (parameters, methods, etc.).

The chapters 1 to 8 and 14 to 15 build on the technical descriptions made in the Annexes of Commission Regulation (EC) No 1091/94 and in addition on sub-manuals concerning litterfall, ambient air quality, visible ozone injury and phenological assessments, which have not been covered by the above mentioned Regulation.

Chapter 2 provides for the technical details concerning the monitoring of crown condition on Level I points as well as on Level II plots as this is the only survey to be carried out regularly on both networks. Apart from this, only the two chapters on data submission and data formats (chapters 14 and 15) cover both Level I and Level II.

CHAPTER 1

COMMON METHODS FOR THE SELECTION OF LEVEL II PLOTS**I. Selection of Level II plots**

The selection of monitoring plots is under the responsibility of the Member States, although the following criteria for the selection shall apply:

- the minimum size of a plot shall be 0,25 hectares measured on a horizontal plane,

- to minimise the effects from activities on surrounding areas the plot shall be surrounded by a buffer zone. The actual width of this zone depends on the type and age of the forest. If the area of the plot and its surroundings is uniform with regard to height and age structure, the width of the buffer zone can be restricted to 5 or 10 m. If the forest area in which the plot is located consists of mixed stands, different species or age structure, the buffer zone shall be enlarged to up to five times the potential maximum height of the trees in the plot,
- the plots shall be easily accessible at all times and no restrictions with regard to the access and sampling should exist,
- there shall be no differences in the management of the plot, its buffer zone and the surrounding forest,
- disturbance caused by the monitoring shall be kept to a minimum,
- direct pollution from known local sources shall be avoided
- the plots shall be located sufficiently far away from the forest edge, up to five times the potential maximum height of the trees in the plot.

II. Installation and documentation of plots

Each installed plot shall be described in detail. General data concerning new or additional plots shall be determined and reported to the Commission in the framework of the next regular data submission. The detailed description of the plot shall include: the exact location of the plot (positioning of the centre and the corners of the plot), a sketch map showing the permanent marking of the plot corners and/or boundaries, the number of trees in the plot and any other relevant permanent identifiable elements in or nearby the plot (e. g. access road, rivers, ditches, large trees). The location of samplers and sample sites (e.g. deposition samplers or soil pits) shall be positioned (GPS or distance and direction from the centre of the plot) and recorded on this map as well.

III. Definition of a sub-plot

In principle all trees in the total plot are to be included in the sample for the tree assessments (e.g. crown inventory, increment assessment). In the case that the plot has many trees (i.e. dense stands), a sub-plot may be defined to be used for these surveys. The size of the sub-plot at the time of the installation of the plot should be large enough to give reliable estimates for these surveys for a minimum of 20 years, preferably throughout the life of the stand. A minimum of at least 20 trees in the sub-plot should be available in this period.

IV. General information on each plot

The following general information on each permanent observation plot for the intensive and continuous monitoring shall be collected during the installation of a new plot and the first surveys:

Installation	First surveys
— Descriptive code	Country Observation plot number Actual latitude and longitude
— Site data	Altitude Orientation Total plot size Number of trees in plot Subplot (if any) Availability of water to the principal species Humus type Soil unit (estimate)

Installation	First surveys
— Stand data	Mean age of dominant storey Main tree species Yield (estimate)
— Other observations	History of the plot Other monitoring stations situated nearby

Where additional plots are installed in order to complete the national intensive monitoring programme, the Member States shall forward to the European Commission for each installed plot the information collected during the installation using a data file and reports (by the end of the same year in which the installation took place).

All changes during the years concerning the monitoring set-up and other important information (e.g. forest operations, storms and pests incidents) shall be submitted yearly.

V. Replacement of destroyed plots and additional plots

Destroyed and additional plots should be selected among the existing Level I plots and following the selection criteria set out in this Chapter. The re-installed or additional plots shall be given a new number. Member States shall submit to the Commission, together with the next regular data submission, information on the reason for the plot replacement or the need for additional plots, the results of last observations/measurements made and the criteria applied for the selection of the new plots.

VI. Data transfer

Member States shall forward the information referred to in this Chapter to the Commission for each Level II plot using the formats established by forms 1 and 2 set out in Chapter 14.

CHAPTER 2

COMMON METHODS FOR THE SURVEY OF CROWN CONDITION ON LEVEL I POINTS AND LEVEL II PLOTS

I. General remarks

The survey of crown condition pursuant to Article 2 and Article 6(a) is mandatory and shall be carried out on all Level I points and Level II plots and shall be repeated annually. The following provisions are based on technical recommendations of Expert Panel on Crown Condition of the UNECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests).

II. Selection of sample trees

II.1. Selection of sample trees on Level I points

At each sampling point, sample trees shall be selected according to a stringently defined, objective and unbiased statistical procedure (e.g. four point cross cluster orientated along the main compass directions with corner points at 25 m distance from the grid point using a six-tree sampling process on each subplot or sample trees chosen following a spiral from the plot centre). In younger dense stands where individual crowns are not assessable, the selection of sample trees should be based on a defined geometrical process. This process shall be repeated until a sufficient number of trees with assessable crowns have been found. The following selection criteria are to be taken into account:

- Member States may decide on the number of trees to be assessed at each point; however, the sample shall not consist of less than 20 trees or more than 30 and the number shall remain constant,

- all tree species shall be included in the assessment. Sample trees should have a minimum height of 60 cm. Only predominant, dominant and co-dominant trees corresponding to the Kraft tree classes 1, 2, and 3 respectively, qualify as sample trees for the purpose of crown condition assessment. Trees of these social classes with broken tops cannot qualify as sample trees,
- trees removed as part of management operations, fallen trees (e.g. blown over by the wind or broken) and dead trees must be replaced by new sample trees selected according to an unbiased procedure. A tree is defined as dead if all conductive tissues in the stem have died. A dead tree must be recorded but only once. Clear-cutting of the stands imply that the sample point ceases to exist until a new stand has been established,
- the centre of a sampling unit must be marked for reassessment of subsequent inventories. Sample trees should be identifiable for the following year's assessment, if possible without permanent labeling.

II.2. *Selection of sample trees on Level II plots*

All pre-dominant, dominant and co-dominant trees corresponding to the Kraft tree classes 1, 2, and 3 respectively, in the total plot are to be monitored. In the case that the plot has many trees (e.g. dense stands), the number of sample trees for the crown assessment can be reduced by using a sub-plot. In the case of a sub-plot all the pre-dominant, dominant and co-dominant trees corresponding to the Kraft tree classes 1, 2, and 3 respectively, in the sub-plot are to be monitored. In certain cases it can be allowed that a different, but objective and unbiased system is used to reduce or to select the number of trees to be sampled. The same methods shall be applied every year and a minimum of 20 trees shall be assessed each survey.

III. **Date of assessment**

The inventory shall be undertaken between the end of the formation of new needles and leaves and before the autumnal leaf discoloration.

IV. **General background information**

The following plot and tree parameters must be assessed on Level I points:

- for each plot:
 - descriptive code,
 - country,
 - date of observation,
 - observation point number,
 - actual latitude and longitude coordinates,
 - availability of water to principal species,
 - humus type,
 - altitude,
 - orientation,
 - stand data,
 - mean age of dominant storey,
 - soil data,
 - soil unit,
 - additional plot information specific for the current year (operations, events),

- for each tree in the plot:
 - plot number,
 - sample tree data:
 - tree number,
 - tree species,
 - defoliation,
 - discoloration,
 - damage due to easily identifiable causes (insect, fungi, abiotic agents...),
 - identification of damage type,
 - observations on the tree in the plot.

The following plot and tree information must be collected on Level II plots:

- country,
- plot number,
- date of assessment
- number of trees
- tree species
- orientation,
- information on removals and mortality,
- exposure,
- social class,
- crown shading,
- visibility.

V. Assessment of sample trees

V.1. Visual assessment of defoliation

Defoliation shall be estimated annually in 5 % steps in relation to a tree with full foliage in local condition. The classification of trees into degrees of defoliation shall be carried out during the observation and shall be registered in 5 % steps.

A tree with a defoliation between 95 % and 100 %, which is still alive, is scored as 99. The score 100 is reserved for dead trees.

Class	Degree of defoliation	Percentage of needle/leaf loss
0	not defoliated	0 - 10
1	slightly defoliated	11 - 25
2	moderately defoliated	26 - 60
3	severely defoliated	61 - 99
4	Dead	100

V.2. Visual assessment of discoloration

The classification of trees into degrees of discoloration shall be carried out.

The degrees of discoloration shall be defined as follows:

Class	Discoloration	Indicative percentage of needles/leaves discolored
0	None or negligible	0 - 10
1	Slight	11 - 25
2	Moderate	26 - 60
3	Severe	> 60

If, in addition, defoliation and discoloration classes are combined, the following combined damage classes shall be used:

Defoliation class	Discoloration class		
	1	2	3
	Resulting damage class		
0	0	I	II
1	I	II	II
2	II	III	III
3	III	III	III
4	IV	IV	IV

0 = not damaged, I = slightly damaged, II = moderately damaged, III = severely damaged, IV = dead

VI. Assessment of damage causes

VI.1. Selection of sample trees

The assessment of damage causes is optional in order to complement the annual crown condition survey.

VI.2. Frequency and timing

Level I + Level II: assessment of damage causes shall be carried out during normal crown condition assessment in summer.

In Level II plots where the complete programme is carried out, the so-called 'key-plots', an additional visit for damage assessment shall be made if important damage is observed outside the period of crown condition assessment. The observations of the staff responsible for deposition sampling or phenological observations may act as an early warning system. This additional visit shall be made at the time when the main damage cause is supposed to be at its maximum (e.g. spring for defoliators).

VI.3. Parameters to be assessed

The following table sets out an overview of parameters in Level I points/Level II plots.

Symptom description	
	Specification of affected part
	Symptom
	Specification of symptom
	Location in crown
1.1. Cause	
1.2. Extent	

VII. Data transfer

Member States shall use forms 3-8 set out in Chapter 14 for the transmission to the Commission of the information for each plot

CHAPTER 3**COMMON METHODS FOR FOLIAR CHEMISTRY MEASUREMENTS ON LEVEL II PLOTS****I. General remarks**

The inventory of foliar chemistry in accordance with Article 6(a) shall be carried out on all Level II plots and shall be repeated on each individual plot in a two year interval. The following provisions are based on technical recommendations of Expert Panel on Foliar Chemistry of the UNECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests).

II. Inventory methodology**II.1. Date of sampling**

Deciduous species and larch: sampling shall be done when the new leaves are fully developed, and before the very beginning of the autumnal yellowing and senescence.

Evergreen species: sampling shall be done during the dormancy period. Member States are requested to define for each region, and inside each region for plains and mountains, the most convenient period for the sampling and analysis of the various species, and to keep to this period.

The foliage inventory shall be carried out for deciduous species and larch in summer 2005 and for evergreen species in winter 2005/2006. The inventory shall be repeated on each individual plot in a two years interval.

II.2. Selection of trees

Every second year, at least five trees of each main species present in the plot shall be sampled.

The numbers of trees needed for the sampling shall be selected in such a way that:

- the trees are different from those used for the crown assessment, in order to avoid that successive samplings introduce loss of foliage,
- in case the vitality assessment is restricted to the trees in the sub-plot, the trees for the foliage sampling shall be selected from the remaining part of the total plot. If no sub-plot is used the trees for sampling shall be selected from the trees in the buffer zone. In this case the trees selected for sampling in the buffer zone shall be given a special number,
- the trees belong to the predominant and dominant classes (forest with closed canopy) or to the trees with average height $\pm 20\%$ (forest with open canopy),
- the trees are in the vicinity of the locations where soil samples were taken for analysis; however care shall be taken that the main roots of the sample trees have not been damaged by soil sampling,
- the trees are representative of the mean defoliation level of the plot ($\pm 5\%$ of the mean foliage loss),
- the trees are representative of the sanitary status of the plot.

The same sample trees shall be sampled over the years; the trees shall be numbered. To avoid damage to the sample trees, it is allowed to alternate between two sets of five trees, when necessary. Each set shall respond to the above conditions.

Only trees of the main species shall be sampled (see Annex I, Chapter 15, item 16).

Trees which are used for the sampling of foliage shall be assessed on crown condition, using the existing or the specially assigned numbers.

II.3. *General information*

The following information shall be collected:

- plot number,
- data of sampling and analysis;
- tree species.

II.4. *Selection and quantity of leaves and needles*

The trees in the plot shall not be felled, which may influence the sampling method of leaves or needles. It is important that sampled leaves or needles have developed in full light.

The sampled leaves or needles shall be taken from the upper third of crown, but not from the very first whorls in the conifers;

For deciduous species, sampling shall be done on current year leaves or needles.

For evergreen species, sampling shall be done of both the current year needles or leaves and the second year needles or leaves (current + 1).

For all species it is necessary to take care that leaves or needles which are sampled are mature ones, especially for species which have several flushes per year (e.g. *Pinus Halepensis*, *Pseudotsuga menziesii*, *Eucalyptus* sp. *Quercus* sp.) For *Larix* sp. and *Cedrus* sp. samples are taken of the short twigs of the previous year.

In general, sampling shall be carried out in such a way that all the orientations are represented in the set of sample trees. If necessary it is allowed to sample different orientations on each tree of the sample set. In special sites with evident influence of one orientation (e.g. steep slopes or strong dominant wind) only one orientation is sampled, which always has to be the same. In such cases, it is necessary to document the orientation.

For the analysis of major elements and Fe, Mn, Zn, Cu, the recommended quantity is 30 grams of fresh needles or leaves for each sampled age class.

Each country may decide to sample a larger quantity of leaf material, according to the need of its own analytical methods, or in order to conserve samples for the future.

II.5. *Means of sampling*

As trees cannot be felled, any convenient way of sampling, taking into consideration kind and size of stands etc., is acceptable, provided that it does not lead to contamination of the sample, to heavy tree damage, or to risks for the sampling team.

II.6. *Pre-treatment before sending the samples to the laboratories for analysis*

At least five trees of each main species present in the plot are sampled; the five samples are individually preserved in bags; for analysis, a composite sample shall be made by mixing equal quantities of each of the five samples (in case the five trees are analysed individually, the mean value is calculated for each element).

Great care shall be taken to clearly mark each sample (forest, number of plot, species, age of needles, etc.) before sending it to the laboratory for analysis. These identifications shall be given outside the bag (directly on the bag by indelible ink, or by clasp a label on the bag).

II.7. *Treatment before analysis*

The determination of the mass of 100 leaves or 1 000 needles, as well as the shoot mass, shall be used for the intensive and continuous surveillance on the permanent observation plots and the current year shoot.

It is not necessary to cut the petioles of the leaves but in case of compound leaves it may be advisable to detach the small leaves from the axis if this has not been done in the forest. To avoid contamination, no powdered plastic gloves shall be used.

It is not necessary to systematically wash the samples, but it may be advisable in regions with a high level of air pollution or near the sea. The samples shall be washed with water without any additions.

Oven drying shall be done at no more than 80 °C for at least 24 hours. The needles shall be removed from the twigs with the same precautions as for detaching the small leaves from their axis.

II.8. Chemical analyses

Only the total element concentration is determined.

Each country is allowed to use its national methods. But it is necessary to certify the total element concentrations obtained by national methods with those certified on the reference standard samples. The foliage inventory will distinguish between mandatory and optional parameters (see list below)

Mandatory parameters	Optional parameters
Nitrogen (N)	Zinc (Zn)
Sulphur (S)	Manganese (Mn)
Phosphorus (P)	Iron (Fe)
Calcium (Ca)	Copper (Cu)
Magnesium (Mg)	Lead (Pb)
Potassium (K)	Boron (B)

III. Data transfer

Member States shall use formats established by forms 9, 10 and 11 set out in Chapter 14 for the transmission to the Commission of the information for each plot.

CHAPTER 4

COMMON METHODS FOR MEASUREMENTS OF INCREMENT CHANGES ON LEVEL II PLOTS

I. General remarks

The measurements of increment changes in accordance with Article 6(a) shall be carried out on all plots in the dormancy period. The reference for the first inventory under Regulation (EC) 2152/2003 shall be dormancy period of the winter 2004/2005 and shall be repeated in a five year interval.

The following provisions are based on technical recommendations of Expert Panel on Forest growth of the UN/ECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests). The measurement of the growth is divided into two parts:

- periodic measurements on tree parameters (mandatory all five years),
- tree ring analysis by means of increment cores and stem discs (optional).

The methodologies described here are inappropriate for maquis and similar vegetation types.

Member States are free to carry out, in addition to the periodic measurements on tree parameters, permanent continuous girth band measurements.

II. Inventory methodology

II.1. Date of measurements

Measurements shall be done during the dormancy period.

II.2. Selection of sample trees

In principle all trees in the total plot shall be monitored. In the case that the plot has many trees (e.g. dense stands), a sub-plot may have been defined to be used for the tree assessment. In this case the trees in the sub-plot shall be monitored. The size of the sub-plot at the time of the inventory should be large enough to give reliable estimates for stand increment over the entire measurement period. The exact size of this sub-plot shall be determined and reported.

All trees with at least 5 cm diameter over bark shall be individually identifiable by numbering.

II.3. General information

The following information shall be collected:

- plot number,
- data of sampling and analysis,
- tree number.

II.4. Parameters to be measured

	Mandatory parameters	Optional parameters
Periodic measurements	Tree species Diameter at breast height (DBH) Tree height Height to crown base on a sub-sample of trees in the plot Information on management operations	Bark Tree height (on all trees) Crown height (on all trees) Crown width Volume estimates
Tree ring analysis		Ring width History of the tree diameter under bark in five years intervals Basal area and volume estimates

III. Data transfer

Member States shall use forms 12 to 16 set out in Chapter 14 for the transmission to the Commission of the information for each plot

CHAPTER 5

COMMON METHODS FOR DEPOSITION MEASUREMENTS ON LEVEL II PLOTS

I. General remarks

The measurements of deposition in accordance with Article 6(b) shall be carried out on at least 10 % of the Level II plots.

The following provisions are based on technical recommendations of Expert Panel on Deposition of the UNECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests).

II. Monitoring methodology

Each deposition plot shall be described in detail. Some of the information is already included in the descriptions of the forest monitoring plots (longitude, latitude, altitude, exposure, tree species, etc.). Other information needs to be documented with special consideration to the deposition situation (exposition to local emission sources and local land use, location in relation to forest edges etc.). For interpretation and understanding of the deposition processes, information on factors such as canopy roughness, leaf area index, etc. is valuable.

II.1. *Monitoring throughfall*

Deposition monitoring shall be site specific. Measurements shall be made in such a way that they are spatially well distributed over the country, if necessary on all Level II plots. Throughfall deposition measurements shall be made on the plot itself. If this is not possible, the measurements shall be made close to the plot and in the same stand. The measurements shall in no way interfere with other measurements of soil and vegetation. Caution shall be taken not to cause any damage to the forest plot.

II.2. *Monitoring in an open area in the forest*

At a location near the actual plot (within a distance of 2 km), wet-only and/or bulk deposition collectors shall be installed. The location shall be selected in such a way that the surrounding objects are not closer than two times their height.

II.3. *Monitoring air pollution*

Air pollution measurements shall be site specific, but could for practical reasons, or for reasons of co-ordination with other projects, be made at some distance. The measurement site shall not be influenced by local emission sources.

II.4. *Measurement period*

The measuring will be made 4-weekly, weekly or at a time interval between the two depending mainly on the general weather conditions at the specific plot.

When it is necessary to use different measuring periods during the year (e. g. weekly in summer and monthly in winter), two separate monitoring periods shall be identified and the results shall be reported separately. Within one monitoring period the length of the measuring period shall be constant. The same measuring period shall be used for the monitoring under the forest canopy and the open area monitoring.

II.5. *Sampling, sample handling*

Clean collection gauges and containers shall be used for the collection of samples. Deionized water shall be used to rinse the equipment. It is important that the containers are kept away from light and kept cool during the sampling and transport. In sunny and warm conditions preservatives may be added to prevent the growth of algae. In this case only such preservatives should be used that do not interfere with the analysis of any ion of interest.

II.6. *Pre-treatment of samples, transport and storage*

The volume of each collected sample from each individual throughfall, stemflow or open air collector shall be determined. The samples may be analysed separately or pooled with samples collected from the same plot in the same time interval. Throughfall, stemflow or open air samples shall be analysed separately. Samples from stemflow measurements can only be pooled for trees of the same species and similar size and dominance.

Samples from short periods may be analysed as they are, or can be mixed to monthly samples before analysis. If samples are mixed they should be mixed in proportion to the total sample volume.

The samples shall be transported to the laboratory as soon as possible (preferably in cold boxes) and kept in a cold (4 °C) and dark store until analysed.

II.7. *General information*

The following information shall be collected:

- plot number,
- sampler code,

- first date of monitoring period,
- last date of monitoring period,
- number of (equal) measuring periods in monitoring period.

Additional optional information may be collected, where it is useful for the interpretation of the results, such as canopy roughness, leaf area index etc.

II.8. Chemical analysis

Mandatory and optional parameters to be analysed on bulk deposition, throughfall, stemflow and fog samples are provided for in the following table:

Sample type	Mandatory	Optional
Bulk deposition, throughfall, stemflow	Amount of precipitation	
	pH and conductivity at 25 °C	
	Na, K, Mg, Ca, NH ₄	Al, Mn, Fe, and other heavy metals, e.g. Cu, Zn, Hg, Pb, Cd, Co, Mo
	Cl, NO ₃ , SO ₄	P total, PO ₄
	Total alkalinity	
	Mandatory for individual samples if pH > 5	
	DOC, Ntotal (N total is not mandatory for bulk deposition, but is highly recommended)	S total, HCO ₃ HCO ₃ can either be obtained by calculation (from pH, total alkalinity, temperature and ionic strength) or by direct measurement
Fog, frozen fog (rime)		pH, conductivity
		Na, K, Mg, Ca, NH ₄
		Cl, NO ₃ , SO ₄ , P total
		Alkalinity
		Al, Mn, Fe, and other heavy metals, e.g. Cu, Zn, Hg, Pb, Cd, Co, Mo

DOC = dissolved organic carbon, and N total = total nitrogen.

III. Data transfer

Member States shall use forms 17 to 19 set out in Chapter 14 for the transmission to the Commission of the information for each plot.

CHAPTER 6

COMMON METHODS FOR MEASUREMENTS OF METEOROLOGY ON LEVEL II PLOTS

I. General remarks

The measurements of meteorology in accordance with Article 6(b) shall be carried out on at least 10 % of the observation plots. The following provisions are based on technical recommendations of Expert Panel on Meteorology and Phenology of the UNECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests).

II. Inventory methodology

II.1. Location of sampling equipment

To represent the specific climatic conditions of woodlands the measurements shall be carried out inside the forest area concerned. In general the measurements (with the exception of soil temperatures, soil moisture and stand precipitation) may be taken either above the forest stand canopy at the plot or at an open field station within the forest area in close proximity (in general not more than 2 km distance) to the stand of the plot. The distance from the measuring point at open field stations to the surrounding stands or other obstacles shall be at least two times the height of a mature tree obstacle. Soil temperature, soil moisture and stand precipitation shall be measured inside the stand of the permanent observation plot.

Whenever possible a combination with the equipment for deposition shall be made. To avoid disturbances to the roots and soil situation, the equipment shall be placed so that it can be reached and maintained without actually passing through the plot.

II.2. Methods to measure the actual meteorological situation in or close to the plot

By installation of a meteorological station in an open area close to the plot or the installation of a tower in the stand near the plot, the weather situation shall be monitored continuously. The technical equipment, sensors and their placement are to be in accordance with the international meteorological standards. The following variables are to be obtained.

Mandatory	Optional
Precipitation	UVB radiation
Air temperature	Soil temperatures
Air humidity	Soil moisture
Wind speed	(matric potential, water content)
Wind direction	Stand precipitation (quantity of through fall and stem flow)
Solar radiation	

II.3. Collection, aggregation, storage and submission of information

Data shall be aggregated to daily values (sum or average/mean, minimum and maximum respectively) before submission.

The following plot information shall be collected and submitted:

- country,
- plot number,
- exact details of the used equipment,
- location of the plots (longitude, latitude, altitude) and of equipment (relative to the plot),
- start and end dates of the measurements,
- Frequency (number of periods).

LIST OF PARAMETERS

Parameter	Units	Mean	Sum	Minimum	Maximum	Remarks
Precipitation	(mm)		(*)			Total precipitation (Including snow, etc.)
Air temperature	(°C)	(*)		(*)	(*)	
Relative humidity	(%)					
Wind speed	(m/s)	(*)			(*)	
Wind direction	(°)	(*)				Prevailing wind direction
Solar radiation	(W/m ²)	(*)				
UVB radiation	(W/m ²)	(*)				
Soil temperature	(°C)	(*)		(*)	(*)	
Soil moisture: Matric potential in soil	(hPa)					
Soil moisture: Water content in soil	(Vol %)	(*)		(*)	(*)	
Stand precipitation (through fall and stem flow)	(mm)		(*)			
Others						To be specified in the data accompanying Report

(*) = To be submitted.

III. Data transfer

Member States shall use the formats established by forms 20 to 23 set out in Chapter 14 for the transmission to the Commission of the information for each plot.

CHAPTER 7

COMMON METHODS FOR SOIL SOLUTION MONITORING ON LEVEL II PLOTS

I. General remarks

Monitoring of soil solution in accordance with Article 6(b) shall be carried out on at least 10 % of Level II plots.

The following provisions are based on technical recommendations of the Soil Expert Panel of the UNECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests).

II. Inventory methodology

II.1. Selection of sampler location

Soil solution samplers shall be installed close to where crown condition assessment is conducted. Lysimeters may be distributed randomly or systematically over the whole plot although this may be limited by the presence of stones or stems (distance from a tree is not specified). Because of disturbances to the soil, zero-tension lysimeters shall not be installed in the central part of the plot where tree parameters are monitored. For practical reasons, a representative subplot can be used. Lysimeters that have already been installed may be maintained, but new installations shall be made as proposed above.

II.2. *Sampling depths*

Lysimeters shall be installed at fixed depths but installation by horizons is also acceptable.

— Soil solution collectors

Where appropriate lysimeters shall be placed at least two depths, i.e. one within the rooting zone (suggested depth is 10 to 20 cm) to gain insight into concentrations of nutrients and toxic elements near the fine roots (aim 1) and one below the rooting zone (suggested depth is 40- 80 cm), to estimate the element output (aim 2). A third lysimeter may also be placed immediately below the humus layer.

II.3. *Sampling frequency*

On plots where other intensive monitoring programmes are carried out, e.g. deposition and meteorological measurements, the sampling of the soil solution shall be done monthly or bi-weekly. Sampling shall be done at the same month of the year.

II.4. *Transport, storage and preparation*

The samples shall be transported and stored in such a way that chemical changes are minimized.

Cool (4 °C) and dark storage of the soil solution within the lysimeter system will diminish biological activity. In many cases, and especially during colder season, keeping the bottle dark is sufficient. Organic or inorganic preservatives may be used, but they may interfere with the analysis. To diminish possible changes in the samples, the soil solution should be collected as soon as possible after the suction has been applied.

Transport and storage procedures (including waiting periods) shall be reported. Where applicable the problems and deviations of these procedures shall be reported in detail.

For determination of trace metals, aliquots of the sample shall be transported to the laboratory in acid washed bottles.

If soil samples are collected, they shall be kept cool in plastic or polyethylene bags and stored at 4 °C until centrifugation or the preparation of the saturation extract. Centrifugation or extraction shall take place within one day (18 - 30 hours) after collection of the soil samples.

II.5. *General background information*

The following information shall be collected:

- country,
- plot number,
- information on sampler (type, depth),
- first date of monitoring period,
- last date of monitoring period,
- number of (equal) measuring periods in monitoring period.

II.6. *Analysis methods*

The inventory of the forest soil solution monitoring distinguishes between mandatory and optional parameters (See list below).

LIST OF PARAMETERS

Parameter	Unit	Mandatory/Optional
Conductivity	µS/cm	Opt.
pH		Man
Alkalinity	µmolc/l	Opt (if pH > 5)
DOC	mg/l	Man
Sodium (Na)	mg/l	Opt ⁽¹⁾
Potassium (K)	mg/l	Man
Calcium (Ca)	mg/l	Man
Magnesium (Mg)	mg/l	Man
Aluminium (total)	mg/l	Man (if pH < 5)
Aluminium (labile)	mg/l	Opt
Iron (Fe)	mg/l	Opt
Manganese (Mn)	mg/l	Opt.
Total Phosphorus (P)	mg/l	Opt
NO ₃ -N	mg/l	Man
SO ₄ -S	mg/l	Man
NH ₄ -N	mg/l	Opt ⁽²⁾
Chlorine (Cl)	mg/l	Opt ⁽¹⁾
Chromium (Cr)	µg/l	Opt
Nickel (Ni)	µg/l	Opt
Zinc (Zn)	µg/l	Opt ⁽³⁾
Copper (Cu)	µg/l	Opt ⁽³⁾
Lead (Pb)	µg/l	Opt
Cadmium (Cd)	µg/l	Opt
Silicon (Si)	mg/l	Opt

Man. = Mandatory Opt. = Optional

⁽¹⁾ Measurement is advisable when acid base budgets are calculated.

⁽²⁾ Measurement of NH₄ is advised in areas with high NH_x deposition (above 20 kg NH_x per ha per year).

⁽³⁾ Advised since these are minor nutrients. Member States are free to analyse more, all, or part of the optional parameters.

III. Data transfer

Member States shall use the formats established by forms 24, 25 and 26 set out in Chapter 14 for the transmission to the Commission of information for each plot.

CHAPTER 8

COMMON METHODS FOR GROUND VEGETATION ASSESSMENT ON LEVEL II PLOTS

I. General remarks

The inventory of ground vegetation in accordance with Article 6(b) shall be carried out on at least 10 % of the Level II plots.

The following provisions are based on technical recommendations of Expert Panel on Ground Vegetation condition of the UNECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests).

II. **Inventory methodology**

II.1. *Sampling design*

Two different sampling designs may be used, which either lead to a more qualitative or to a more quantitative characterization:

- in the first case, the dynamics are assessed by monitoring changes in the species composition over a large area, utilizing sampling units greater than 100 m², with a low to medium accuracy in estimates of changes in cover for each of these species,
- in the second case, the study concentrates on population dynamics (expansion or regression) on a smaller area. Small sampling units (in general fewer than 10 m²) are used for a more accurate estimation of species cover.

The area selected for vegetation assessment shall be representative for the plot, in order to allow the comparison with other parameters recorded on the same plot. Several sampling units shall be used in order to obtain statistical replication.

According to phytosociological usage, the minimal requirement is to map the species at the plot level. In order to achieve comparability of results between countries, a common sampling area (CSA) of 400 m², representative for the ground vegetation of the Level II plot, is mandatory. This area can be reached as the sum of smaller sub-plots within the Level II plot area. Data shall be submitted for the total CSA area, not per sub plot (aggregated data). Member States shall keep the results of separate sub-plots in their national databases.

Countries are free to select the number and shape of the sampling units.

If sampling units are not contiguous, they shall be placed as far apart as possible within the Level II plot or in its buffer zone in order to minimize spatial correlation between the sampling units within a plot. They shall also exclude major heterogeneities at any scale of sampling (boulders and cliffs, tracks and paths, fire places, streams and ponds, ditches and channels, peaty pools).

A permanent marking system has to be installed for the sampling units.

II.2. *General information*

The following general information shall be collected:

- country
- plot number
- date of sampling and analysis
- fencing
- total area sampled
- information on the total ground vegetation layer (cover), the shrub and herbs layer (cover and average height) and the moss layer (cover).

II.3. *Measurement of species abundance or cover*

Member States are free to apply in the assessment their own scaling system as long as it can be directly converted into percentage cover ranking from 0,01 % (very rare) to 100 % (complete cover).

II.4. *Species*

All phanerogams, vascular cryptogams, terricolous bryophytes and lichens shall be taken into account. The list of species shall be complete for these groups. Non-terricolous species and fungi can be noted additionally, but should ideally be the subject of separate surveys. Unidentified species should be noted as such, and, if not rare within the sampling units, should be sampled and stored in a herbarium for subsequent identification.

Species only encountered in special places (e.g. rocks, tree stumps, tracks and paths, dead wood, etc.) should be noted separately.

II.5. *Frequency and assessment time*

Every five years, vegetation studies shall be undertaken on at least 10 % of the plots. In the case of a seasonally complex vegetation composition, a second assessment during the year may be needed to assess the full vegetation cover. The subsequent ground vegetation assessments shall be carried out around the same date of the year.

II.6. *Analysis*

The assessed information on sampling units shall be aggregated to plot level.

III. **Data transfer**

Member States shall use the formats established by forms 27 and 28 set out in Chapter 14 for the transmission to the Commission of the results of the ground vegetation assessment.

CHAPTER 9

COMMON METHODS FOR LITTERFALL ASSESSMENT ON LEVEL II PLOTS

I. **General remarks**

Monitoring of litterfall in accordance with Article 6(c) shall be carried out on optional basis on Level II plots from the year 2005 onwards. Where litterfall monitoring is carried out the following provisions shall be applicable.

The following provisions are based on technical recommendations of the ad hoc Working group on Litterfall of the UNECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests).

II. **Inventory methodology**

II.1. *Sampling*

For all aims of litterfall assessment it is suggested that the sampling design of plots represents a wide range of soils, climates and stand structure of a given species.

Litterfall assessment shall be carried only on Level II monitoring plots where intensive monitoring of meteorology, deposition, soil water, and phenology are also performed.

II.2. *Siting and number of litterfall traps*

Litterfall traps shall be set up in a design enabling comparisons with deposition and soil water results. The traps are fixed and may be placed randomly or systematically e.g. at regular intervals and in a sufficient number to represent the whole plot and not only the dominant tree species

Litterfall traps should be distributed all over the plot area. Litterfall shall be sampled from at least 10 collectors per plot and even up to 20 collectors depending on plot size and tree species involved in the assessment.

The countries are free to select the type of traps for the monitoring of litterfall.

II.3. *Frequency of sampling*

Litterfall shall be collected at least monthly and even bi-weekly in periods of heavy litterfall. The samples may be pooled to periodic samples for chemical analyses. In regions with snow and frost in wintertime and in remote areas it may be necessary to let the traps stay over winter in the forest. Litterfall may then be collected once before the winter period and once after snowmelt, as frost limits drainage and litter decomposition.

II.4. *Parameters and analysis*

Litterfall assessment distinguishes between mandatory and optional parameters (See list below).

LIST OF PARAMETERS

Mandatory	Optional
Ca, K, Mg, C, N, P, S	Na, Zn, Mn, Fe, Cu, Pb, Al, B

For chemical analysis the litterfall samples are dried to constant weight in an oven at maximum 80 °C, preferably at 65 °C. After this drying, the mass of 100 leaves or 1 000 needles is determined at 105 °C. Knowing the percentage of moisture in the sub samples, the whole amount of each fraction can be converted to dried mass at 80 °C. The samples dried at max 80 °C are grounded to a homogeneous powder. The chemical analysis of litter is similar to the foliar chemical analysis. The results of litterfall chemical analysis are reported to 80 °C just like the litterfall mass.

III. Data transfer

Member States shall use the formats established by forms 29, 30 and 31 set out in Chapter 14 for the transmission to the Commission of the information for each plot

CHAPTER 10

COMMON METHODS FOR AMBIENT AIR QUALITY ASSESSMENT ON LEVEL II PLOTS**I. General remarks**

Assessment of ambient air quality is to be carried out on an optional basis on Level II plots. Where ambient air quality is assessed the following provisions shall be applicable.

The following provisions are based on technical recommendations of the Working Group on Ambient Air Quality of the UN/ECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests).

II. Choice of method and Equipment

Passive sampling shall be applied on sites that do not currently monitor main air pollutants using active samplers.

Individual countries are free to select the type of passive sampling device that is used. However, it has to be shown that both the samplers and procedure that are used, comply with measurements made using a reference method (active sampler).

III. Measurement period

Sampling shall preferably be carried out at least on a 2-weekly basis. At remote sites, the measurement period can be extended to four weeks if necessary, and at highly polluted sites, shortened to one week. Measurements of ozone shall be limited to the leafed period for deciduous species, but shall be continued for the rest of the year for other pollutants.

IV. Selection of plots and location

Ambient air quality monitoring shall be site specific and shall be carried out on plots where meteorology and deposition data are available. Sites with variable exposure should be chosen i.e. sites where high exposure is expected in addition to a few background stations.

Air pollution concentrations shall be measured near, but outside the forest, in a place representative of the plot. Monitoring can be carried out in an open field, preferably where the samplers for wet deposition and the meteorological equipment are installed.

V. Parameters

The following parameters are part of the optional ambient air quality monitoring.

Compounds	Parameters	Comment
Gaseous compounds	O ₃ , SO ₂ , NO ₂ , NO, HNO ₃ , HNO ₂ , NH ₃ , VOC	With regard to direct effect on vegetation, ozone is in most areas in Europe the most important pollutant.
Particulate compounds	SO ₄ ²⁻ , NO ₃ ⁻ , NH ₄ ⁺ , base cations	For calculating the dry deposition of particulate compounds, measurements should preferably be made with consideration to particle size distribution.

	O ₃	NH ₃	NO ₂	SO ₂
mean concentration	X	X	X	X
max (*). concentration	X	X	X	X
AOT 40 (*)	X			

(*) Only when active sampling.

VI. Data transfer

Member States shall use formats established by forms 32, 33 and 34 set out in Chapter 14 for the transmission to the Commission of the information for each plot.

CHAPTER 11**COMMON METHODS FOR VISIBLE OZONE INJURY ASSESSMENT ON LEVEL II PLOTS****I. General remarks**

Assessment of ozone injury in accordance with Article 6(c) shall be carried out on an optional basis on Level II plots. Where ozone injury is assessed the following provisions shall be applicable.

The following provisions are based on technical recommendations of the Working Group on Ambient Air Quality of the UNECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests). [Reference is made to the sub-manual prepared by this Working Group where additional information is made available.]

II. Scope

The assessment of the symptoms of visible ozone injury shall be conducted preferably on the plots where the passive ozone sampling is carried out.

III. Assessment and Evaluation**III.1. Assessment within the Level II plots**

The assessment for visible ozone injury on main tree species within the Intensive Monitoring Plot (IMP) shall be conducted at least on the branches from the same 5 individual trees where foliar sampling for chemical analysis is carried out.

The samples for foliar injury should be collected every second year from the upper sun exposed crown.

An annual assessment is preferred but optional.

III.2. *Assessment within the Light Exposed Sampling Site (LESS)*

A Light Exposed Sampling Site (hereinafter referred to as LESS) shall be established within the vicinity of the location where the ozone passive sampler is installed. The aim of the assessment within the LESS is to provide estimates of ozone foliar injury on the vegetation at the light exposed forest edge closest to the ozone measurement device within a maximum radius of 500 m. The suggested sampling scheme is a random sampling design as described in Appendix I of the sub-manual prepared by the Working Group where additional information is made available.

The assessment is done on trees, shrubs, vines and perennial herbs (annual herbs are optional);

Only monocots are excluded from the assessment.

III.3. *Evaluation period*

Identification and quantification of visible ozone injury within Level II plot shall be carried out during: for conifers between October and February, and for broadleaves between July and beginning of September.

In general, identification of visible ozone injury on trees, shrubs and herbs within the LESS and for the ground vegetation within the IMP (optional) shall be carried out at least once during late summer (and in early summer if feasible) before natural leaf discoloration sets in and senescence and/or drought leads to leaf loss.

III.4. *Evaluation for the main broadleaf tree species*

For the main tree species, five branches (as small as possible, but with all leaf age stages present) from each tree shall be pruned from the sun exposed portion of the upper third of the crown, simultaneously with the biannual foliar sampling for the chemical analysis of needles and leaves or according to the local symptoms phenology if possible. Once collected, a representative number of leaves per branch (i.e. approximately 30 leaves in the case of *Fagus sylvatica*) shall be examined under best light conditions and scored for occurrence of ozone-injury (yes/no).

Score	Percentage, definition
0	No injury, none of the leaves injured.
1	1 %-5 % of the leaves show ozone symptoms
2	6 %-50 % of the leaves show ozone symptoms
3	51 %-100 % of leaves show ozone symptoms

III.5. *Evaluation for the conifer main tree species*

Following the leaf-sampling procedure, from each tree several branches (5 branches as small as possible but having at least the current year's needles (C-needles) and previous year's needles (C+1-needles)) shall be pruned from the sun-exposed portion of the upper part of the crown. If this part of the tree is not accessible, use part of the branches collected for foliar analysis.

The chlorotic mottling will be scored for each needle age class (from current year's (C) to 3-year old (C+2) needles) in percentage of total surface affected by locating all needles of one age class forming a surface, and then the corresponding score (classes) for that percentage will be assigned, according to the following table.

Score	Definition
0	No injury present.
1	1-5 % of the surface is affected
2	6- 50 % of the surface is affected
3	51 – 100 % of the surface is affected.

The scores shall be produced per needle class; thus trees (and species) will have separate scores for the needles of age-classes C, C+1, C+2, etc. The final score of an individual tree shall be the score corresponding to the average injury percentage of a given needle year-class for that tree (this is obtained by averaging the injury percentages of all individual needle-whorls of a given age-class on that tree); similarly, the final score for the plot shall be the score corresponding to the average of the injury percentages of all sampled trees.

III.6. *Identification of visible ozone on (small) tree, shrub, and perennial species within the LESS and (optional) the ground vegetation within the Level II plot*

For the symptom assessment of small tree, shrub, and herbs species within the LESS and the ground vegetation (optional) within the Level II plot the following information is required for each of the randomly selected sampling spatial unit:

- The scientific name and code of the present (small) tree, shrub, and herbs species with the indication whether they show symptoms or not.
- Trees and shrubs shall be assessed singularly, vines and herbs as populations;
- Estimates are therefore resulting in terms of frequency, means and totals:
 - frequency of quadrates including symptomatic plants (% of forest edge vegetation area affected),
 - frequency of symptomatic species (% of symptomatic species over the total number of species of the forest edge),
 - mean number of symptomatic species,
 - total number of symptomatic species,
 - estimates should be reported with confidence intervals at a 95 % probability level.

Soil moisture conditions shall be recorded within the LESS and the optional subplots. Samples and pictures of each injured are to taken of species in accordance with the technical recommendations of the Working Group on Ambient Air Quality.

IV. **Data transfer**

Member States shall use forms 35, 36 and 37 set out in Chapter 14 for the transmission to the Commission of the information for each plot.

CHAPTER 12

COMMON METHODS FOR PHENOLOGICAL OBSERVATIONS ON LEVEL II PLOTS

I. **General remarks**

Assessment of phenology in accordance with Article 6(c) shall be carried out on an optional basis on Level II plots. Where phenology is assessed the following provisions shall apply.

The following provisions are based on technical recommendations of Expert Panel on Meteorology and Phenology of the UNECE International Cooperative Programme on Assessment and Monitoring of Air Pollution Effects on Forests (ICP Forests). [Reference is made to the sub-manual prepared by this Expert Panel where additional information is made available.]

II. **Scope**

A cursory examination on the plot and the buffer zone shall only be performed on those Level II plots where meteorological observations, deposition and litterfall measurement are being carried out.

III. **Observation and recording at the plot level**

Further background information on ecological processes on the plot, as well as an early warning system on events affecting the condition of the trees, could be obtained by recording the most obvious effects of biotic and abiotic (damaging) events and phenological phenomena. This is of special interest for the evaluation of Level II data at the national level.

The observations and recordings should be easy and simple, and limited to:

- Occurrence of flushing, color change and leaf/needle fall
- Biotic damage (pests and/or diseases)
- Abiotic damage (e.g. frost, wind, hail).

III.1. *Location*

The observations should be made on the plot and/or the buffer zone of all those Level II plots where continuous measurements are carried out.

III.2. *Frequency*

Observation dates may coincide with the collection of deposition samples or soil solution. A frequency of at least once every second week during the growing period is needed to follow the phenological changes.

III.3. *Observation and recording*

All species on the intensive monitoring plots are of interest; however priority should be given to the main tree species on the plot. Member States are free to include more species. In this case, however, each species should be recorded separately. Only events that have occurred and/or have changed their frequency/intensity since the last visit should be recorded. As the individual phases of phenological phenomena occur, assessments shall be repeated until the phase is completed.

IV. **Intensive phenological monitoring at the individual tree level**

The phases to be monitored (whenever applicable on the species) are: leaf/needle appearance, appearance of Lammas shoots, secondary flushing, flowering, autumn coloring, leaf/needle death and leaf/needle fall.

IV.1. *Selection of species and plots*

Priority should be given to:

- those plots where (at least) meteorological measurements are carried out,
- the most important species on the plot, which is already reported as the main species (other species on the same plot may be added).

IV.2. *Criteria for the selection of sample trees*

Criteria for selecting trees are:

Trees should be selected from those on which crown condition assessments are carried out. Preference should be given to trees that are clearly visible when standing outside the plot, because the high frequency of the observation may affect the condition of the ground vegetation on the plot.

If there is an insufficient number of crown condition trees visible, it will be necessary to select additional trees from the plot or from the buffer zone. In this case:

- trees should be dominant or co-dominant,
- trees on which periodical measurement of DBH and height is (planned to be) made should be preferred,
- trees selected for leaf/needle sampling and analysis are not to be included.

Between 10 and 20 trees per species on a plot are selected for the sampling. All trees should be numbered. If they already have numbers (e.g. for crown condition or increment assessment) these numbers shall be kept and used.

If a selected tree dies or is removed it can be replaced. The newly selected tree should be given a new number and it shall be registered and reported to the Commission.

IV.3. *Crown to be assessed*

Preferably the top of the crown (light crown) should be visible from one observation point. If this is not possible, then the middle part of the crown is also acceptable. The same part of the crown should be considered for subsequent phenological observations throughout the whole year, as well as for subsequent years.

IV.4. *Direction of assessment*

The direction from which the observations on individual trees are made should be the same every time. It should be recorded using an eight-class system at the time the trees are selected and reported on form 12a. Any change in this position should be recorded and reported as well.

IV.5. *Frequency of observations*

During the periods from the beginning to the end of the phenological phases in question, weekly observations shall be made on the same day of the week.

IV.6. *Phases to be monitored*

In principle, all phenological phases are of interest for phenological monitoring. However, from the practical point of view (e.g. financial input, ease and reliability of the monitoring, European-wide comparability, compatibility with other surveys like Crown Condition) it is necessary to concentrate on a limited set of phases and on the major species or groups of species.

A distinction is made between conifers and broad-leaved species:

Conifers	Broad-leaved species
Needle appearance	Leaf unfolding
Lammas shoots	Secondary flushing
Flowering	Flowering
	Autumn coloring
	Leaf death and leaf fall

For the flowering phase, only the beginning of opening of the male flowers (characterised by pollen shed) is to be recorded, whereas the other phases are to be recorded quantitatively. In addition, damage to needles, leaves or flowers caused by late frost in spring should also be recorded, as well as its intensity. The definitions and determinations of the individual phases are described hereafter.

V. **Additional monitoring techniques**

Additional techniques (such as litterfall collection or girth band measurements) can provide supporting and supplementary information.

Litterfall sampling provides quantitative data, e.g. about flowering, seed production, leaf/needle shedding etc.

Girth bands: Continuous measurement of changes in girth can provide information on the onset and cessation of growth and on the response of trees to stress phenomena.

Throughfall chemistry can provide additional information on the occurrence of phenological phases through changes in nutrient fluxes.

VI. **Data transfer**

Member States shall use forms 38, 39 and 40 set out in Chapter 14 for the transmission to the Commission of information for each plot.

CHAPTER 13

DETAILS FOR THE SUBMISSION OF BACKGROUND INFORMATION ON THE MONITORING METHODS APPLIED AND THE RESULTS OF EVALUATION/INTERPRETATION OBTAINED ON NATIONAL LEVEL**I. General remarks**

In addition to the submission of data in accordance with Article 15(1) of Regulation (EC) No 2152/2003, Member States shall prepare and submit to the Commission a document with the background information on the monitoring methods applied on Level I and Level II plots (Data Accompanying Report, DAR).

The DAR consists of two parts: the part describing the actually applied methods of the sampling layout, the equipment used, the assessment, the analysis, etc. (for details see paragraph II.1) and the part on exceptions and disturbances encountered (for details see paragraph II.2).

II. Data Accompanying Report**II.1. Part of the DAR describing the methods actually applied, etc.**

This part of the DAR describes the sampling layout methods actually applied, the equipment used, the assessment, the analysis, etc. The following details are given:

Inventory/Sampling methods

In many surveys of the Forest Focus scheme there is considerable freedom given to the selection of equipment, sampling depths, timing, intensity of the survey, etc. The details of the equipment actually applied the actual depth, timing and frequency of the survey/sampling shall be stated. Whenever samples have been taken, details on this sampling including the storage and transport shall be stated.

Any applied control measurements shall be described in short.

Methods for analysis and calculation of results

With regard to the analysis of samples, details of the preparation of the samples and methods applied in the analysis shall be given. Exact details on the used methods shall be given including possibilities for (re-) calculation of the obtained data. Any applied control measurements (participation in ring tests, etc.) shall be described in short.

The information submitted with the help of the DAR questionnaires will remain valid over the years until the applied methods are changed.

Special attention shall be given to observe and document changes in the applied methods of the inventory, transport and analysis. Regional differences shall be stated and explained in full detail (e.g. different laboratories used for analysis).

II.2. Part of the DAR dealing with exceptions and disturbances encountered (annual DAR)

In addition to the general information on the methods described by using the DAR questionnaire, the specific problems, exceptions, disturbances and validation problems of the data submitted each year, are to be described.

Exceptions and disturbances

Exceptional situations and important disturbances from the routine shall be reported. Besides the description of the applied methods for the sampling, analysis, etc., as presented in the DAR questionnaires, good documentation of the exceptions, exceptional situations and disturbances is needed. This will be documented in an annual DAR report and submitted to the Commission together with the submitted data.

Data validation, data management and data quality

The procedures applied for data checks shall be given, including limits of data rejection (plausibility checks) as well as the procedures that have been applied to check the consistency of the national data sets.

When gaps exist in the data, estimates based on results from other sources can be made in certain cases. These estimated data shall be indicated and the used assumptions shall be carefully documented.

Furthermore a description of the methods applied in view of the quality assurance and quality control has to be given.

The Commission may request further information from Member States if needed on the basis of annual DAR-Questionnaires.

CHAPTER 14

COMMON INSTRUCTIONS FOR THE REPORTING OF THE RESULTS AND THE DATA FORMATS

I. General technical information for the submission of data

I.1. Hardware requirements

As medium for the data submission, the 3,5" floppy disk (DSDD or HD) or CD-ROM has been selected. If the facilities for electronic data transfer are available such means should be used by Member States from 2005 onwards.

I.2. Software requirements, data format

The diskettes are to be formatted on the appropriate density (DSDD = low density and HD = high density), using DOS 2.1 or higher, and shall be 100 % IBM compatible. All information on the diskette or CD-ROM shall be in ASCII characters following the structure defined in tables as set-up under point V.

I.3. Data files

Each diskette (or set of diskettes) shall contain the plot and data files; the file with the summarized information of the plots (plot file), and file(s) with the inventoried results per survey (data files).

II. Data validation and data management

The procedures applied for data quality control shall be given, including limits of data rejection (plausibility checks) as well as the procedures that have been applied to check the consistency of the national data sets.

When gaps exist in the data, estimates based on results from other sources can be made in certain cases. These estimated data shall be indicated and the used assumptions shall be carefully documented.

III. Annual report on progress made in the interpretation/evaluation of results on national level

This report provides information on progress made in the interpretation/evaluation of results on national level. For the interpretation/evaluation of results on national level the following details are given:

Member States shall execute an evaluation and interpretation of the monitoring data on national level.

Member States are free to decide which evaluation and interpretation is carried out on national level and reported to the Commission.

IV. Timing for the submission of the DAR and the report on progress made in the interpretation/evaluation of results on national level

IV.1. Timing for the DAR

The DAR questionnaire shall be completed and submitted to the Commission with the first data submission. If the methods are changed the information on the changes shall be submitted. The part of the DAR dealing with descriptions of noted disturbances and exceptions shall be submitted to the Commission together with the annually submitted data.

IV.2. Timing for the report on progress made in the interpretation/evaluation of results on national level

Progress reports on evaluations and interpretations carried out on national level shall be forwarded to the Commission before 31 December each year.

V. Submission of data in a digital format - forms

Assessment/Information content	Form N°/Name		Network
Installation	1	XXGENER. PLT: Information on plot level	II
Installation	2	Other observations on the plots of the intensive monitoring of the forest ecosystems	II
Crown	3	XX1993.PLO: Information on plot level	I
Crown	4	XX1993.TRE NEW: Information on tree level	I
Crown	5	Contents of file with information on plot level to be used in combination with the tree vitality inventory on Level I	I
Crown	6	XX1996.PLT (TCP): Contents of file with the information on Plot level to be used with the crown assessment	II
Crown	7	XX1996.TRM (TC1): Contents of file with the information on Tree level (Mandatory) to be used with the tree condition assessment	II
Crown	8	XX2004.TRO: Contents of file with the information on Tree level (Optional) to be used with the tree condition assessment	II
Foliar	9	XX1996.PLF: Contents of reduced plot file to be used in combination with the survey of chemical content of needles and leaves	II
Foliar	10	XX1996.FOM: Contents of file with foliar analysis information (mandatory)	II
Foliar	11	XX1996.FOO: Contents of file with foliar analysis information (optional)	II
Increment	12	XX1993.PLI: Contents of reduced plot file to be used for increment	II
Increment	13	XX1996.IPM: Contents of file with increment information - periodic measurements	II
Increment	14	XX1996.IRA: Contents of file of increment information - ring analysis and stem disk analysis (optional)	II
Increment	15	XX1996.IEV: Contents of evaluated data on increment (optional)	II
Increment	16	XX2002.INV: Contents of reduced plot file to be used to report the plot volumes	II
Deposition	17	XX1996.PLD: Contents of reduced plot file to be used in combination with the deposition measurements	II
Deposition	18	XX1996.DEM: Contents of data file with deposition measurements (mandatory)	II
Deposition	19	XX1996.DEO: Contents of data file with deposition measurements (optional)	II
Meteorology	20	XX1996.PLM: Contents of reduced plot file to be used in combination with the meteorological measurements	II
Meteorology	21	XX1996.MEM: Contents of data file with meteorological measurements (mandatory)	II
Meteorology	22	XX1996.MEO: Contents of data file with meteorological measurements (optional)	II
Meteorology	23	XX1996.MEC: Contents of data file with climatic information (optional)	II
Soil solution	24	XX1996.PSS: Contents of reduced plot file to be used in combination with the soil solution measurements	II
Soil solution	25	XX1996.SSM: Contents of data file with soil solution measurements (mandatory)	II
Soil solution	26	XX1996.SSO: Contents of data file with soil solution measurements (optional)	II
Ground vegetation	27	XX1997.PLV: Contents of reduced plot file to be used in combination with the survey of ground vegetation	II
Ground vegetation	28	XX1996.VEM: Contents of data file with ground vegetation assessment	II
Litterfall	29	XX1996.LFP: Contents of reduced plot file to be used in combination with the survey on litterfall	II

Assessment/Information content	Form N°/Name		Network
Litterfall	30	XX2002.LFM: Contents of data file with litterfall analysis information (mandatory)	II
Litterfall	31	XX2002.LFO: Contents of data file with litterfall analysis information (optional)	II
Ozone	32	XX2000.pac: Ambient air quality: Ozone	II
Ozone	33	XX2000.pps: Ambient air quality: Ozone	II
Ozone	34	XX2000.aqm: Ambient air quality: Ozone	II
Ozone injury	35	XX2004.PLL: Ozone injury assessment	II
Ozone injury	36	XX2004.LTF: Ozone injury assessment	II
Ozone injury	37	XX2004.LSS: Ozone injury assessment	II
Phenology	38	XX2004.PLP: Form for registration of trees selected for intensive phenological monitoring	II
Phenology	39	XX2004.PHE: Phenological phenomena and biotic and abiotic (damaging) events (plot level - extensive)	II
Phenology	40	XX2004.PHI: Recording of phenological phenomena and biotic and abiotic (damaging) events (tree level - intensive)	II

Forms:

[Forms are only available in Excel-format]

CHAPTER 15

CODE LIST AND EXPLANATORY ITEMS FOR SURVEY DATA OF LEVEL I AND LEVEL II

The following instructions and codes shall be used for the transmission of data collected on the Level I and Level II networks in the framework of Regulation (EC) N 2152/2003. Amendments for particular reporting years are provided in Technical Specifications reports issued by DG JRC.

General information on plot

(1) Country

01: France	51: Hungary
02: Belgium	52: Romania
03: Netherlands	53: Poland
04: Germany	54: Slovak Republic
05: Italy	55: Norway
06: United Kingdom	56: Lithuania
07: Ireland	57: Croatia
08: Denmark	58: Czech Republic
09: Greece	59: Estonia
10: Portugal	60: Slovenia
11: Spain	61: Republic of Moldova
12: Luxembourg	62: Russia
13: Sweden	63: Bulgaria
14: Austria	64: Latvia
15: Finland	66: Cyprus
50: Switzerland	

(2) *Observation plot number*

The observation plot number corresponds to a unique number given to the permanent plot during the selection or installation.

(3) *Date of observation, date of assessment, date of analysis*

Dates shall be completed in the following order day, month and year:

Day	Month	Year
08	09	04

(4) *Latitude-/longitude coordinates*

Fill in the full six figures latitude and longitude coordinates of the centre of the observation plot (e.g.):

	+/-	Degrees		Minutes		Seconds	
latitude	+	5	0	1	0	2	7
longitude	-	0	1	1	5	3	2

The first box is used to indicate a + or – coordinate

(5) *Availability of water to principal species (estimate)*

- 1: Insufficient
- 2: Sufficient
- 3: Excessive

(6) *Humus type*

- 1: Mull
- 2: Moder
- 3: Mor
- 4: Anmor
- 5: Peat
- 6: Other
- 7: Raw (Roh)

(7) *Altitude*

- | | | | |
|----|-----------|----|---------------|
| 1 | ≤ 50 m | 13 | 601—650 m |
| 2 | 51—100 m | 14 | 651—700 m |
| 3 | 101—150 m | 15 | 701—750 m |
| 4 | 151—200 m | 16 | 751—800 m |
| 5 | 201—250 m | 17 | 801—850 m |
| 6 | 251—300 m | 18 | 851—900 m |
| 7 | 301—350 m | 19 | 901—950 m |
| 8 | 351—400 m | 20 | 951—1 000 m |
| 9 | 401—450 m | 21 | 1 001—1 050 m |
| 10 | 451—500 m | 22 | 1 051—1 100 m |
| 11 | 501—550 m | 23 | 1 101—1 150 m |
| 12 | 551—600 m | 24 | 1 151—1 200 m |

25	1 201—1 250 m	39	1 901—1 950 m
26	1 251—1 300 m	40	1 951—2 000 m
27	1 301—1 350 m	41	2 001—2 050 m
28	1 351—1 400 m	42	2 051—2 100 m
29	1 401—1 450 m	43	2 101—2 150 m
30	1 451—1 500 m	44	2 151—2 200 m
31	1 501—1 550 m	45	2 201—2 250 m
32	1 551—1 600 m	46	2 251—2 300 m
33	1 601—1 650 m	47	2 301—2 350 m
34	1 651—1 700 m	48	2 351—2 400 m
35	1 701—1 750 m	49	2 401—2 450 m
36	1 751—1 800 m	50	2 451—2 500 m
37	1 801—1 850 m	51	>2 500 m
38	1 851—1 900 m		

(8) *Orientation*

- 1: N
- 2: NE
- 3: E
- 4: SE
- 5: S
- 6: SW
- 7: W
- 8: NW
- 9: flat

(9) *Mean age of dominant storey (years)*

- 1: ≤ 20
- 2: 21—40
- 3: 41—60
- 4: 61—80
- 5: 81—100
- 6: 101—120
- 7: > 120
- 8: Irregular stands

(10) *Soil unit*

Fluvisols	111	Andic Gleysols	Leptosols
	112	Mollic Gleysols	
101 Eutric Fluvisols	113	Umbric Gleysols	122 Eutric Leptosols
102 Calcaric Fluvisols	114	Thionic Gleysols	123 Dystric Leptosols
103 Dystric Fluvisols	115	Gelic Gleysols	124 Rendzic Leptosols
104 Mollic Fluvisols			125 Mollic Leptosols
105 Umbric Fluvisols			126 Umbric Leptosols
106 Thionic Fluvisols			127 Lithic Leptosols
107 Salic Fluvisols			128 Gelic Leptosols
Gleysols		Regosols	
	116	Eutric Regosols	
108 Eutric Gleysols	117	Calcaric Regosols	Arenosols
109 Calcic Gleysols	118	Gypsic Regosols	
110 Dystric Gleysols	119	Dystric Regosols	129 Haplic Arenosols
	120	Umbric Regosols	130 Cambic Arenosols
	121	Gelic Regosols	131 Luvic Arenosols

132	Ferralic Arenosols	Solonchaks		Planosols	
133	Albic Arenosols				
134	Calcaric Arenosols	168	Haplic Solonchaks	205	Eutric Planosols
135	Gleyic Arenosols	169	Mollic Solonchaks	206	Dystric Planosols
		170	Calcic Solonchaks	207	Mollic Planosols
		171	Gypsic Solonchaks	208	Umbric Planosols
Andosols		172	Sodic Solonchaks	209	Gelic Planosols
		173	Gleyic Solonchaks		
136	Haplic Andosols	174	Gelic Solonchaks	Podzoluvisols	
137	Mollic Andosols				
138	Umbric Andosols	Kastanozems		210	Eutric Podzoluvisols
139	Vitric Andosols			211	Dystric Podzoluvisols
140	Gleyic Andosols	175	Haplic Kastanozems	212	Stagnic Podzoluvisols
141	Gelic Andosols	176	Luvic Kastanozems	213	Gleyic Podzoluvisols
		177	Calcic Kastanozems	214	Gelic Podzoluvisols
Vertisols		178	Gypsic Kastanozems		
				Podzols	
142	Eutric Vertisols	Chernozems			
143	Dystric Vertisols			215	Haplic Podzols
144	Calcic Vertisols	179	Haplic Chernozems	216	Cambic Podzols
145	Gypsic Vertisols	180	Calcic Chernozems	217	Ferric Podzols
		181	Luvic Chernozems	218	Carbic Podzols
		182	Glossic Chernozems	219	Gleyic Podzols
Cambisols		183	Gleyic Chernozems	220	Gelic Podzols
146	Eutric Cambisols	Phaeozems		Acrisols	
147	Dystric Cambisols				
148	Humic Cambisols	184	Haplic Phaeozems	221	Haplic Acrisols
149	Calcaric Cambisols	185	Calcaric Phaeozems	222	Ferric Acrisols
150	Chromic Cambisols	186	Luvic Phaeozems	223	Humic Acrisols
151	Vertic Cambisols	187	Stagnic Phaeozems	224	Plinthic Acrisols
152	Ferralic Cambisols	188	Gleyic Phaeozems	225	Gleyic Acrisols
153	Gleyic Cambisols				
154	Gelic Cambisols	Greyzems		Alisols	
		189	Haplic Greyzems	226	Haplic Alisols
Calcisols		190	Gleyic Greyzems	227	Ferric Alisols
				228	Humic Alisols
155	Haplic Calcisols	Luvisols		229	Plinthic Alisols
156	Luvic Calcisols			230	Stagnic Alisols
157	Petric Calcisols	191	Haplic Luvisols	231	Gleyic Alisols
		192	Ferric Luvisols		
Gypsisols		193	Chromic Luvisols		
		194	Calcic Luvisols	Nitisols	
158	Haplic Gypsisols	195	Vertic Luvisols		
159	Calcic Gypsisols	196	Albic Luvisols	232	Haplic Nitisols
160	Luvic Gypsisols	197	Stagnic Luvisols	233	Rhodic Nitisols
161	Petric Gypsisols	198	Gleyic Luvisols	234	Humic Nitisols
Solonetz		Lixisols		Ferralsols	
162	Haplic Solonetz	199	Haplic Lixisols	235	Haplic Ferralsols
163	Mollic Solonetz	200	Ferric Lixisols	236	Xanthic Ferralsols
164	Calcic Solonetz	201	Plinthic Lixisols	237	Rhodic Ferralsols
165	Gypsic Solonetz	202	Albic Lixisols	238	Humic Ferralsols
166	Stagnic Solonetz	203	Stagnic Lixisols	239	Geric Ferralsols
167	Gleyic Solonetz	204	Gleyic Lixisols	240	Plinthic Ferralsols

Plinthosols	Histosols	Anthrosols
241 Eutric Plinthosols	245 Follic Histosols	250 Aric Anthrosols
242 Dystric Plinthosols	246 Terric Histosols	251 Fimic Anthrosols
243 Humic Plinthosols	247 Fibric Histosols	252 Cumulic Anthrosols
244 Albic Plinthosols	248 Thionic Histosols	253 Urbic Anthrosols
	249 Gelic Histosols	

(11) *Size of total plot, size of sub-plot*

The size of the total plot, or sub-plot shall be stated in 0,0001 ha.

(12) *Number of trees in total plot*

The tree sample on both Levels includes all tree species, provided the trees have a minimum height of 60 cm.

(13) *Yield estimates*

The yield estimates consist of an absolute and a relative yield estimate.

The absolute estimate will be the estimated average yield over the total life period of the stand. The relative yield will indicate whether the absolute yield estimate is considered to be low, normal or high for the stand. The following codes will be used:

Absolute yield code	Relative yield code
0 = 0,0—2,5 m ³ per hectare per year	1 = Low
1 = 2,5—7,5 m ³ per hectare per year	2 = Normal
2 = 7,5—12,5 m ³ per hectare per year	3 = High
3 = 12,5—17,5 m ³ per hectare per year	
4 = 17,5—22,5 m ³ per hectare per year	
5 = >22,5 m ³ per hectare per year	

(14) *Other Observations*

Relevant information concerning the plot shall be stated here.

General information on tree level(15) *Sample tree number*

The tree number is the number which has been assigned to the tree during the installation of the plot.

(16) *Species (Reference Flora Europaea)*

Broadleaves (* = species to be used for the foliage inventory)

001: Acer campestre *	007: Alnus glutinosa *
002: Acer monspessulanum *	008: Alnus incana
003: Acer opalus	009: Alnus viridis
004: Acer platanoides	010: Betula pendula *
005: Acer pseudoplatanus *	011: Betula pubescens *
006: Alnus cordata *	012: Buxus sempervirens

013:	<i>Carpinus betulus</i> *	051:	<i>Quercus robur</i> (<i>Q. pedunculata</i>) *
014:	<i>Carpinus orientalis</i>	052:	<i>Quercus rotundifolia</i> *
015:	<i>Castanea sativa</i> (<i>C. vesca</i>) *	053:	<i>Quercus rubra</i> *
016:	<i>Corylus avellana</i> *	054:	<i>Quercus suber</i> *
017:	<i>Eucalyptus</i> sp. *	055:	<i>Quercus trojana</i>
018:	<i>Fagus moesiaca</i> *	056:	<i>Robinia pseudoacacia</i> *
019:	<i>Fagus orientalis</i>	057:	<i>Salix alba</i>
020:	<i>Fagus sylvatica</i> *	058:	<i>Salix caprea</i>
021:	<i>Fraxinus angustifolia</i> spp. <i>oxycarpa</i> (<i>F. oxyphylla</i>) *	059:	<i>Salix cinerea</i>
022:	<i>Fraxinus excelsior</i> *	060:	<i>Salix eleagnos</i>
023:	<i>Fraxinus ornus</i> *	061:	<i>Salix fragilis</i>
024:	<i>Ilex aquifolium</i>	062:	<i>Salix</i> sp.
025:	<i>Juglans nigra</i>	063:	<i>Sorbus aria</i>
026:	<i>Juglans regia</i>	064:	<i>Sorbus aucuparia</i>
027:	<i>Malus domestica</i>	065:	<i>Sorbus domestica</i>
028:	<i>Olea europaea</i> *	066:	<i>Sorbus torminalis</i>
029:	<i>Ostrya carpinifolia</i> *	067:	<i>Tamarix africana</i>
030:	<i>Platanus orientalis</i>	068:	<i>Tilia cordata</i>
031:	<i>Populus alba</i>	069:	<i>Tilia platyphyllos</i>
032:	<i>Populus canescens</i>	070:	<i>Ulmus glabra</i> (<i>U. scabra</i> , <i>U. montana</i>)
033:	<i>Populus hybrides</i> *	071:	<i>Ulmus laevis</i> (<i>U. effusa</i>)
034:	<i>Populus nigra</i> *	072:	<i>Ulmus minor</i> (<i>U. campestris</i> , <i>U. carpinifolia</i>)
035:	<i>Populus tremula</i> *	073:	<i>Arbutus unedo</i>
036:	<i>Prunus avium</i> *	074:	<i>Arbutus andrachne</i>
037:	<i>Prunus dulcis</i> (<i>Amygdalus communis</i>)	075:	<i>Ceratonia siliqua</i>
038:	<i>Prunus padus</i>	076:	<i>Cercis siliquastrum</i>
039:	<i>Prunus serotina</i>	077:	<i>Erica arborea</i>
040:	<i>Pyrus communis</i>	078:	<i>Erica scoparia</i>
041:	<i>Quercus cerris</i> *	079:	<i>Erica manipuliflora</i>
042:	<i>Quercus coccifera</i> (<i>Q. calliprinos</i>) *	080:	<i>Laurus nobilis</i>
043:	<i>Quercus faginea</i> *	081:	<i>Myrtus communis</i>
044:	<i>Quercus frainetto</i> (<i>Q. conferta</i>) *	082:	<i>Phillyrea latifolia</i>
045:	<i>Quercus fruticosa</i> (<i>Q. lusitanica</i>)	083:	<i>Phillyrea angustifolia</i>
046:	<i>Quercus ilex</i> *	084:	<i>Pistacia lentiscus</i>
047:	<i>Quercus macrolepis</i> (<i>Q. aegilops</i>)	085:	<i>Pistacia terebinthus</i>
048:	<i>Quercus petraea</i> *	086:	<i>Rhamnus oleoides</i>
049:	<i>Quercus pubescens</i> *	087:	<i>Rhamnus alaternus</i>
050:	<i>Quercus pyrenaica</i> (<i>Q. toza</i>) *	099:	Other broadleaves

Conifers (* = species to be used for the foliage inventory)

100:	<i>Abies alba</i> *	108:	<i>Cedrus deodara</i>
101:	<i>Abies borisii-regis</i> *	109:	<i>Cupressus lusitanica</i>
102:	<i>Abies cephalonica</i> *	110:	<i>Cupressus sempervirens</i>
103:	<i>Abies grandis</i>	111:	<i>Juniperus communis</i>
104:	<i>Abies nordmanniana</i>	112:	<i>Juniperus oxycedrus</i> *
105:	<i>Abies pinsapo</i>	113:	<i>Juniperus phoenicea</i>
106:	<i>Abies procera</i>	114:	<i>Juniperus sabina</i>
107:	<i>Cedrus atlantica</i>	115:	<i>Juniperus thurifera</i> *

116:	<i>Larix decidua</i> *	129:	<i>Pinus nigra</i> *
117:	<i>Larix kaempferi</i> (L. <i>leptolepis</i>)	130:	<i>Pinus pinaster</i> *
118:	<i>Picea abies</i> (P. <i>excelsa</i>) *	131:	<i>Pinus pinea</i> *
119:	<i>Picea omorika</i>	132:	<i>Pinus radiata</i> (P. <i>insignis</i>) *
120:	<i>Picea sitchensis</i> *	133:	<i>Pinus strobus</i>
121:	<i>Pinus brutia</i> *	134:	<i>Pinus sylvestris</i> *
122:	<i>Pinus canariensis</i>	135:	<i>Pinus uncinata</i> *
123:	<i>Pinus cembra</i>	136:	<i>Pseudotsuga menziesii</i> *
124:	<i>Pinus contorta</i> *	137:	<i>Taxus baccata</i>
125:	<i>Pinus halepensis</i> *	138:	<i>Thuja</i> sp.
126:	<i>Pinus heldreichii</i>	139:	<i>Tsuga</i> sp.
127:	<i>Pinus leucodermis</i>	199:	Other conifers
128:	<i>Pinus mugo</i> (P. <i>montana</i>)		

Information with regard to the crown condition survey and increment measurement

(17) Defoliation

Defoliation figure for each sample tree expressed as a percentage (in steps of 5 %) compared with a tree with complete foliage. The actual percentage is used.

- 0 = 0 %
- 5 = 1-5 %
- 10 = 6-10 %
- 15 = 11-15 %
- etc.

(18) Discoloration codes

- 0: no discoloration (0-10 %)
- 1: slight discoloration (11-25 %)
- 2: moderate discoloration (26-60 %)
- 3: severe discoloration (>60 %)
- 4: dead

(19) Identification of damage type

Where possible, further identification of the damage type should be added, e.g. for insects: the species or group (e.g. 'bark beetles').

(20) Exposure

- 1: No special exposure (plot located within a larger forest area with no or gentle relief)
- 2: Limited exposure (plots near forest edge, on slopes, etc.)
- 3: Severely exposed plots (on mountain tops, etc.)

(21) Removals and mortality

Code 0: tree alive and measurable (new, note this is different than a missing value)

- 01 tree alive, in current and previous inventory (formerly blank)
- 02 new alive tree
- 03 alive tree (present but not assessed in previous inventory)

Code 1-: tree removed, disappeared

- 11 planned utilization (as in CC)
- 12 utilization for biotic reason (as in CC)
- 13 utilization for abiotic reason (as in CC)
- 14 cut, reason unknown
- 18 reason for disappearance unknown (as in CC)

Code 2-: tree still alive and standing, but no tree crown measurements taken or height measurements should not be used in stand or growth calculations.

- 21 lop-sided or hanging tree (as in CC)
- 22 not applicable, use 24 or 25 instead
- 23 not applicable
- 24 breakage of the tip(s) of the tree (shoot)
- 25 tree not in height growth sample
- 29 other reasons, specify

Code 3-: Standing dead (at least 1,3 m in height)

- 31 tree with intact crown, biotic reason (as in CC)
- 32 tree with intact crown, abiotic reason (as in CC)
- 33 crown breakage
- 34 stem breakage, below crown base and above 1,3 m
- 38 tree with intact crown, unknown cause of death (as in CC)

Code 4-: fallen alive or dead, (height below 1,3 m or tree stem or crown touches the ground at one place)

- 41 abiotic reasons (as in CC)
- 42 biotic reasons (as in CC)
- 48 unknown cause (as in CC)

Notes:

- class 22 is only applicable in those countries that do not record trees with more than 50 % crown damage
- class 23 is only applicable in those countries that restrict sampling to Kraft classes 1, 2 and 3

(22) *Social class*

- 1 pre-dominant (including free standing trees) trees with upper crown standing above the general level of the canopy
- 2 dominant — trees with crowns forming the general level of the canopy
- 3 co-dominant — trees extending into the canopy and receiving some light from above but shorter than 1 or 2
- 4 suppressed — trees with crowns below the general level of the canopy, receiving no direct light from above

(23) *Crown shading*

- 1: crown significantly affected (shaded or physical interactions) on one side
- 2: crown significantly affected (shaded or physical interactions) on two sides
- 3: crown significantly affected (shaded or physical interactions) on three sides
- 4: crown significantly affected (shaded or physical interactions) on four sides
- 5: crown open-grown or with no evidence of shading effects
- 6: suppressed trees

(24) *Visibility*

- 1: whole crown is visible
- 2: crown only partially visible
- 3: crown only visible with backlighting (i.e. in outline)
- 4: crown not visible

(25) *Diameter at breast height (DBH)*

The diameter at breast height (1,30 m) over bark in 0,1 centimetre.

When a diameter tape is used a single value will be needed. When calipers are used the maximum and the minimum diameter (over bark) shall be determined and reported (diameter 1 and diameter 2).

(26) *Bark*

The thickness of the bark at 1,30 m, expressed in centimetres with one decimal.

(27) *Height of the tree*

The height of the tree expressed in meters and rounded off to the nearest 0,1 metre.

(28) *Tree volume*

Based on the measured diameter(s) and height, the tree volume can be estimated using locally known form factors or through the use of valid volume tables. The tree volume shall be expressed in cubic meters (m^3) with three decimals.

(29) *Height up to crown*

The height up to crown rounded off to the nearest 0,1 meter is determined up to the lowest live branch excluding water shoots.

(30) *Crown length*

The length of the crown rounded off to the nearest 0,1 meter is determined from the tip of the stem to the lowest live branch excluding water shoots.

(31) *Crown width*

The average crown width is determined by the average of at least four crown radii, multiplied by two, and rounded off to the nearest 0,1 meter.

(32) *Diameter under bark*

The actual diameter under bark is calculated as the diameter over bark deducted with the width of the bark at the two sides. The diameter under bark of five years ago is calculated as the actual diameter under bark less the increment of the last five years of the tree at both sides. The diameter under bark is expressed in 0,1 centimetre.

(33) *Basal area per plot*

The actual basal area per plot is calculated as the total basal areas of all the trees in the plot. The basal area per plot of five years ago is calculated on the basis of the estimated diameter under bark of five years ago of all the trees in the plot. Basal area per plot is expressed in $0,1 m^2$.

(34) *Volume per plot*

The actual volume per plot is calculated as the total volume of all the trees in the plot. The volume per plot of five years ago is calculated on the basis of the estimated diameter under bark of five years ago of all the trees in the plot. Volume per plot is expressed in $0,1 m^3$.

(35) *Thinning*

If a thinning has taken place in the five-year period between the two years of determination of diameter, basal area per plot and volume per plot, this will be indicated (Yes = 1, No = 0). In an additional part the details of this thinning will be described as detailed as possible (including: thinning method, exact year of thinning, thinning intensity expressed as number of trees, basal area/ha, volume/ha).

Information with regard to foliar chemistry measurements and litterfall assessment

(36) *Sample code*

The sample code for the foliage inventory consists of the tree species code (see explanation item 15) followed (after a dot) by the code for leaves/needles of the current year (=0) or in the case of needles of the last year (current + 1 needles) use the code (1), e.g. the sample of needles of last year of the *Picea abies* (118) is thus: 118.1

(37) *Tree numbers of the sample*

As in some samplings (foliage, increment) trees outside the normal plot (or sub-plot) have to be used, special numbers have to be applied. The numbers of these trees will start with a letter (F = foliage, R = ring analysis by increment borings, D = discs analysis) followed with a sequence number (e.g. F001). The numbers are to be reported.

(38) *Mass of 100 leaves or 1 000 needles*

The mass is determined of 100 leaves or 1 000 needles (oven-dry) in grams.

Information with regard to the deposition monitoring and meteorological monitoring

(39) *Sampler code*

The following codes shall be used for the samplers for deposition.

- 1: throughfall
- 2: bulk deposition
- 3: wet-only deposition
- 4: stemflow
- 5: fog
- 6: frozen fog (rime)
- 7: air concentration
- 9: others

Details on the equipment used shall be stated in an Annex to the document with the background information.

(40) *Sample quantity*

The total collected quantity of the sample(s) shall be divided by the catchment area(s) of the collector(s) and shall be reported in millimeters.

(41) *First and final dates of the monitoring period*

The first and final dates of each monitoring period shall be stated on the forms, using the same format as the date of observation, assessment and analysis.

A monitoring period shall consist of one or more measuring periods. The measuring periods within one monitoring period should have the same length. The minimum length of a measuring period is one week, the maximum one month.

When it is necessary to use different measuring periods during the year (e.g. weekly in summer and monthly in winter), two separate monitoring periods shall be identified and the results shall be reported separately on the forms.

(42) *Number of measuring periods*

The number of measuring periods in each monitoring period shall be indicated in the forms.

(43) *Measuring period*

The measuring period number in which the sample has been collected shall be stated. Each year (on or around 1 January) a new set of measuring periods will be started. When samples from several measuring periods are combined before analysis, the exact details of the mixing shall be stated in the annex to the document with background information. The number of the first measuring period shall be used to indicate the period for analysis (e.g. when the samples from period 9, 10, 11 and 12 are combined into a single sample for the analysis, this sample will be given the period number 9).

Parameters to be assessed in the plot/instrument code

All instruments that are installed in or near the plot, are given an observation plot/instrument code. This code consists of the plot number (up to four digits) and a sequential number for all instruments (up to 99). When instruments are replaced or added, new codes are applied. (e.g. the fifth instrument in plot 1234 will thus receive code 1234.05).

(44) *Location*

The location of the instrument is indicated:

- S: instrument is located on site, i.e. in (the buffer zone) of the plot. This could be under the canopy, above the canopy or in the forest soil
- F: instrument is located in a (nearby) open field in the forest area
- W: instrument is located at a weather station (in general outside the forest area)
- O: instrument is located elsewhere.

(45) *Variable*

Indication of the variable that is measured with the instrument

- AT = air temperature
- PR = precipitation
- RH = relative humidity
- WS = wind speed
- WD = wind direction
- SR = solar radiation
- UR = UVb radiation
- TF = throughfall
- SF = stemflow
- ST = soil temperature
- MP = matric potential in the soil
- WC = water content in the soil
- XX = other codes for additional parameters may be used, but should be specified in the DAR.

Instrument information

(46) *Vertical position*

The vertical position (height or depth) of the instruments shall be indicated in meters with a plus (= height above the ground) or a minus sign (depth below the ground) using the format of a plus/minus two digits and one decimal (+/-99,9).

(47) *Instrument code*

The following codes shall be used for the samplers and recording method of data:

- 10: manual reading and recording on paper
- 20: mechanical recording (manual reading and recording on paper)
- 30: direct paper recording
- 40: digital recording (in stand alone situation)
- 50: digital recording (integrated data logger)

Details of the equipment shall be given in the data accompanying report (DAR).

(48) *Scanning interval (automatic instruments only)*

The interval between two consecutive assessments shall be given stated in seconds.

(49) *Storing interval (automatic instruments only)*

The interval between two consecutive data storage moments shall be given in minutes

(50) *Precipitation and throughfall*

The precipitation shall be given as the daily sum, using the format of up to four digits and one decimal (9999,9)

(51) *Temperature (air and soil)*

The temperature shall be given in °C, using the format of a plus/minus and two digits plus one decimal (+/-99,9). The daily mean, daily minimum and daily maximum are to be submitted.

(52) *Relative Humidity*

The relative humidity shall be given as the daily mean, the minimum and the maximum value reached per day, using the format of three digits and one decimal (999,9).

(53) *Wind speed*

The wind speed shall be given as the daily mean and the maximum value reached per day, using the format of two digits and one decimal (99,9).

(54) *Wind direction*

The wind direction shall be given as the prevailing wind per day. The wind rose shall be split into eight sections of 45° starting from 22,5° onwards (NE (=45°), E (=90°), SE (=135°)... N (=0°). The most frequent wind direction is reported by its middle value.

(55) *Solar radiation and UVb radiation*

The solar radiation and the UVb radiation shall be given as the daily mean value, using the format of up to four digits and one decimal (9999,9).

(56) *Stem flow*

The stem flow shall be calculated to mm precipitation and shall be given as the daily sum, using the format of up to four digits and one decimal (9999,9).

(57) *Matric potential in the soil*

The matric potential in the soil shall be given in hPa, as the daily mean, minimum and maximum value reached per day, using the format of up to four digits and one decimal (9999,9).

(58) *Water content in the soil*

The water content in the soil shall be given in Volume % as the daily mean, the minimum and the maximum value reached per day, using the format of up to two digits and one decimal (99,9).

(59) *Completeness*

The completeness is an indicator of the coverage of the scanning and storing procedures and is given in percentages using the format of up to three digits (100 % = complete).

Information with regard to the soil solution monitoring(60) *Sampler number*

The samplers in the plot shall be numbered in a permanent way (1 — 99)

(61) *Sampler code*

The following codes shall be used for the samplers for soil solution:

- 1: Tension lysimeter
- 2: Zero tension lysimeter
- 3: Centrifugation
- 4: Saturation extraction

(62) *Sampling depth*

The sampling depth in meters below the surface (e.g. – 0,40)

Information with regard to the ground vegetation assessment(63) *Plot/survey number*

Each time (day), or situation (inside outside fence), that an assessment of the ground vegetation is made on a given plot, a survey number is given. By combining the plot number with the survey number a unique plot/survey number is created.

(64) *Fencing*

As the vegetation can be very different inside and outside a fence, it was decided that in principle the ground vegetation is always surveyed outside the fence. When a survey inside the fence is carried out this should be reported as a separate survey and the fencing code indicated:

- 1 = Yes, survey within the fence,
- 2 = No, survey was outside fenced area.

(65) *Total sampled area*

The total sample area shall be given in m² in up to four digits. In the data accompanying report (or DAR-Q) the exact details of the number of repetitions, the location/orientation of the ground vegetation plots and the sizes of these plots shall be given.

(66) *Height and cover of layers*

The average height and estimated cover of the total ground vegetation layer, the shrub layer, the herb layer and the moss layer shall be submitted as follows:

	Height (in m)	Cover (in %)
Total ground vegetation layer		(*)
Shrub layer	(*)	(*)
Herb layer	(*)	(*)
Moss layer		(*)

(*) = To be submitted.

The average height of the layers shall be given in meters in one digit and two decimals (9.99). The estimated cover shall be given as a % of the total sampled area.

(67) *Layers*

The following layers are defined.

- 1 = tree layer (only ligneous, incl. climbers) > 5 m height
- 2 = shrub layer (only ligneous, incl. climbers) > 0,5 m height
- 3 = herb layer (all non-ligneous, and ligneous < 0,5m height)
- 4 = moss layer (i.e. terricolous bryophytes and lichens).

Seedlings and browsed trees below 0,5 m should be part of the herb layer.

(68) *Species code*

A species code is to be applied, which consists of three groups of number codes for the family, genus and species separated by dots (.). Most codes consist of a three-digit number.

(69) *Cover of plant species*

Countries are free in the assessment of the abundance/cover of the plant species. The submission of this cover is in % using three digits and two decimals (999,99). In the DAR the complete assessment methods, as well as the conversion to % shall be specified.

Information with regards to ozone injury

(70) *Scoring and definition for the percentage of symptomatic leaves on a branch with approximately 30 leaves*

- 0 No injury, none of the leaves injured.
- 1 1 %-5 % of the leaves show ozone symptoms
- 2 6 %-50 % of the leaves show ozone symptoms
- 3 51 %-100 % of leaves show ozone symptoms

(71) *Scoring and scoring definition for visible ozone injury as it is expressed on the respective needle years for the collected branch lets of conifer species*

- 0 No injury present
- 1 1-5 % of the surface is affected
- 2 6- 50 % of the surface is affected
- 3 51 – 100 % of the surface is affected.

(72) *Code and definition for the classification of the soil moisture conditions within the LESS and subplots*

- 1 Wet or damp (riparian zones and wet or damp areas along a stream, meadow or bottom land)
- 2 Moderately dry (grassland or meadow, and North or East facing slopes)
- 3 Very dry (exposed rocky edges)

Information with regard to phenological observations

(73) *Event codes for the monitored effects and phenological phenomena*

- 1 Needle appearance or leaf unfolding
- 2 Lammas shoots/secondary flushing
- 3 Flowering
- 4 Color changes
- 5 Leaf/needle fall
- 6 Significant signs of leaf or crown damage (e.g., eaten leaves or bare crown parts)
- 7 Other damage (breakage, uprooted trees).

(74) *Occurrence of the events and phenomena*

- 0 = 0 %
- 1 = >0 – 33 %
- 2 = >33 – 66 %
- 3 = >66 - <100 %
- 4 = 100 %.

In case significant signs of leaf or crown damage (event code 6) or other damage (event code 7) are observed, an additional assessment should be made according to the submanual on crown condition and its guidelines for the assessment of the cause of damage.

(75) *Part of the crown observed*

- 1 = top of the crown
- 2 = middle of the crown
- 3 = top and middle of the crown

(76) *Flowering phases*

The number of male flowers that are in the described stage or have already passed this stage is to be recorded using the following classification:

- 0 = the phase is absent
- 1 = the phase is present (e.g. three or more male (staminate) inflorescences).

(77) *Needle appearance, leaf unfolding, autumn coloring and leaf fall*

The proportion of needles or leaves of the visible part of the crown that are in the described stage or have already passed this stage is to be recorded using the following classification:

- 0 = 0 %
- 1 = >0 – 33 %
- 2 = >33 – 66 %
- 3 = >66 - <100 %
- 4 = 100 %.

(78) *Shedding of green leaves*

Shedding of green leaves caused by e.g. hail, windstorms, insects or drought should be recorded using the following classification (according to the 'recording of biotic and abiotic (damaging) events', but on the individual tree level):

- 0 = 0 %
- 1 = >0 – 33 %
- 2 = >33 – 66 %
- 3 = >66 - <100 %
- 4 = 100.

(79) *Frost damage of needles, leaves or flowers*

Damage of needles, leaves or flowers caused by late frost in spring should be recorded using the following classification:

- 0 = 0 %
- 1 = >0 – 33 %
- 2 = >33 – 66 %
- 3 = >66 - <100 %
- 4 = 100

If significant signs of leaf or crown damage (event code 6) or other damage (event code 7) are observed, then an additional assessment should be made according to the submanual on crown condition and its guidelines for the assessment of the causes of damage.

Information with regard to additional information on damages causes

(80) *Location in crown*

- 1: Upper crown
- 2: Lower crown
- 3: Patches/by branches
- 4: Total crown

(81) *Affected parts of a tree and location in the crown*

Affected part		Specification of affected part		Symptom		Symptom specification		Location in crown	
Leaves/needles	1	Current year needles	11	Partly or totally devoured/missing	01	holes or partly devoured/missing	31	Upper crown	1
		Older needles	12			notches (leaf/needle margins affected)	32	Lower crown	2
		Needles of all ages	13			totally devoured/missing	33	Patches/branchwise	3
		Broadleaves (incl. evergreen spec.)	14			Skeletonised	34	Total crown	4
						Mined	35		
						Premature fall-ing	36		
				Light green to yellow discoloration	02	Overall	37		
				Red to brown discoloration (incl. necrosis)	03	flecking, spots	38		
				Bronzing	04	Marginal	39		
				Other color	05	Banding	40		
						Interveinal	41		
						tip, apical	42		
						Partial	43		
						along veins	44		
				microfilia (small leaves)	06				
				other abnormal size	07				

Affected part		Specification of affected part		Symptom		Symptom specification		Location in crown			
Leaves/needles				Deformations	08	Curling	45				
						Bending	46				
						Rolling	47				
						stalk twisting	48				
						Folding	49				
						Galls	50				
						Wilting	51				
						other deformations	52				
				other symptom		09					
				Signs of insects	10	black coverage on leaves	53				
						Nest	54				
						adults, larvae, nymph, pupae, egg masses	55				
Signs of fungi	11	white coverage on leaves	56								
		fungal fruiting bodies	57								
Other signs		12									
Branches/shoots & buds	2	Current year shoots	21	devoured/missing	01			Upper crown	1		
		diameter < 2 cm (twigs)	22					Broken	13	Lower crown	2
		diameter 2 - < 10 cm	23					Dead/dying	14	Patches	3
		diameter >= 10 cm	24					Abortion	15	Total crown	4
		varying size	25					Necrosis	16		
		Top leader shoot	26					Wounds (debarking, cracks etc.)	17	Debarking	58
		Buds	27	Cracks	59						
				other wounds	60						
		Resin flow (conifers)		18							
		Slime flux (broadleaves)		19							
		Decay/rot		20							

Affected part		Specification of affected part		Symptom		Symptom specification		Location in crown	
Branches/shoots & buds				Deformations	08	Wilting	51		
						bending, drooping, curving	61		
						Cankers	62		
						Tumours	63		
						witches broom	64		
						other deformations	52		
				other symptom	09				
				Signs of insects	10	boring holes, boring dust	65		
						Nest	54		
						white dots or covers	66		
Stem/collar	3	Crown stem	31			adults, larvae, nymph, pupae, egg masses	55		
				Signs of fungi	11	fungal fruiting bodies	57		
				Other signs	12				
				Wounds (debarking, cracks etc.)	17	Debarking	58		
						cracks (frost cracks, ...)	59		
						other wounds	60		
				Resin flow (conifers)	18				
				Slime flux (broadleaves)	19				
				Decay/rot	20				
				Deformations	08	Cankers	62		
		Bole	32			Tumours	63		
						Longitudinal ridges (frost ribs, ...)			
						other deformations	52		
		Roots (exposed) & collar	33						
		Whole trunk	34						

Affected part		Specification of affected part		Symptom		Symptom specification		Location in crown	
Stem/collar				tilted	21				
				fallen (with roots)	22				
				broken	13				
				Necrosis	16				
				other symptom	09				
				Signs of insects	10	boring holes, boring dust	65		
						white dots or covers	66		
						adults, larvae, nymph, pupae, egg masses	55		
				Signs of fungi	11	fungal fruiting bodies	57		
						yellow to orange blisters	67		
Dead tree	4								
No symptoms on any part of tree	0								
No assessment	9								

(82) Main categories of causal agents/factors

Agent group	Code
Game and grazing	100
Insects	200
Fungi	300
Abiotic agents	400
Direct action of men	500
Fire	600
Atmospheric pollutants	700
Other factors	800
(Investigated but) unidentified	999

(83) Agent group

Game & grazing	100
Insects	200
Fungi	300
Abiotic agents	400
Direct action of men	500
Fire	600
Atmospheric pollutants	700
Other	800
(Investigated but) unidentified	999

(84) *Agent group - Game and grazing*

Class	Code	Type	Code
Cervidae	110	Roe deer	111
		Red deer	112
		Reindeer	113
		Elk/Moose (<i>Alces alces</i>)	114
		Other Cervidae	119
Suidae	120	Wild boar	121
		Other Suidae	129
Rodentia	130	Rabbit	131
		Hare	132
		Squirrel etc.	133
		Vole	134
		Beaver	135
		Other Rodentia	139
Aves	140	Tetraonidae	141
		Corvidae	142
		Picidae	143
		Fringillidae	144
		Other Aves	149
Domestic animals	150	Cattle	151
		Goats	152
		Sheeps	153
		Other domestic	159
Other vertebrates	190	Bear	191
		Other vertebrate	199

(85) *Agent group – Insects*

Class	Code
Defoliators	210
Stem, branch and twig borers (incl. shoot miners)	220
Bud boring insects	230
Fruit boring insects	240
Sucking insects	250
Mining insects	260
Gall makers	270
Other insects	290

(86) *Agent group – Fungi*

Class	Code
Needle casts and needle- rust fungi	301
Stem and shoot rusts	302
Dieback and canker fungi	309
Blight	303
Decay & root rot fungi	304
Other fungi	390

(87) *Agent group- abiotic*

Class	Code	Type	Code	Specific factor	Code
Chemical factors	410	Nutritional disorders- nutrient deficiencies	411	Cu - deficiency	41101
				Fe - deficiency	41102
				Mg - deficiency	41103
				Mn - deficiency	41104
				K - deficiency	41105
				N - deficiency	41106
				B-deficiency	41107
				Mn - toxicity	41108
				Other	41109
		marine salt + surfactants	412		
Physical factors	420	Avalanche	421		
		Drought	422		
		Flooding/High water	423		
		Frost	424	Winter frost	42401
				Late frost	42402
		Hail	425		
		Heat/Sun scald	426		
		Lightning	427		
		Mud/land slide	429		
		Snow/Ice	430		
		Wind/Tornado	431		
		Winter injury - winter desiccation	432		
		Shallow/poor soil	433		
Other abiotic factor	490				

(88) *Agent group - Direct action of men*

Class	Code	Type	Code
Imbedded objects	510		
Improper planting technique	520		
Land use conversion	530		
Silvicultural operations or for- est harvesting	540	Cuts	541
		Pruning	542
		Resin tapping	543
		Cork stripping	544
		Silvicultural operations in close trees and other silvicultural operations	545
Mechanical/vehicle damage	550		
Road construction	560		
Soil compaction	570		
Improper use of chemicals	580	Pesticides	546
		Deicing salt	547
Other direct action of men	590		

(89) *Agent group - Atmospheric pollutants*

Class	Code
SO ₂	701
H ₂ S	702
O ₃	703
PAN	704
F	705
HF	706
Other	790

(90) *Agent group - Other*

Class	Code	Species/Type	Code
Parasitic/Epiphytic/Climbing plants	810	Viscum album	81001
		Arceuthobium oxycedri	81002
		Hedera helix	81003
		Lonicera sp	81004
Bacteria	820	Bacillus vuilemini	82001
		Brenneria quercinea	82002
Virus	830		
Nematodes	840	Bursaphelenchus xylophilus	84001
Competition	850	Lack of light	85001
		Physical interactions	85002
		Competition in general (density)	85003
		Other	85004
Somatic mutations	860		
Other (known cause but not included in the list)	890		

(91) *Extent*

The **extent** of the damage indicates the quantity (%) of the affected part of the tree due to the action of the causal agent or factor, e.g. the % of affected branches.

The extent of **symptoms reflecting defoliation** (e.g. leaf damage by defoliators) indicates the % of **the leaf area** which is lost due to the action of the agent/factor concerned. This means that the extent should take into account not only the % of affected leaves, but also the 'intensity' of the damage on leaf level: physiologically it makes a difference for a tree if 30 % of its leaves show only some small holes or if 30 % of its leaves are totally devoured.

The affected leaf area is expressed as a percentage of the actual foliage at the time of observation.

(92) *Damage extent classes*

Class	Code
0 %	0
1 – 10 %	1
11 – 20 %	2
21– 40 %	3
41 – 60 %	4
61 – 80 %	5
81 – 99 %	6

(93) *Causes name*

The nomenclature recommended by ICP Forests shall be used.

ANNEX II

MANUAL – In order to comply with Article 10 of (EC) Regulation 2152/2003**COMMON CORE FOREST FIRE DATA – TECHNICAL SPECIFICATIONS**

The following technical specifications shall apply in relation to the collection of the common core data to be recorded and notified for each forest fire occurred, as indicated in Article 9.

Data shall be supplied in comma delimited ASCII format files (i.e. CSV - Comma Separated Value format). Every fire will be one record of the file. The following information will have to be included in each fire record:

(a) Date and local time of first alert

Composed by:

- a1. Date of first alert: The local date (day, month, year) at which the official forest fire protection services were informed of the outbreak of the fire.

The expected data format is [YYYYMMDD], example: 20030702 (2 July 2003)

- a2. Time of first alert: the local time (hour, minute) at which the official forest fire protection services were informed of the outbreak of the fire.

The expected data format is [HHMM], with HH from 00 to 23. Examples: 0915, 1446, 0035.

The date and time of first alert are related to the event that triggers the activation of the fire fighting resources. Therefore it is not necessarily the time when a fire, or a possible fire, is physically reported to the forest fire office, but more generally the time when a member of the forest fire protection organization is first alerted of a possible fire or when he directly firstly detects it.

When a check for confirmation of the alert is performed before the activation of the fire fighting crews, the *very first alert* has to be reported.

(b) Date and local time of first intervention

Composed by:

- b1. Date of first intervention: the local date (day, month, year) on which the first fire-fighting units arrived on the scene of the forest fire.

The expected data format is [YYYYMMDD], example: 20030702 (2 July 2003)

- b2. Time of first intervention: the local time (hour, minute) at which the first fire-fighting units arrived on the scene of the forest fire.

The expected data format is [HHMM], with HH from 00 to 23. Examples: 0915, 1446, 0035.

The date and time of first intervention corresponds to the time when the first fire fighting crew reaches the fire front, i.e. the moment when the first attack starts.

(c) Date and local time of extinction

Composed by:

- c1. Date of fire extinction: the local date (day, month, year) on which the fire was completely extinguished, i.e. when the last fire-fighting units left the scene of the forest fire.

The expected data format is [YYYYMMDD], example: 20030702 (for 2 July 2003)

- c2. Time of fire extinction: the local time (hour, minute) at which the fire was completely extinguished, i.e. when the last fire-fighting units left the scene of the forest fire.

The expected data format is [HHMM], with HH from 00 to 23. Examples: 0915, 1 446, 0035.

The date and time of extinction correspond to the time when the fire front was completely extinguished. Therefore it *does* include the mop up activities and it *does not* include the time for the crews to return to the headquarters.

Note: The starting of a new day is midnight (time: 00:00). Therefore, if the first alert is for example at 23:30 and the first intervention is at 00:30, than these events have to be reported in different days (*d* and *d*+1 respectively).

(d) Location of the outbreak at the commune level

The name and code of the commune ⁽¹⁾ where the outbreak of the fire was reported. It shall follow the Member State nomenclature, and the complete list of commune names and codes in use in the Member State and adopted in the common core forest fire database will have to be supplied together with the fire data in a separate file.

The code of the higher hierarchical territorial unit to which the commune belongs to shall also be recorded. Such territorial unit will correspond to the Nomenclature of territorial units for statistics (NUTS) level 3 as defined in the Regulation (EC) No 1059/2003 of the European Parliament and of the Council ⁽²⁾. The recorded NUTS3 code shall be in accordance with the five characters codes reported in Annex I of the same Regulation.

New Member States, for which a list of NUTS3 codes is not provided in Regulation (EC) No 1059/2003, will follow the standard 'Nomenclature of territorial units for statistics (NUTS)' established by the Statistical Office of the European Communities. The reported codes will be the most recent NUTS3 codes as maintained in the GISCO information system.

(e) Total fire-damaged area

The total fire-damaged area corresponds to the estimated final fire size, i.e. the extension of the final area burned by the fire (regardless of the level of damage).

The extension is measured in fraction of hectares with a precision until the second digit, without using the comma as separator (i.e. in hectares*100) Examples:

Burned area = 12,05 hectares, it shall be recorded as 1205; Burned area = 3,2 hectares, it shall be recorded as 320.

In case of unburned areas located inside the burned perimeter (unburned islands), their surface should be excluded from the estimate of the fire size

(f) Breakdown of the fire-damaged area into forest and other wooded land and non forested areas

The total burned area has to be divided into:

f(1): forest and other wooded land area

f(2): non forested area

'Forest' and 'other wooded land' are defined according to Article 3 of the Forest Focus Regulation. 'Non forested area' corresponds to the 'other land' defined in Article 3 of the same regulation. If however the fire burns also agricultural or urban land, these areas should not be included in the total burnt area.

The extension is measured in fraction of hectares until the second digit without using the comma as separator (i.e. in hectares*100).

⁽¹⁾ For Belgium 'Gemeenten/Communes', for Denmark 'Kommuner', for Germany 'Gemeinden', for Greece 'Demos/Koinotites', for Spain 'Municipios', for France 'Communes', for Ireland 'Counties or County boroughs', for Italy 'Comuni', for Luxembourg 'Communes', for the Netherlands 'Gemeenten', for Austria 'Gemeinden', for Portugal 'Freguesias', for Finland 'Kunnat/Kommuner', for Sweden 'Kommuner' and for the United Kingdom 'Wards'. For Cyprus 'Chor', for Czech Republic 'Obec', for Estonia 'Linn/Vald', for Hungary 'Telep', for Lithuania 'Savivaldybe', for Latvia 'Pagasts/Pilseta', for Poland 'Gmina', for Slovenia 'Obcina', for Slovakia 'Obce/Ku'.

⁽²⁾ OJ L 154, 21.6.2003, p. 1. Regulation as amended by Regulation (EC) No 1888/2005 (OJ L 309, 25.11.2005, p. 1).

(g) Presumed cause

The presumed cause of the fire should be classified into one of the following four categories:

1. Unknown;
2. Natural cause;
3. Accidental cause or negligence, meaning connection to a human activity but without any intention of causing the fire (e.g. accidents caused by power lines, railways, works, bonfires, etc.).
4. Deliberate cause or arson.

The datum to be recorded in the fire record is the category number (1 to 4) that is indicated in the list above.

Fire record and data example

A complete fire record will contain all the data items (fields) summarized in the table below.

Field name	Description	Ref. (*)	Length (**)	Fire data example
FIREID	MS Fire identifier			1
DATEAL	Date of first alert	a1	8	20030813
TIMEAL	Time of first alert	a2	4	1435
DATEIN	Date of first intervention	b1	8	20030813
TIMEIN	Time of first intervention	b2	4	1520
DATEEX	Date of fire extinction	c1	8	20030814
TIMEEX	Time of fire extinction	c2	4	0010
NUTS3	NUTS3 code (Regulation EC 1059/2003)	d	5	ITG21
CODECOM	Commune Code (MS nomenclature)	d		090047
NAMECOM	Commune Name (MS nomenclature)	d		OLBIA
TBA	Total Burned Area (Ha*100)	e		2540
FBA	Forested Burned Area (Ha*100)	f1		2000
NFBA	Not Forested Burned Area (Ha*100)	f2		540
CAUSE	Presumed Cause	g	1	1

(*) Reference to the paragraphs of this Annex.

(**) Length of the field (number of characters) given only for fixed length fields. The commune code, since it is reported following the MS nomenclature, might have different length according to the country.

The fire record given in the column 'Fire data example' will be recorded in the delivered CSV file as the following:

1, 20030813, 1435, 20030813, 1520, 20030814, 0010, ITG21, 090047, OLBIA, 2540, 2000, 540, 1

Important note

No one item should be left blank in a fire record. A specific code should be explicitly defined for each data type and recorded in case of missing information. Therefore missing data codes shall be defined for different data types

The following missing data codes are suggested:

Date (fields DATEAL, DATEIN, DATEEX):	99999999
Time (fields TIMEAL, TIMEIN, TIMEEX):	9999
Location (fields NUTS3, CODECOM, NAMECOM):	XX
Area (fields TBA, FBA, NFBA):	-999
Cause (field CAUSE):	9

Empty fields (with neither data nor missing data code) will be considered mistakes and the corresponding fire record will have to be processed separately.

Data quality assessment

Analytical data quality assessment will be performed upon receipt of data from the Member States, in order to ensure integrity and logical consistency of the database.

In a first stage individual fields will be examined to verify that data domains and validation rules are respected (see table below).

Field name	Data domains and validation rules for individual fields	Codes for missing data
FIREID	No duplicate values accepted (ID must exist and be unique within the country)	Missing data not accepted
DATEAL	Date must exist in the reporting year (e.g. year = reporting year; month domain: 1..12; day domain: depending on month)	99999999
TIMEAL	Domains: Hour (0..23); Minutes (0..59)	9999
DATEIN	Date must exist in the reporting year (e.g. year = reporting year; month domain: 1..12; day domain: depending on month)	99999999
TIMEIN	Domains: Hour (0..23); Minutes (0..59)	9999
DATEEX	Date must exist in the reporting year (e.g. year = reporting year; month domain: 1..12; day domain: depending on month)	99999999
TIMEEX	Domains: Hour (0..23); Minutes (0..59)	9999
NUTS3	NUTS3 code must exist in Appendix I of Regulation EC 1059/2003 (or in GISCO database for new MS)	XX
CODECOM	Commune code must correspond to a code in the list of commune codes provided by the MS	XX
NAMECOM	Commune name must correspond to a name in the list of commune names provided by the MS	XX
TBA	Domain: TBA > 0	-999
FBA	Domain: FBA ≥ 0	-999
NFBA	Domain: NFBA ≥ 0	-999
CAUSE	Domain: CAUSE in (1,2,3,4)	9

In a second stage logical consistency among fields will be checked. To this end a number of rules will be applied to the received data, such as in the following, not exhaustive, examples:

1. The temporal sequence 'date/time alarm' -> 'date/time intervention' -> 'date/time extinction' should be respected. It can only be accepted in some cases that 'date/time alarm' = 'date/time intervention' in the event that the first attack follows immediately fire detection (fire detected by a fighting crew), although this situation is not often met.
2. It shall be verified that 'Forested burned area' + 'Not forested burned area' = 'Total burned area'.
3. The commune indicated in CODECOM and NAMECOM shall belong to the territorial unit indicated in NUTS3.

ANNEX III

Evaluation criteria concerning studies, experiments

The following seven criteria listed in the table below shall be applied by the Commission for the purpose of evaluating proposals for studies, experiments and demonstration projects and testing on the basis of a pilot phase included in the national programmes.

The range of points available for each question specifying the seven criteria and the elimination scores for each questions are provided by the table below. If a proposal does not reach the minimum score for a question it shall be eliminated from the process.

Criteria	Assessment range	Eliminatory score	Assessment points
Award CRITERIA			
1. Coherence of the project	0 to 20	Less than 9	
Are the project objectives fully explained?			
Does the purpose of the project correspond with the monitoring issues addressed by Regulation (EC) No 2152/2003?			
Are the expected results explained?			
Is a clear and fully detailed explanation given of the action required?			
2. Planning	0 to 10	Less than 4	
Is the planning realistic?			
3. Financial feasibility	0 to 10	Less than 4	
Is the budgetary estimate realistic?			
4. Durability	0 to 20	Less than 15	
May the action taken and the results have a lasting impact after the project is completed?			
5. General quality of presentation	0 to 10	/	
Is the project presented in a logical and well-argued manner? Is the proposal document well structured, clear and complete?			
6. Quality of the proposal	0 to 20	Less than 9	
Evaluation of methodology and project set-up			
7. Community interest	0-20	/	
Does this project provide directly or indirectly provided added value at Community level?			

ANNEX IV

NATIONAL PROGRAMME FORMS

Explanatory notes

Types of activities:

Type A: Coordination and management:

Sub-type	Measure	Form(s)
/	Coordination costs	2a
/	Overheads costs	2a
/	Travel costs	2a
/	Data management and data transmission to the Commission as well as data dissemination costs	2a
/	Costs of elaborating the mid-term review and ex-post evaluation	2a

Type B: Costs related to monitoring of forest ecosystems (Article 4.1a/b and 5.1 of Regulation (EC) No 2152/2003)

Sub-type	Measures	Forms
B1	Periodic inventories in order to get representative information of the conditions of forests.	2b
B2	Intensive and continuous monitoring	2c
B3	Forest Fire Information System and prevention measures	2d I + II

Type C: Studies, experiments, demonstration projects and pilot phases (Article 5(2), 6(2) and 7(2) of Regulation (EC) No 2152/2003)

Sub-type	Measure	Forms
C1	Studies on the identification of causes and dynamics of forest fires.	3
C2	Studies, experiments, demonstration projects to further develop the scheme.	3
C3	Studies, experiments, demonstration projects to promote harmonised data collection and delivery, to improve data evaluation as well as data quality including calibrations courses and ring tests.	3
C4	Monitoring test phases	3

Forms

The following forms shall be used for the presentation of the multi annual national programmes:

- A short description of the programme (form 1),
- Specific information (forms 2-3).

The **programme description form** contains administrative information on the competent body and summary information on the various individual applications in the programme, along with a timetable. The form shall bear the stamp of the competent body and be duly signed and dated by it, with the name of the signatory indicated below the signature. The **programme sheet** concerning the **summary of the individual requests** has to be accompanied by a **specific information form** (containing technical information on the individual applications) to be completed for each individual application for assistance.

For **adaptations** of the national programme the completely revised **form 1** has to be accompanied by information concerning the specific measures (**form 3**). All forms have to be marked with '**Amendment to National Programme No ...**'.

The following forms are only available as Exceltables:

Form 1:	PROGRAMME SHEET Summary of the individual requests
Form 2a:	Sheet for coordination and management
Form 2b:	Sheet for Systematic Network
Form 2c:	Sheet for Intensive Monitoring
Form 2d I+II:	Sheets for Forest Fires Information System and prevention measures

Sheet 3: Sheet for C Activities

Activity (C1/C2/C3/C4)	
------------------------	--

Individual request N°	
-----------------------	--

Amendment to national programme	N°	(Yes/No)	
---------------------------------	----	----------	--

Total eligible costs (*)	Aid requested

(*) Cost to be specified in local currency or Euro (€) as specified in form 1.

Agency name:	Applicant name:
Brief description of activities: <i>(further information to be provided on a separated sheet where needed)</i>	
Objectives:	
Set-up:	
Expected results:	
Contact person: Tel.: Fax.: E-mail:	Estimated start date: Estimated end date:
Further comments:	

ANNEX V

Annual statements of the payments made to beneficiaries

Introductory remarks

Annual statements and progress reports shall be submitted in duplicate to:

European Commission
Directorate-General Environment
Unit B.3
B-1049 Brussels

- Annual statement of expenditures (Use the form in Table 1)
- State of progress of the work (Use the form in Table 2)

Table 1

Statement of expenditures for the national programme for

National Programme 200 _- 200 _

Phase: _ Period from 1/_/_/200 _ to 1/_/_/200 _

(a) Total assistance granted	(c) Total payments made to beneficiaries up to the end of period 31.12.20__

Table 2

State of progress of the work for

National Programme 200 _- 200 _

Phase: _ Period from 1/_/_/200 _ to 1/_/_/200 _

Application No	Title	Implementation	Implementation rate	Remarks

ANNEX VI

Application for pre-financing**National Programme 200 _- 200 _****Phase: _ Period from 1/_ _/200 _ to 1/_ _/200 _**

Number of national programme:

Amount of the pre-financing requested: EUR

Bank details:

Name of the bank:

Address of branch/code:

Telephone/fax, telex, e-mail address:

Account No:

Account name:

Done at _____ Date: _____

For the competent body

(Signature and stamp)

Mr/Mrs/Ms (in printed letters):

ANNEX VII

Certificate for payment of the balance for

National Programme 200 _ - 200 _

Phase: _ Period from 1/_ _ /200 _ to 1/_ _ /200 _

Number of national programme:

Total payments made to date to the competent body on behalf of the Commission: EUR

Total payments made by the Commission: EUR

Amount of balance requested: EUR

The competent body, responsible for implementing the measures adopted pursuant to Regulation (EC) No2152/2003, hereby certifies that:

- (1) the work provided for by the scheme commenced on at the scheduled site;
- (2) the entire scheme was completed on ;
- (3) no support is requested for actions which were completed when the Commission decided upon the national programme.
- (4) no support is requested for actions supported through other Community funding or included in national/regional programmes under Council Regulation (EC) No 257/1999.
- (5) the actual costs of the eligible expenditure incurred by the competent body total ;
- (6) the above-mentioned costs are broken down by type of measure as specified in Table 3, annexed hereto;
- (7) it has been noted in the field that the work carried out is as specified in the dossier attached to the aid application on which the Commission decision was based;

(8) the amount of recoverable value-added tax included in the declared expenditure is ;

(9) Bank details:

Name of the bank:

Address of branch/code:

Telephone/fax, telex, e-mail address:

Account No:

Account name:

Done at _____ Date: _____

For the competent body

(Signature and stamp)

Mr/Mrs/Ms (in printed letters)

ANNEX VIII

Table 3

Revenue and expenditure balance sheet for**National Programme 200 _ - 200 _****Phase: _ Period from 1/_ _ /200 _ to 1/_ _ /200 _**

Request No	Requested Community contribution	Contribution by the competent body	Other public funding	Other private funding	Commercial revenues generated by the national programme
Total					

Table 4

Breakdown of costs for**National Programme 200 _ - 200 _****Phase: _ Period from 1/_ _ /200 _ to 1/_ _ /200 _**

(sorted by sub-type of activity)

Request No	Type of activity (A, B, C)	Sub-type of activity (1, 2, ...)	Costs	Remarks
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
			Total	

ANNEX IX

EVALUATIONS AND REVIEWS

Instruction for the *ex-ante* evaluation

The *ex-ante* evaluation exercise shall take into account the experience from the previous monitoring activities. An *ex-ante* evaluation is also designed to get potential risk factors and obstacles to implementation out into the open. It has to lay emphasis on technical and financial monitoring mechanism.

Furthermore the *ex-ante* exercise shall provide additional information needed by the Commission to look upon the proposals and to make a just and transparent decision on the financial contributions. In this regard, the evaluation work has to facilitate a constructive dialogue between the responsible bodies for the national programmes and the experts as well as the Commission.

Main elements to be tackled in the *ex-ante* evaluation

- (1) Short description of programme elements and definition of objective
- (2) Review of the national monitoring conception.
- (3) Priorities within the national programme.
- (4) Specific objective of the activities and results expected.
- (5) Intensity and periodicity of the data collection and analysis with short explanation.
- (6) National specifics and linkages to other monitoring activities or forest related inventories.
- (7) Short description of the situation concerning forest fire issues and main elements of the forest fire protection plans for the area concerned.

Midterm-Review/*Ex-post* evaluation

The mid-term review and the *ex-post* evaluation shall present the progress made and has to lay emphasis on the analysis of gaps and potentials.

Main elements to be tackled in the mid-term review and in the *ex-post* evaluation

	Mid-term	ex-post
Part A – Achievements and main findings	X	X
Part B – Evaluation of success and failure as well as of the efficiency	X	
1. Structure and organisation of the national monitoring programme		
2. Coherence of the Community scheme with the national monitoring scheme		
3. Evaluation of the programme elements		
Part C - Cost-benefit analysis	X	
Part D - Recommendations	X	
1. Recommendations as regards the Community scheme		
2. Recommendation as regards the national scheme		
Part E – Conclusions	X	X