Project no. 518128

EFORWOOD

Tools for Sustainability Impact Assessment

Instrument: IP

Thematic Priority: 6.3 Global Change and Ecosystems

Deliverable PD 2.0.4
Annual Progress Report Year 2
Module 2

Due date of deliverable: Month 24
Actual submission date: Month 26

Start date of project: 011105
Duration: 4 years

Organisation name of lead contractor for this deliverable:
Institut National de la Recherche Agronomique (INRA)

Final version

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

PD 2.0.4 ANNUAL PROGRESS REPORT YEAR 2
MODULE 2

Authors:

Carnus J-M[1], Cucchi V[1], Edwards, D [2], Jactel, H [1], Rasmussen, K [3], Spiecker, H[4], Tome, M[5]
([1]) INRA, France; ([2]) FR, United Kingdom; ([3]) KVL, Denmark; ([4]) ALUFR , Germany; ([5]) ISA, Portugal.

Abstract:

The PD2.0.4 Progress report of Module 2 contains an overview of the work conducted, of the main scientific achievements and of activities carried out by the Module partners during the second year of the project. It presents a detailed description of progress toward the objectives of the project and the milestones and deliverables; the identification of the problems encountered and corrective actions taken or proposed are also presented. All the work scheduled for Year 2 has been accomplished according to the management plan. Appendix 1 provides a detailed report from each Work-Package.

CONTENT

1. Project objectives and major achievements during year 2

1.1 M2 overall objectives and milestones

The general aim of Module 2 within EFORWOOD project is to improve knowledge, methods and tools to assess the sustainability of forests and raw material production in the context of present and future forestry-wood chains (FWCs). The overall objective of M2 is to make a **partial SIA of forest resource management** while providing M1 with relevant data and results on the way forest management affects SIA indicators.

M2 specific objectives are: (1) to assess the impacts of **forest management strategies** on the three pillars of sustainability; (2) to characterise **environmental, economic and social functions** of forests and their interaction with management options; (3) to evaluate main **biotic and abiotic risks**; (4) to improve **integrated predictive and monitoring tools** for sustainability assessment. Module 2 is organized in six work-packages. Main milestones and deliverables for the duration of the whole project include:

- Development of a **data platform** on reference forest types and management strategies;
- Provision of **state of the art and synthesis** reports on indicators for SIA of forest management;
- Development of databases, methodologies and **improved modelling tools** for indicator evaluation and partial SIA at various scales of the forestry component of FWCs;
- Preparation of **scientific publications** on interactions between management and forest functions and on improved SIA methodologies and tools within forest boundaries.

For the year 2 of the project, objectives and milestones are described in section 2 and appendix 1 for each work package.

1.2 Summary of Module 2 work

In the second year of the project, research activities have mainly involved:

(1) methodological development (framework of forest management alternatives (FMA), reviewing and developing protocols for sustainability indicator measurement, organising structure of the module database)

(2) descriptive work and data collection (mapping of FMAs and options for the different reference forests, definition of the forest-based case study for ToSIA, data collection for TOSIA single chains, description of available models and simulators)

(3) data analysis of main hazards and damages to EU forests

(4) state of the art and synthesis work (impacts of forest management on environmental services, and on key Social and Cultural Values).

During year 2 of the project, M2 work has mainly focused on:

(i)   **module coordination** including coordination between and within WP, and communicating with other modules and task forces (3 module meetings, 3 cross-module meetings, 4 MMT meetings, and 12 WP meetings);

(ii)   **data collection** for ToSIA (test and single chains) and for module database on reference forests;

(iii) **analysis and synthesis reports** on forest management alternatives, impacts of management alternatives on environmental services, prevalence of biotic and abiotic hazards, ability of forests models to estimate sustainability indicators.

Management and coordinating activities have been intensified to effectively integrate module work in the overall project through improved linkages with other modules (M1 and M3) and task forces, and to harmonize various tasks between work packages within the module.

Dissemination activities have been initiated in year 2 including publication of scientific articles (Poissonnet et al, 2007) and oral communications (Carnus et al., 2007; Edwards, 2007) and posters during conferences (IUFRO European Congress, Warsaw, Sept 2007, and EFORWOOD conference, Brussels, Oct 2007).

Main work achievements during year 2 include:

- framework and detailed description of FMAs and options for reference forests (8 coniferous and broadleaved species in 9 European regions)
- data platform and data set for reference forests generated
- data sets collected for 3 test and single chains (Scots pine in Sweden, spruce in Germany, eucalyptus in Portugal) to be used by TOSIA to evaluate a set of quantitative FWC sustainability indicators
- contribution to the protocols for measurement of FWC and SFM? sustainability indicators
- review and synthesis of impacts of forest management alternatives on environmental services and associated indicators
- synthesis of existing knowledge of key Social and Cultural Values (SCVs) and their indicators in the reference forests in ToSIA test chains and regional case studies
- analysis and synthesis of prevalence of main biotic and abiotic hazards in EU forests
- workshop on methodologies to improve existing models and simulators of forest resource management for use in SIA at regional and EU level

Key objectives for the second implementation period (months 13 to 30) included:

1. elaboration of forest management alternatives in relation to larger scenarios
2. guidelines for measurement of selected Forest Wood Chain (FWC) indicators and specific module indicators (SMI)
3. complete data collection for test and single chains and initiate data collection for case studies
4. develop response functions to forest management alternatives
5. regional simulation and large scale modelling
6. contribute to framework for data collection at national level.

During year 2 (months 13-24), objectives 1, 2 and 3 have been fulfilled, and objectives 4, 5 and 6 have been partially fulfilled. Section 2 presents detailed objectives and work achievements for each WP of Module2.

2. Work package progress in year 2

2.1 WP 2.0 Co-ordination

2.1.1 A description of progress toward the objectives of the project

The general objective of this work package is to ensure module objectives are fulfilled and deliverables provided according to time schedule through efficient co-ordination of module activities and interfaces with other modules and task forces. All of the 5 specific objectives of the second 18 months (Appendix 1) have been fulfilled totally (4 objectives) or partially (1 objective).

2.1.2 An overview of the activities carried out

During the second year, the activities of this WP included**:**

- module co-ordination activities with organisation of 6 module meetings as part of the EFORWOOD weeks (Lisbon, Nov 2006, Zvolen, May 2007, Brussels, October 2007) and Module Management Team (MMT) meetings during EFORWOOD weeks and in between (Vilanova, Feb 2007, Bordeaux, July 2007), as well as preparation of meeting minutes. WP 2.0 leader also participated in EU task force for data collection at EU level.

- linkages with other modules: (i) organisation of and participation in joint meetings with M1 and M3 during Eforwood weeks (2 joint M1-M2 meetings and 2 joint M2-M3 meetings); (ii) coordination of the forest-based case study (Scandinavian case study) and coordination of data collection for the 3 test / single chains for TOSIA; (iii) inputs through participation to three task forces (indicators, scenarios, EU forest wood chain); (iv) participation in overall IP co-ordination (11 Board meetings in year 2)

- reporting activities including (i) two reports have been produced in year 2 (report describing the forest-based case study delivered in month 23 (PD 2.0.3) and the annual progress report (PD 2.0.4)); an internal report has been produced also with M1 on specific module indicators for M2.; (ii) WP2.0 organised the review of all module deliverables during year 2.

2.1.3 Description of progress towards the milestones and deliverables foreseen

The four milestones (M2.0.6 to M.2.0.9) scheduled in year 2 have been reached and M2.0.10 will be reached in month 26 (instead of month 24). PD 2.0.3 report was approved in September 2007 (month 23) and PD 2.0.4 annual progress report of module 2 will be submitted in November 2007.

.

2.2 WP 2.1 Sustainable Forest Management Strategies

2.2.1 A description of progress toward the objectives of the project

The general objective of this work package is to characterise and analyse currently recommended and future forest management strategies for relevant forest types across Europe for the maintenance of sustainability and their impacts on the Forest-Wood Chain. All of the 3 specific objectives of the relevant 18 months (Appendix 1) have been partially fulfilled.

2.2.2 An overview of the activities carried out

During the second year of the project, this work-package (WP) organised with WP 2.0 the elaboration of a common definition of five forest management alternatives forming a gradient from no intervention to very intensive silvicultural operations (D2.1.3) and defined the corresponding management strategies for the main tree species in the regional cases. It organised collection of a set of relevant data for agreed reference forests and participated in the data platform development. It participated in discussion with WP2.5 on how to implement the computations in regional simulators.

Activities have included organisation of 4 specific WP meetings in second year (Eforwood weeks (11/2006 – 05/2007), and in Villanova (February 2007) and Bordeaux (July 2007).

2.2.3 Description of progress towards the milestones and deliverables foreseen

Both the second year project deliverables (D2.1.3 and PD2.1.4) have been reviewed and approved. The two milestones regarding data platform and set of future forest management alternatives are completed.

2.3 WP 2.2 Environmental services

2.3.1 A description of progress toward the objectives of the project

The objective of this work package is to evaluate environmental services from forests at local and regional scales and to provide quantitative environmental service indicators associated with forest management alternatives and future FWC scenarios. The following environmental services will be included: carbon sequestration, water quality and quantity, biodiversity, and maintenance of soil quality. All of the 5 specific objectives of the considered 18 months (Appendix 1) have been partially fulfilled.

2.3.2 An overview of the activities carried out

During the second year of the project, the main work for this workpackage has been finalisation of D.2.2.2 (Synthesis report on "Impact of forest management on environmental services"). It has also been involved in the group preparing the "Protocol on data collection –

Waste group", the "Environmental Indicator Group" and the work on description of Forest Management Alternatives.

Activities have included organisation of 2 specific WP meetings in second year (Lisbon, Zvolen) and participation in module meetings (Zvolen and Brussels Eforwood weeks).

2.3.3 Description of progress towards the milestones and deliverables foreseen

The D 2.2.2 Synthesis report on "Impact of forest management on environmental services" was delivered in month 18. The three milestones were fully or partially completed, fully for contribution to the definition of forest management alternatives, partially for the two others included in the synthesis report. Identification of knowledge gaps about the effect of management alternatives on environmental services will be further elaborated during the next 6 months.

2.4 WP 2.3 Social values

2.4.1 A description of progress toward the objectives of the project

The objective of this work-package is to collate information on the Social and Cultural Values (SCVs) which stakeholders attach to major European forest types and, by relating SCVs to existing criteria and indicators for sustainable management, to explore the sensitivity of SCVs to different forest management alternatives. This study is the first time that the interaction between SCV's and forest management has been explored over a range of major European forest types. This work provides a basis for refining the existing criteria and indicators of SCVs and so supports the implementation of resolution 3 of the 2003 Vienna MCPFE. All of the specific objectives of the second 18 months (Appendix 1) have been partially fulfilled (50 % overall completion).

2.4.2 An overview of the activities carried out

During the second year of the project, this work package worked on literature reviews of the availability of data and information on recreational use of forests in Europe, and the impacts of forest management on recreational use. It permitted a synthesis of existing knowledge of key SCVs and their indicators in the reference forests in ToSIA test chains and regional case studies, development of an analytical framework for compilation of existing data. The WP assisted also with data collection and determination of the impact of forest management alternatives on key SCV indicators with particular focus on reference forests in test chains and regional cases. WP 2.3 organised and participated in specific meetings, M2 meetings, and other relevant EFORWOOD meetings in Vilanova, Zvolen and Brussels. Meetings of WP2.3 was organised in Vilanova (Spain, Feb 07), Zvolen (Slovakia, May 07), Bordeaux (July 07) and Brussels (Oct 07).

2.4.3 Description of progress towards the milestones and deliverables foreseen

PD 2.3.2 "Report on existing knowledge of key SCVs associated with reference forests types" is planned to be submitted Month 25. This is a pilot study to determine availability of data and information and help develop the future research agenda.

2.4.4 The identification of the problems encountered and corrective action taken

Milestone M2.3.5 "Protocol prepared for valuation of SCV indicators in reference forests, and structure and content of SCV database agreed" was developed provisionally by Month 16, but will need further work as part of discussions with WP2.5 and other M2 work packages at the next M2 meeting in Lisbon February 2008. This is because the precise framework for assessing SCV indicators and incorporating them into models still needs to be decided. This deviation is not holding up any other part of the project. Submission of PD2.3.2 is being delayed by one month from Month 24 to 25.

2.5 WP 2.4 Risk assesment

2.5.1 A description of progress toward the objectives of the project

The objective of this work-package is to develop standardised tools at EU-level for the evaluation of damage at regional scale in order to provide quantitative indicators and to predict risks associated with forest management options. All of the 4 specific objectives (Appendix 1) of the 18 months have been partially fulfilled (10 to 90 % completion).

2.5.2 An overview of the activities carried out

During the second year, this work package discussed with WP2.1 to identify possible methodologies to test for effects of management alternatives on risks at the EU level, and with WP2.5 to understand expectations about data exchanges. WP2.4 partners have also collected available information about the effects of management operations and options on stand vulnerability to biotic and abiotic hazards, organised in a database (Endnote library, several hundred references). This information allowed preparation for texts about specific management operations and a synthesis report that will be delivered by the end of November 2007 and further submitted as a scientific review paper to the Annals of Forest Sciences.

WP 2.4 organised 2 WP meetings (Arcachon, March 07, and Solsona, Sept 2007), participated in three common meetings with other WPs (Vilanova/February 07, Bordeaux/July 07 and Solsona/September 07), and in all module and MMT meetings.

2.5.3 Description of progress towards the milestones and deliverables foreseen

The PD 2.4.2 "Report on intensity and occurrence of main hazards in reference forest tree species" was delivered in month 21, the D 2.4.3 "Publication on main factors of stand vulnerability to the key hazards " is in progress. Of the five milestones due before month 24, one was reached in time (M2.4.4), two were slightly delayed (M2.4.6 and M2.4.7) and two are not yet requested (M2.4.5 and M2.4.8) as the list of indicators is still pending.

2.5.4 The identification of the problems encountered and corrective action taken

Additional work is requested to provide inputs to the regional simulators developed by the WP2.5. All efforts will be made to meet these new expectations but we still need to work out the requirements. It has been proposed to test for the feasibility of such data provision by performing a pilot study in the Aquitaine (and possibly Portugal) regional cases.

2.6 WP 2.5 Integrated Modelling Tools

2.6.1 A description of progress toward the objectives of the project

The objective of this work-package is to provide the models and tools to estimate forest resource based sustainability indicators for current forest management strategies and future options that take multifunctional aspects into account and allow full chain analysis. This will be the first time that the impact of forest management will be evaluated at a panEU-scale through a set of selected indicators able to express multiple uses of different forest types. All of the specific objectives of the second 18 months period (Appendix 1) have been fulfilled partially in the second year and will be achieved by month 30 (April 2008) as planned.

2.6.2 An overview of the activities carried out

During the second year, this work-package developed a framework for the description of forest growth models and identified requirements and main improvements for existing forest growth models to provide sustainability indicators for ToSIA. A workshop on methodologies to improve these models was organised at Vilanova (Spain), February 2007. The WP started the research both to include the models into regional simulators that predict the future development of the forests in a region and forest growth prediction at the European scale. A workshop on methodologies to improve regional and European forest simulators to fulfil EFORWOOD needs was organised in September 2007 at Solsona (Spain).

During the second year, WP 2.5 organised two WP meetings (Vilanova, 02/07, and Solsona, 09/07) in combination with WP2.1 and WP2.4 respectively, and participated in all module and MMT meetings

2.6.3 Description of progress towards the milestones and deliverables foreseen

PD2.5.2 on "Description of models currently available and identification of their ability to estimate sustainability indicators" was delivered at Month 21. PD2.5.3 on "Report of workshop on methodologies to extend models for forest sustainability analysis" is now finalised and will be delivered in Month 25. The milestone (workshop on Methodologies to improve existing models for forest sustainability analysis) was reached at the Vilanova workshop in Month 16.

REFERENCES

Carnus J-M, Jactel H, Vodde F, 2007. Risk analysis in Sustainability Impact Assessment (SIA) of Forest Resource Management. Oral presentation at EFORWOOD conference, "The Forest-Based sector - Sustainability for Competitiveness", Brussels, Octobre 2007. ARNUS

Carnus, J-M, Poissonnet, M, 2006. SFM indicators in the context of Sustainability Impact Assessment of Foretry Wood Chains. Oral communication to IUFRO Conference on SFM indicators, Porto, Decembre 2006. IEFC.

Edwards, D, 2007. Capturing the social and cultural values of European forests: insights from Eforwood. Oral communication to IUFRO European Congress, Warsaw , 2007

Poissonnet, M, Cucchi, V, Carnus, J-M, 2007. EFORWOOD: un projet de recherche pour évaluer la performance de la filière forêt-bois au regard du développement durable. Revue Forestière Française (*ir press*)

Appendix 1: WP-reports for month 13-24

Annual report year 2
Period: November 1, 2006 - October 31, 2007

WP 2.0 - Co-ordination
Period: November 1, 2006 - October 31, 2007

WP leader	Jean-Michel Carnus		WP number	2.0
Work package objectives				

The objective of this work package is to ensure module objectives are fulfilled and deliverables provided according to time schedule through efficient co-ordination of module activities and interfaces with other modules. Specific objectives for the period 13 -30 month (1 November 2006 to 30 April 2008) include:

1. to coordinate module management team and WP teams and organise MMT and module meetings
2. to finalise list of specific module indicators for partial SIA in connection with Ml
3. to contribute to cross-module training for SIA methods and tools
4. to coordinate data collection for regional and national levels and monitor data supply to other modules
5. to review deliverables and compile elements for annual report

Progress towards objectives.

The planned five WP objectives described above have been fulfilled totally (1,2,4,5) or partially (3) during year 2 of the project. Objective 3 will be completed by contribution of WP 2.0 in Eforwood cross module training planned in month 25 (data collection for SIA indicator evaluation).

Co-ordination (*partner INRA*) of WPs: this task was completed successfully and included organisation of 6 module meetings as part of the EFORWOOD weeks (Lisbon, Nov 2006, Zvolen, May 2007, Brussels, Octobre 2007) and Module Management Team (MMT) meetings during EFORWOOD weeks and in between (Vilanova, Feb 2007, Bordeaux, July 2007), as well as preparation of meeting minutes. WP 2.0 leader participates in EU task force for data collection at EU level.

Interface management with other modules: progress has been made including (i) organisation and participation to joint meetings with M1 and M3 during Eforwood weeks (2 joint M1-M2 meetings and 2 joint M2-M3 meetings) (*all partners from WP 2.*0) ; (ii) coordination of the forest-based case study (Scandinavian case study) and coordination of data collection for the 3 test / single chains for TOSIA (*partners ALUFR, ISA, SLU*) ; (iii) inputs through participation to three task forces (indicators, scenarios, EU forest wood chain) (*partners INRA, ISA, FR, UCPH*); (iv) participation in overall IP co-ordination (11 Board meetings in year 2).(*partner INRA*)

Reporting: this task was completed: (i) two reports have been produced in year 2 including report describing the forest-based case study delivered in month 23 (PD 2.0.3) *(partner SLU)* and the annual progress report which is currently being prepared for month 25 (PD 2.0.4) (*all partners*).An internal report has been produced also with M1 on specific module indicators for M2.; (ii) WP2.0 organised the review of all module deliverables during year 2 (*partner INRA*).

Deviations from workprogramme (if any) , corrective actions taken, nature and reason for problem, contractors involved.
no deviation

Table 1: List of Deliverables during the period November 1, 2006 – October 31, 2007

List all deliverables, giving date of submission and any proposed revision to plans.

Del No.	Deliverable name	WP No.	Due date	Actual/ Forecast delivery date	Estimated indicative person- months *)	Used indicative person- months *)	Lead contra ctor
PD 2.0.3	Report describing the forest-based case study	2.0	Month 20	Month 23			SLU
PD2.0.4	Annual progress report	2.0	Month 24	Month 25			INRA

*) if available

Table 2. List of Milestones during the period November 1, 2006 – October 31, 2007

List all milestones, giving date of achievement and any proposed revision to plans.

Milestone No.	Milestone name	Workpackage No.	Date due	Actual/Forecast delivery date	Lead contractor
M2.0.6	Module and MMT meetings	2.0	Months 13, 16, 19, 21, 24	Months 13, 16, 19, 21, 24	INRA
M2.0.7	Set of specific module indicators	2.0	Month 18	Month 18	INRA
M2.0.8	Information package on reference forests	2.0	Month 18	Month 24	INRA
M2.0.9	Description of forest based case study	2.0	Month 20	Month 23	SLU
M2.0.10	Framework for data collection at national level	2.0	Month 24	Month 26	EFI (M1) (INRA-M2)

WP 2.1 - Sustainable Forest Management Strategies
Period: November 1, 2006 - October 31, 2007

WP leader	Prof. Dr. Heinrich Spiecker (ALUFR)	WP number	2.1

Work package objectives	Achievement of the objective
The overall objective: Characterisation and analysis of currently recommended and future forest management strategies for relevant forest types across Europe for the maintenance of sustainability and their impacts on the Forest-Wood Chain	In progress
The specific objectives: 1. Finalise the description of processes at different stages of forest production and for various management alternatives and options emphasizing on wood and biomass production, and in liaison with WP2.2, WP2.3 and WP2.4 for environmental services and multifunctional forestry.	In progress
2. Provide data for reference forest types and key indicators on wood production and related economic parameters to be used for test chains and regional case studies, collected in the generated data platform.	data collection for test chains: done … for regional case studies: In progress
3. Proceed in analysing impacts of current and future forest management alternatives on wood resources quantity and quality in close relation with WP 2.5 and Module 3. Due to the high difference of systems, this analysis will be done on a regional basis.	In progress (~75%)

Progress towards objectives, tasks worked on, achievements made with reference to planned objectives, contractors involved.

- **Description of forest production processes**

WP2.1 described possible operational processes at different stages of forest production (PD2.1.1). Those have been used to describe the currently recommended forest management strategies for the considered main tree species in the various European regions (PD2.1.2). In addition a common definition of five forest management alternatives forming a gradient from no intervention to very intensive silvicultural operations is elaborated (D2.1.3). Based on this definition, corresponding management strategies for the main tree species in the regional cases are being defined using a standardized scheme (PD2.1.1) for describing the strategies.

- **Setting up data platform reference forest types and data collection**

A common set of relevant data to be collected for description of reference forest types is defined. A data platform is developed and now being used to collect the relevant data in the regions (PD2.1.4). The data collection for describing the reference forest types based on National Forest Inventories at reference year 2005 is completed. The data for the single embedded FWC is completed as well and has started for the regional case studies.

- **Impact analysis of forest management alternatives**

The general procedure for the impact analysis is outlined and it has been discussed with WP2.5 how to implement the computations in regional simulators.

Tasks worked on	Percentage of progress	Contractors involved
PD2.1.2: Review report on current forest management strategies: characterisation of current forest management strategies by using the same standardized sets of variables	100%	All partners in WP2.1
D2.1.3: Definition of Forest Management Alternatives	100%	All partners in WP2.1
PD2.1.4: Data platform and data set for reference forest types	In review	All partners in WP2.1
Set up of data platform and data set design for describing reference forest types generated	100%	ALUFR, INRA
Set up of future forest management options (Forest Management alternatives (**FMA's**))	100%	All partners in WP 2.1 in cooperation with WP2.2, WP2.3, WP2.4 and WP2.5
Data set of Regional FWC in case studies and regional forest cases	75% (current situation done)	All partners in WP2.1
Design of cross-analysis and common improvement of forest management alternatives emphasizing environmental services and multifunctional forestry (social aspects) in close interaction with WP's 2.2, 2.3 and 2.4 which will have contributed to the development of those alternatives.	75%	All partners in WP 2.1 in cooperation with WP2.2, WP2.3, WP2.4 and WP2.5
2 meetings on Forest Management Alternatives (Spring Villanova/Spain; Fall Bordeaux/France) with all WP2.1, other WPs in M2 and some colleagues from M1. Goal to develop the alternatives and to make sure that M2 goals and M1 goals are compatible, as well as to improve usability of results in ToSIA.	100%	All partners in WP2.1, WP and M2 leaders, M1 representatives

Deviations from workprogramme (if any), corrective actions taken, nature and reason for problem, contractors involved.

No deviation from workprogramme

Table 1. List of Deliverables during the period November 1, 2006 – October 31, 2007

List all deliverables, giving date of submission and any proposed revision to plans.

Del No.	Deliverable name	WP No.	Due date	Actual/ Forecast delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contractor
D 2.1.3	Definition of future forest management alternatives: report identifying and describing future production processes and options on various sites for reference forest types	2.1	Month 20	Month 20 (in review) Month 24 done			ALUFR
PD 2.1.4	Report on data platform and data set for reference forest types.	2.1	Month 24	Month 24			ALUFR

Table 2. List of Milestones during the period November 1, 2006 – October 31, 2007

List all milestones, giving date of achievement and any proposed revision to plans.

Milestone No.	Milestone name	WP No.	Date due	Actual/Forecast delivery date	Lead contractor
M2.1.5	Data platform and data set design for describing reference forest types generated	2.1	Month 18	Month 18	ALUFR
M2.1.6	Set of future forest management options	2.1	Month18	Month 18	ALUFR

WP 2.2 - Environmental services
Period: November 1, 2006 - October 31, 2007

WP leader	**Karsten Raulund Rasmussen**	**WP number**	**2.2**

Work package objectives.

The **general objectives** are to evaluate environmental services from forests at local and regional scales and to provide quantitative environmental service indicators associated with forest management alternatives and future FWC scenarios. The following environmental services will be included: carbon sequestration, water quality and quantity, biodiversity, and maintenance of soil quality.

The **specific objectives** of this work package for the 13th to 30th months are:
- to organise the information flow with related WPs in module 2
- to publish available knowledge for the environmental services
- to provide specific information for the target groups and inputs into modelling activities (mainly WP2.5 and M1)
- to make syntheses of existing knowledge and identify knowledge gaps
- to make plans for in depth analyses to take place later in the project.

Progress towards objectives

The main work for wp2.2 during the period 13th-24th month has been finalisation of D.2.2.2 (Synthesis report on "Impact of forest management on environmental services"). The report is quite comprehensive including 125 pages and around 600 references and including identification of knowledge gaps. During the period we have also been involved in the group preparing the "Protocol on data collection – Waste group", the "Environmental Indicator Group" and the work on description of Forest Management Alternatives. The information flow in the work package is evaluated as satisfactory. The task regarding information for modelling activities is planned for the next half year. Likewise the in-depth analyses will be on the agenda for the next meeting in the work-package.

Deviations from workprogramme (if any), corrective actions taken, nature and reason for problem, contractors involved.

A specific appointment between wp-leaders from wp 2.2 and wp 2.5 is arranged to discuss input from wp2.2 to the modelling process.

Table 1. List of Deliverables during the period November 1, 2006 – October 31, 2007

List all deliverables, giving date of submission and any proposed revision to plans.

Del No.	Deliverable name	WP No.	Due date	Actual/ Forecast delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contr actor
D 2.2.2	Synthesis report on "Impact of forest management on environmental services"	2.2	Month 18	Month 18		The estimate is not available. A rough guess would be around 14 man months	KVL/ KU

*) if available

Table 2. List of Milestones during the period November 1, 2006 – October 31, 2007

List all milestones, giving date of achievement and any proposed revision to plans.

Milestone No.	Milestone name	Workpackage No.	Date due	Actual/Forecast delivery date	Lead contractor
M2.2.3	Meta database for each of the environmental services	2.2	Month 16	included in the synthesis report	KVL/KU
M2.2.4	Contribution to the definition of alternative forest management strategies to be studied in reference forests.	2.2	Month 16	done	KVL/KU
M2.2.5	Identification of knowledge gaps about the effect of management alternatives on environmental services and plan for in depth analyses	2.2	Month 24	partly included in the synthesis report. Will be further elaborated during the next 6 months.	KVL/KU

WP 2.3 - Social values
Period: November 1, 2006 - October 31, 2007

WP leader	David Edwards		WP number	2.3

Work package objectives

Overall objective:

The objective of this work package is to collate information on Social and Cultural Values (SCVs) which stakeholders attach to major European forest types and, by relating SCVs to existing criteria and indicators for sustainable management, to explore the sensitivity of SCVs to different forest management alternatives.

The **specific objectives** of Months 13-30 are :

- to maintain the information flow with related WPs in Module 2
- to synthesise existing knowledge of key SCVs and their indicators in the reference forests in ToSIA test chains and regional case studies
- to develop an analytical framework for compilation of existing data, and assist with data collection
- to determine the impact of forest management alternatives on key SCV indicators with particular focus on reference forests in test chains and regional cases.

Progress towards objectives.

To maintain the information flow with related WPs in Module 2

Meetings of WP2.3 in Vilanova (Spain, Feb 07), Zvolen (Slovakia, May 07), Bordeaux (July 07) and Brussels (Oct 07).

WP2.3 Progress report, July 2007.

Regular inter-WP communication within FR and beyond.

IUFRO conference presentation, Warsaw, September 2007.

To synthesise existing knowledge of key SCVs and their indicators in the reference forests in ToSIA test chains and regional case studies

Work towards PD2.3.2: "Report on existing knowledge of key SCVs associated with reference forests types" This is a pilot study to determine availability of data and information and help develop the future research agenda. The main tasks were as follows:

Collaboration with COST E33 on forest recreation; meeting with Jeofrey Dehez, leader of Working Group 2, Bordeaux, to begin sharing information on national recreation inventory data and discussing proposals for collaboration

Correspondence with COST E33 and EFORWOOD partners in Europe to obtain information and begin preparing country profiles and to extend the network of researchers that will be used for subsequent expert consultations in WP2.3.

Literature review and web-search on aspects of forest recreation across Europe.

To develop an analytical framework for compilation of existing data, and assist with data collection

And

To determine the impact of forest management alternatives on key SCV indicators with particular focus on reference forests in test chains and regional cases

Ongoing literature review on public preferences, economic valuation, and modelling demand for forest recreation in Europe to help develop a framework for analysis for modelling purposes within WP2.5 based on the range of forest management factors that may influence recreational use.

Regular discussion at M2 meetings to determine suitability of approach being adopted.

Additional work by INRA/LEF to determine levels of recreational use and economic values in Lorraine and Aquitaine, two of the nine case studies adopted by M2.

Additional work by FR in the Scottish Borders case study of M2 to model current use of Craik Forest and to begin modelling impacts of changes to forest management

Deviations from workprogramme

Milestone M2.3.5 "Protocol prepared for valuation of SCV indicators in reference forests, and structure and content of SCV database agreed" was developed provisionally by Month 16, but will need further work as part of discussions with WP2.5 and other M2 work packages at the next M2 meeting in Lisbon February 2008. This is because the precise framework for assessing SCV indicators and incorporating them into models still needs to be decided. This deviation is not holding up any other part of the project.

Submission of PD2.3.2 is being delayed by one month from Month 24 to 25. This is because the FR Social and Economic Research Group has suffered staff shortages throughout 2007. A new researcher, Dr Mariella Marzano will start work in mid-November 2007 and will work primarily on EFORWOOD for the remainder of the project, which will fully resolve this problem within WP2.3.

Table 1. List of Deliverables during the period November 1, 2006 – October 31, 2007

List all deliverables, giving date of submission and any proposed revision to plans.

Del No.	Deliverable name	WP No.	Due date	Actual/ Forecast delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contractor
PD2.3.2	Report on existing knowledge of key social and cultural values associated with reference forest types	2.3	Month 24	Month 25	4	4	FR

*) if available

Table 2. List of Milestones during the period November 1, 2006 – October 31, 2007

List all milestones, giving date of achievement and any proposed revision to plans.

Milestone No.	Milestone name	Workpackage No.	Date due	Actual/Forecast delivery date	Lead contractor
M2.3.3	Contribution to the definition of forest management alternatives and options to be studied in reference forests	2.3	Month 16	Month 16	FR
M2.3.4	Identification of SCVs sensitive to forest management for future analysis	2.3	Month 16	Month 16	FR
M2.3.5	Protocol prepared for valuation of SCV indicators in reference forests, and structure and content of SCV database agreed	2.3	Month 18	Month 16	FR
M2.3.6	Collection of information on current status of SCV indicators in reference forests	2.3	Month 24	Month 25	FR

WP 2.4 - Risk Assessment
Period: November 1, 2006 - October 31, 2007

WP leader	Hervé Jactel	WP number	2.4

Work package objectives

The **general objectives** are to develop standardised tools at EU-level for the prediction of forest damage in order to provide quantitative indicators and to forecast risks associated with forest management alternatives and options.

The **specific objectives** of this work package for the next 18 months are to:

- maintain the information flow with related WPs in module 2
- review, collect and assemble the available knowledge at EU scale for each task of WP2.4
- identify gaps in knowledge and requirements for additional data collection in order to improve the evaluation, and prediction of risks in reference forests including test chains and FWC case studies forests
- ensure valuable comparison across tree species, and reference forests using designed common data collection procedures

Progress towards objectives.

1. Participation in three common meetings with other WPs in module 2: with the WP21 in Vilanova on February 07 and in Bordeaux on July 07 to discuss about new management alternatives and possible methodology to test for their effect on risks at the EU level, in Solsona on September 07 with the WP25 to confront our expectations towards data exchanges

2. The available information about the effects of management operations and options on stand vulnerability to biotic and abiotic hazards has been collected, entered in database (Endnote library, several hundreds of references), and dispatched among the WP24 partners. Each of them has drafted a text about one specific management operation. These texts are currently gathered to form a synthesis report. It will be sent as a deliverable by the end of Novembre 07 and further submitted as a scientific review paper to the Annals of Forest Sciences.

3. The methodology to perform risk analyses relevant to the Eforwood objectives has been discussed. Two types of risks analyses will be developed in order to test for the effect of the 5 alternative forest managements (has defined by the Module 2) on risk for the health of European forest. A coarse grain analysis will be performed using the Multi Criteria Analysis approach for each of the Eforwood regional cases and integrating all types of hazards (and possibly socio-economic criteria). Fine grain analyses, hazard-specific, will be performed in the relevant regional cases. The diversity and the replication of the hazard-specific analyses will ensure the delivery of generic outcomes.

4. Each partner will explore the feasibility and the methodology to perform risk analyses in their respective regional case. The refinement of the methodology to ensure valuable comparison across reference forests will be completed during the next meeting of our work package in May 08 at the Eforwood week in Vienna.

Deviations from workprogramme (if any),

Additional work is requested to provide inputs to the regional simulators developed by the WP25. All

efforts will be made to meet these new expectations but we still need to work out the requirements. It has been proposed to test for the feasibility of such data provision by performing a pilot study in the Aquitaine (and possibly Portugal) regional case.

Table 1. List of Deliverables during the period November 1, 2006 – October 31, 2007

List all deliverables, giving date of submission and any proposed revision to plans.

Del No.	Deliverable name	WP No.	Due date	Actual/ Forecast delivery date	Estimated indicative person- months *)	Used indicative person- months *)	Lead contra ctor
PD.2.4.2	Report on intensity and occurrence of main hazards in reference forest tree species	2.4	Month 18	Month 21			INRA
D.2.4.3.	Publication on main factors of stand vulnerability to the key hazards	2.4	Month 24	Month 25			INRA

*) if available

Table 2. List of Milestones during the period November 1, 2006 – October 31, 2007

List all milestones, giving date of achievement and any proposed revision to plans.

Milestone No.	Milestone name	WP No.	Date due	Actual/Forecast delivery date	Lead contractor
M2.4.4	Contribution to the definition of future forest management alternatives to be studied in reference forests.	2.4	Month 16	Month 16 to Month 21	INRA
M2.4.5	Damage indicator data for test chains forests	2.4	Month 16	not yet requested	INRA
M2.4.6	Meeting to identify knowledge gaps about the effect of new silvicultural practices on stand vulnerability and proposal to fill them up	2.4	Month 18	Month 23 (Solsona meeting)	INRA
M2.4.7	initiate data collection on the effect of main damage on loss in wood volume and quality	2.4	Month 20	Month 21	INRA
M2.4.8	Damage indicator data for case studies forests	2.4	Month 24	not yet requested in the list..	INRA

WP 2.5 - Integrated Modelling Tools
Period: November 1, 2006 - October 31, 2007

WP leader	Margarida Tomé		WP number	2.5

Work package objectives

<u>Overall objective:</u> to provide the models and tools to estimate forest resources sustainability indicators for current forest management strategies and future options that take multifunctional aspects into account and allow full chain analysis

<u>Specific objectives for the period 13-30 months:</u>

1) Description of the models currently available and identification of their ability to estimate sustainability indicators

2) To organize a workshop to discuss the methodologies to improve existing models

3) To improve the models currently available in order to be able to estimate as many indicators of sustainability as possible

4) To start the development of the regional simulators in order to have the first prototypes by month 30

5) To start the development of a new European simulator (EFISCEN-space) in order to have a first prototype by month 30

Progress towards objectives

.

<u>Achievements:</u>

1) Project deliverable PD2.5.2 presents a framework for the description of forest growth models that gave impetus to the development of the database FORMODELS, available through internet, which will be a milestone for the next 18 months (Partners involved: mainly ISA and INRA, with contribution from other partners)

2) The workshop on "Methodologies to improve existing models for forest sustainability analysis" took place in Vilanova/Barcelona on month 16 and a report describing the discussions held and respective conclusions has been produced as PD2.5.3 (final version on month 25) (Partners involved: ISA, KVL, INRA, ALFUR, AFOCEL, CTFC, SLU, ALTERRA, FR)

3) Models are being improved both for the regional simulators and the European simulator; main improvements needed: add prediction equations for biomass/carbon estimation; develop algorithms for the transition from even-aged pure stands to more complex forests (Partners involved: all WP2.5 partners + FR)

4) The research to include the forest growth models into regional simulators that predict the future development of the forests in a region and estimate the associated indicators of sustainability has started – a project deliverable (PD2.5.4) will describe the improvements needed in each one of the models that will be used in the regional simulators (month 28) (Partners involved: all WP2.5 partners + FR)

5) The research to improve forest growth prediction at the European scale has also started – a project deliverable (PD2.5.5) will describe this work (month 28) (Partners involved:

	ALTERRA)
Deviations from workprogramme (if any)	
No important deviations were detected, even though the final versions of the deliverables has been finished after the date previously previewed.	

Table 1. List of Deliverables during the period November 1, 2006 – October 31, 2007

List all deliverables, giving date of submission and any proposed revision to plans.

Del No.	Deliverable name	WP No.	Due date	Actual/ Forecast delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contra ctor
PD.2.5.2	Description of models currently available and identification of their ability to estimate sustainability indicators	2.5	Month 18	Month 21			ISA
PD 2.5.3	Report of workshop on "Methodologies to extend models for forest sustainability analysis"	2.5	Month 20	Month 25			ISA

*) if available

Table 2. List of Milestones during the period November 1, 2006 – October 31, 2007

List all milestones, giving date of achievement and any proposed revision to plans.

Milestone No.	Milestone name	WP No.	Date due	Actual/Forecast delivery date	Lead contractor
M2.5.2	Workshop on "Methodologies to improve existing models for forest sustainability analysis at different temporal and spatial scales"	2.5	Month 16	Month 16	ISA

Appendix 2: List of deliverables

Table 1. List of Deliverables during the period November 1, 2006 – October 31, 2007

List all deliverables, giving date of submission and any proposed revision to plans.

Del No.	Deliverable name	WP No.	Due date	Actual/ Forecast delivery date	Estimated indicative person-months *)	Used indicative person-months *)	Lead contractor
PD 2.0.3	Report describing the forest-based case study	2.0	Month 20	Month 23			SLU
PD2.0.4	Annual progress report	2.0	Month 24	Month 25			INRA
D 2.1.3	Definition of future forest management alternatives: report identifying and describing future production processes and options on various sites for reference forest types	2.1	Month 20	Month 20 (in review) Month 24 done			ALUFR
PD 2.1.4	Report on data platform and data set for reference forest types.	2.1	Month 24	Month 24			ALUFR
D 2.2.2	Synthesis report on "Impact of forest management on environmental services"	2.2	Month 18	Month 18		The estimate is not available. A rough guess would be around 14 man months	KVL/KU
PD2.3.2	Report on existing knowledge of key social and cultural values associated with reference forest types	2.3	Month 24	Month 25	4	4	FR
PD.2.4.2	Report on intensity and occurrence of main hazards in reference forest tree species	2.4	Month 18	Month 21			INRA
D.2.4.3.	Publication on main factors of stand vulnerability to the key hazards	2.4	Month 24	Month 25			INRA

PD.2.5.2	Description of models currently available and identification of their ability to estimate sustainability indicators	2.5	Month 18	Month 21			ISA
PD 2.5.3	Report of workshop on "Methodologies to extend models for forest sustainability analysis"	2.5	Month 20	Month 25			ISA

*) if available

Appendix 3: List of milestones

Table 1. List of Milestones during the period November 1, 2006 – October 31, 2007

List all milestones, giving date of achievement and any proposed revision to plans.

Milestone No.	Milestone name	Workpackage No.	Date due	Actual/Forecast delivery date	Lead contractor
M2.0.6	Module and MMT meetings	2.0	Months 13, 16, 19, 21, 24	Months 13, 16, 19, 21, 24	INRA
M2.0.7	Set of specific module indicators	2.0	Month 18	Month 18	INRA
M2.0.8	Information package on reference forests	2.0	Month 18	Month 24	INRA
M2.0.9	Description of forest based case study	2.0	Month 20	Month 23	SLU
M2.0.10	Framework for data collection at national level	2.0	Month 24	Month 26	EFI (M1) (INRA-M2)
M2.1.5	Data platform and data set design for describing reference forest types generated	2.1	Month 18	Month 18	ALUFR
M2.1.6	Set of future forest management options	2.1	Month18	Month 18	ALUFR
M2.2.3	Meta database for each of the environmental services	2.2	Month 16	included in the synthesis report	KVL/KU
M2.2.4	Contribution to the definition of alternative forest management strategies to be studied in reference forests.	2.2	Month 16	done	KVL/KU
M2.2.5	Identification of knowledge gaps about the effect of management alternatives on environmental services and plan for in depth analyses	2.2	Month 24	partly included in the synthesis report. Will be further elaborated during the next 6 months.	KVL/KU
M2.3.3	Contribution to the definition of forest management alternatives and options to be studied in reference forests	2.3	Month 16	Month 16	FR
M2.3.4	Identification of SCVs sensitive to foerst management for future analysis	2.3	Month 16	Month 16	FR

M2.3.5	Protocol prepared for valuation of SCV indicators in reference forests, and structure and content of SCV database agreed	2.3	Month 18	Month 16	FR
M2.3.6	Collection of information on current status of SCV indicators in reference forests	2.3	Month 24	Month 25	FR
M2.4.4	Contribution to the definition of future forest management alternatives to be studied in reference forests.	2.4	Month 16	Month 16 to Month 21	INRA
M2.4.5	Damage indicator data for test chains forests	2.4	Month 16	Not yet requested,	INRA
M2.4.6	Meeting to identify knowledge gaps about the effect of new silvicultural practices on stand vulnerability and proposal to fill them up	2.4	Month 18	Month 23 (Solsona meeting)	INRA
M2.4.7	initiate data collection on the effect of main damage on loss in wood volume and quality	2.4	Month 20	Month 21	INRA
M2.4.8	Damage indicator data for case studies forests	2.4	Month 24	Not yet requested,	INRA
M2.5.2	Workshop on "Methodologies to improve existing models for forest sustainability analysis at different temporal and spatial scales"	2.5	Month 16	Month 16	ISA