

EFORWOOD
Tools for Sustainability Impact Assessment

**Report on existing knowledge on key social and cultural values
associated with reference forest types**

David Edwards, Mariella Marzano and Frank S. Jensen



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Preface

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

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

Uppsala in November 2010

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EFORWOOD

Sustainability Impact Assessment
of the Forestry - Wood Chain



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Deliverable PD 2.3.2
Report on Existing Knowledge of Key Social and Cultural Values
Associated with Reference Forest Types

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ABSTRACT

This report brings together available data and other information on social and cultural values associated with public use of forests in different European countries. The focus is on quantification and description of recreational use of forests in the nine reference forest regions selected by Module 2 of EFORWOOD. Conclusions are made regarding key findings and gaps that need to be filled to support research by WP2.3 into the impacts of forest management alternatives on recreational use of forests across Europe.

Key words: Forests, recreational use, social and cultural values, reference regions, visitor numbers

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BACKGROUND

Overview of the report

This report provides a synthesis of available information on the recreational use of forests across Europe. In the next section we provide a pan-European overview of levels of recreational use in different member states. We then consider each Module 2 Reference Region, in turn, and their respective countries, and present additional data and information on forest recreation, drawn largely from internet searches and consultations with EFORWOOD partners and professional contacts. Finally, we make conclusions on the nature of the information generated, and the gaps in our current knowledge that need to be filled to support subsequent research in WP2.3 into the impacts of forest management on recreational use. We begin by providing some relevant background information and briefly exploring what ‘recreation within forests’ means and how it is variously defined.

Background to EFORWOOD and WP2.3

EFORWOOD aims to develop Tools for Sustainability Impact Assessment (ToSIA), which will assist policymakers and other stakeholders to assess the impacts of policy changes, technical innovations, and other drivers on the sustainability of the forestry wood chain (for more information see: <http://www.eforwood.com>). The project is organised into six Modules, and numerous Work Packages. Module 2 focuses on the forest management part of the chain with emphasis on the 8 most important tree species for wood production in Europe, and 9 “Reference Forest” Regions located in eight countries being used to provide reference data for the different WP’s in M2. The “Reference Forest” regions are as follows (see Carnus *et al.* (2007) for a description and map of each region):

1. Aquitaine (south-west France)
2. An alpine region in Austria
3. Baden-Württemberg (Germany)
4. Catalonia (Spain)
5. Lorraine (eastern France)
6. A region covering roughly the western half of Portugal
7. The whole of Scotland
8. Silesia (Poland)
9. Västerbotten (Sweden)

Within Module 2, Work Package 2.3 focuses on ‘Social and Cultural Values’ (SCVs). During 2006, a comprehensive review was carried out by WP2.3 of the SCVs associated with forests in Europe (Edwards 2006). This was used to develop a generic template of SCVs and indicators based on nine themes (or criteria), 42 sub-themes and 72 indicators. The nine themes were as follows:

1. employment,
2. harvesting (NTFPs),
3. governance,
4. community development,
5. recreation and tourism,
6. education and learning,
7. health and wellbeing,
8. landscape and aesthetics,
9. culture and heritage.

Five indicators were selected for further research within WP2.3: employment, wages and salaries, occupational safety and health, education and training, and recreational use. The indicator ‘recreational use’ was chosen as the primary focus of the research within WP2.3, with the overall aim being to develop methods and tools to assess the impacts of forest management alternatives on recreation.

By assessing recreational use we consider all the ‘direct use’ values that people attach to forests, covering all nine themes listed above with the exception of ‘employment’, and ‘harvesting’. However, ‘recreational use’ fails to capture those ‘non-use’ values that people attach to the existence of forests. It also fails to capture use values associated with seeing trees and woodlands in the landscape but not actually visiting the woodlands themselves (a value which probably belongs under the theme ‘landscape and aesthetics’). Nevertheless, to incorporate recreational use into impact assessment procedures and tools such as ToSIA would be a major step towards a ‘Three Pillars’ approach to sustainability assessment that includes the economic, social and environmental values or functions of ecosystems. To date, treatment of social values is restricted to employment-related values, which excludes the benefits of forests thought to be derived by the majority of the European public.

In July 2007 a WP2.3 Briefing Report highlighted the importance of broadening the definition of forest management within Module 2 to include non-silvicultural variables that operate at both the stand but also landscape level (e.g. overall forest design). For example, in addition to silvicultural changes that enhance the visual amenity of a forest, recreational-related interventions could include:

- On-site infrastructure (such as trails, visitor centres, car parks, etc)
- On-site services (such as rangers leading nature walks, events, café facilities)
- Communication and promotion (including encouraging public consultation and participation)

While this decision does not affect the scope of information on recreational use presented here, it will be relevant when we seek to determine impacts of changes to forest management on recreational use.

Definitions of recreational use and scope of the report

Forest recreational use, in its broadest sense, generally implies visits to forests by members of the public during their spare time. It encompasses a wide range of activities, from walking and picnicking to more specialised sporting activities such as mountain-biking and hunting or the harvesting of NTFPs like mushrooms or berries. The range of recreational activities differs across Europe, depending on the type of forest as well as predominant social and cultural traditions. As Sievänen *et al.* (2007) point out, “In some countries recreational activities such as seasonal collections of berries and mushrooms have always been an integral part of rural life. Visits by urban people to forests for walking and picnicking also have a long tradition. Living or spending extended amounts of time in second homes located close to nature is a growing phenomenon all over the Europe today”.

There are difficulties in providing an overall definition of recreation and in being able to quantify and compare the levels of recreational use in forests on a pan-European scale. Dehez *et al.* (2007) identify three characteristics which tend to vary between different definitions of recreation. These are:

- Type of natural space
- Range of activities
- Duration of the stay

The authors highlight how ‘type of natural space’ is likely to be different within and between countries, making any international comparison difficult. Moreover, ‘woods’, ‘woodlands’ and ‘forests’ are likely to be perceived or imagined differently by different people in different circumstances. Even where some national surveys have provided a clear definition of a ‘forest’, this may not resonate with the experiences of individuals and groups taking part. The UK Forestry Commission (FC) carries out regular Public Opinion of Forestry household surveys to estimate numbers of visits to forests, yet a recent survey carried out by Forest Research (FR) in Scotland generated much higher estimates for numbers of visits (Hislop *et al.* 2007). One likely explanation for the different estimates is that FR provided a very broad definition of forests and woodlands, to include patches of trees in local green spaces, whereas FC did not define forests at all, which may have caused a larger proportion of respondents to discount visits to local green space in their estimations.

The range of activities included in a definition of recreation can also differ between countries for cultural reasons, and due to the diversity of climate, forest type and landscape. Also certain activities are categorised differently across Europe. Some national surveys include the harvesting of NTFPs such as berries and mushrooms, hunting or fishing as recreation, whereas other countries define these activities as livelihoods or resource extraction.

Regarding differences in the duration of stay, the distinction between ‘recreation’ and ‘tourism’ is essentially arbitrary. For example, research currently taking place in Scotland defines trips to forests that occur less than once a week, and for more than three hours, as ‘tourism’, while more frequent trips of shorter duration are ‘recreation’. Similarly, the UN-ECE/FAO Forest Sector Outlook Study highlights the problems associated with interpreting visit numbers where no standard unit of measurement for a ‘visit’ exists. They state: “frequent forest visitors often account for a large proportion of visits, but their visits probably tend to be much shorter in duration than those of the visitors who go less frequently. As a result of this, the most common unit used to measure visitor numbers – the number of visits per year – may not be comparable across different locations or between years” (UN-ECE/FAO 2005:105).

WP2.3 is adopting a broad definition of ‘recreational use’ to include all direct use of forests and woodlands for non-work purposes, regardless of frequency of visit and duration. It attempts to disaggregate different activities (as well as different kinds of users) as far as possible in different reference regions in Europe.

QUANTITATIVE PAN EUROPEAN SYNTHESSES OF FOREST RECREATION

Introduction

Quantitative measures of recreational use can act as a proxy for most of the tangible and intangible benefits that the public gains from direct use of forests in Europe. Crudely put, the greater the number of visits or visitors, the greater the public benefits provided by forests. However, for a full assessment of the impact of forest management on recreation, we also need to take into account the ‘quality’ of visit experience, and the kind of people making such visits. We may also wish to disaggregate forest types or regions within Europe.

If forestry agencies merely sought to increase the number of visitors/visits, and treated all visits to all forests as being of equal value, then one approach would be to build tourist attractions or shops adjacent to car parking areas. Visit numbers would increase, but people probably wouldn’t be visiting the woodland itself, or if they were they wouldn’t stray very far from the car park under such circumstances. Their experience might be more similar to those visiting an urban park.

Forests in Europe can offer unique experiences of engagement with nature and wilderness, and associated intangible benefits such as well-being and spiritual connection to the environment. Arguably it is these experiences and benefits that should be included within an impact assessment tool. Therefore, where possible, assessments of such uniquely woodland-related benefits need to be disaggregated from other kinds of benefit which are more generic. Currently the data is not available to make these distinctions beyond a small number of case studies in Europe.

Despite these reservations, aggregate data on levels of recreational use could be helpful within EFORWOOD for two reasons:

(a) to express the baseline situation regarding recreational use (and thus many important SCVs) and to show differences in this baseline between regions, forest types and social groups across Europe, and

(b) to express predicted impact on recreational use due to future scenarios such as changes in forest management (e.g. by predicting that scenario X would increase visit numbers from, say, 30m to 40m per year).

Sources of data

Four reports have been obtained to date that help us to develop a pan-European overview of levels of recreational use across Europe. These are based on data from several individual countries and/or regions.

- The UN-ECE/FAO Forest Sector Outlook Study (2005) endeavours to provide visitor numbers for most countries in Europe, and uses these figures to calculate an estimated overall value of forest recreation.
- The MCPFE ‘State of Europe’s Forests 2007’ report (MCPFE 2007) provides some data on levels of recreational use, and the value of marketed recreation, in different European countries.
- Two draft chapters from COST Action E33 ‘Forest Recreation and Nature Tourism’ (FORREC) Work Group 2: ‘Recreation and nature tourism supply and demand, including actual usage’. The first provides a “summary of site-specific studies of recreation use in forests among the European countries” (Arnberger and Grant 2007). The second examines “national recreation demand inventories and population-household based studies” (Dehez *et al.* 2007).

The rest of this section considers each of the four key pan-European studies in turn.

a) UN-ECE/FAO Forest Sector Outlook Study 2005

UN-ECE/FAO (2005:105-108) have attempted to measure the recreational use of forests in Europe. They describe in detail the methodological difficulties of quantifying the number of visits to forests, and the subsequent task of providing a valuation for forest recreation (Table 1). The report highlights that many studies around the world have produced a wide range of estimates for recreational use, which vary depending on the valuation technique used, on characteristics of the forests in question and on socio-economic variables. They note, for example, that “differences in the annual number of forest visits per person are huge and there are even significant differences between countries that might be expected to have similar figures” (e.g. Switzerland and Austria or Finland and Sweden).

The data they present is reproduced in Table 1, below.

Citing the UN Forest Resource Assessment (2000) the UN-ECE/FAO study noted that both Poland and the Russian Federation stated that “visiting the forest is the country’s main leisure activity”, yet estimates for total forest visitor numbers were provided by neither country. In addition, “Denmark indicated that 90 percent of adult Danes visited the forest at least once a year and Sweden reported that 47 percent of Swedes visited the forest between 1 and 20 days a year (with 40 percent visiting more than 20 days a year).”

Based on the estimates given in Table 1, the authors of the UN-ECE/FAO study conclude that the annual number of visits to forests could be around 1.4 billion, with an average of 6.5 visits per person per year in Western Europe and of 2.5 visits per person per year in Eastern Europe. Applying this average frequency of visits to the total population, the authors produce an estimate of 2.6 billion visits made to forests in Western Europe each year. The recreational value of forests will vary tremendously between and within countries (e.g. in relation to human population density, forest cover etc.) but based on the assumption that an average visit has an economic value of EUR 1.00, the authors calculate that

the annual recreational value of forests across Europe amounts to EUR 2.6 billion, compared with a total annual value of wood production of EUR 9.0 billion.

Table 1. Summary of forest visitor number estimates for a number of European countries in 1990s

Country	Year	Annual number of visits (millions)	Annual number of visits per capita	Source	Comments
Austria	1998	103.7	12.8	Aldrian <i>et al.</i> , 2004	Very approximate estimate, based on average frequency of visits per person.
Denmark	n.a.	50.0 ¹	9.4	Helles and Thorsen, 2004	
Finland	2000	1.0	0.2	Erkkonen and Sievänen, 2003	Visits on state land only.
Ireland	1998	8.9	2.3	Clinch, 1999	
Italy	n.a.	230.1	4.0	Pettenella <i>et al.</i> , 2004	Average of four visits per year.
Netherlands	n.a.	205.0	12.9	UN, 2000	Average of 180-230 million visits per year.
Portugal	n.a.	2.3	0.2	[Carvalho] Mendes, 2004	Expert opinion, based on limited available data.
Sweden	n.a.	153.4	17.3	UN, 2000	420,000 visitors per day.
Switzerland	n.a.	177.7	24.8	Baruffol <i>et al.</i> , 2003	Derived from average frequency of visits per person (minimum).
United Kingdom	n.a.	240.0	4.1	UN, 2000	55 million day visits to state owned lands and 185 million day visits to other public lands.
Total/average		1,172.0	6.5		
Czech Republic	n.a.	210.4	20.5	UN, 1998	Derived from average frequency of visits per person.
Lithuania	1996	7.0	2.0	UN, 2000	A fall from 17.8 million visitors recorded for 1990.
Serbia and Montenegro	n.a.	0.5	<0.1	UN, 2000	500,000 visitors per year to state forests.
Turkey	n.a.	10.0	0.1	UN, 2000	
Total/average		227.9	2.5		

Source: UN-ECE/FAO 2005: 106.

In Eastern Europe, the assumption is that the economic value per visit will be lower due to the lower GDP highlighting one methodological difficulty with this kind of valuation, which requires adjustment for the fact that some visitors may be willing to pay less even if they value the experience as highly as someone with a higher income (see also Bartczak *et al.*, in review). Based on a reduced average value of EUR 0.25 per visit, the annual value of forest recreation is estimated at EUR 120 million in Central and Eastern Europe, compared to a figure of EUR 3,217 million for wood (UN-ECE/FAO 2005: 108).

Citing Schmithüsen and Wild-Eck (2000) the UN-ECE/FAO study compares site surveys with household surveys, and considers the former to be a reliable methodology for the particular site, but one that presents difficulties when seeking to scale up beyond the boundaries of the formal recreation site under study. Household surveys can provide more representative estimates of visitor numbers over larger areas but the report questions whether the numbers generated actually refer to forest visits or merely to those areas where trees can be found.

¹ Based on further investigations (Jensen and Koch, 2004), the annual number of visits has been adjusted to 75 million (see for example Table 8).

b) MCPFE State of Europe's Forests 2007

Useful data has been generated through the MCPFE process for indicator 6.10 'Accessibility for recreation'. The data is given in Table A32 (page 228) which shows "share of forest area and other wooded land where access to public is legally allowed or accepted, 2005". 'Accessibility' itself is not considered to be a useful sustainability indicator for the FWC in EFORWOOD, because legal access doesn't necessarily reflect *de facto* access, or levels of recreational use, which is determined by several other on-site and off-site factors (see Edwards 2007). The data on "access with recreational purposes as one main management goal" could be a more useful measure, but it is still an input rather than an output indicator, and therefore would be of limited use to assess the impacts of changes in forest management.

More importantly, data on levels of recreational use has been collected for 10 countries. This is because the full definition of the indicator is: "area of forest and other wooded land where public has right of access for recreational purposes *and indication of intensity of use*". The data are given in Table 2, below.

Table 2. Estimated number of forest visits in selected countries

Country	Annual number of visits (million)	Annual number of visits per person (million)	Comments
Czech Republic	20.4	2.0	Compiled from 2,647,000 ha
Denmark	50.0 ²	9.2	
Finland	1.8	0.2	Visits on state land only (896,000 ha)
France	441.0	7.3	Compiled from 15,400,000
Germany	1,700.0	20.6	Estimated from the number of forest visitors and average visit frequency
Italy	150.0	2.6	Average of 100-200 million visits per year
Netherlands	270.0	16.6	Compiled from 360,000 ha
Sweden	339.0	37.5	75% of the population visit once a week
Switzerland	540.0	24.8	
United Kingdom	300.0	5.0	300 million day visits by adults to woodland from home, excluding visits made while staying away from home; visits by overseas tourists; visits by children (under 16) and visits not considered leisure (e.g. routine dog walking)
TOTAL	3812.2	12.1	

Source: MCPFE (2007: 100)

The report notes that: "Due to the use of different sources, methodologies and reference years, however, data are not comparable between countries and it is difficult to draw general conclusions. Estimates presented in [the table] show an average of 12.1 visits to forests per person per year. If applying this frequency to the total population in MCPFE countries, this would translate into about 10 billion visits per year. However, this figure is highly speculative; further research and efforts are needed to quantify the role of forests in recreation." (MCPFE 2007: 101).

c) Site specific studies (Arnberger and Grant)

Arnberger and Grant (2007) offer an overview of site-specific surveys of recreational use in 25 countries across Europe as part of the FORREC programme (COST Action E33). Based on completed questionnaires from representatives of participating countries in the COST Action (plus additional literature including journal articles, conference proceedings, theses and reports) they compiled a list of

² See Footnote 1.

known surveys carried out in the past 30 years (Table 3). These were divided into those using either standardised or non-standardised approaches.

Table 3. Types of data collection across participating countries

Standardised approaches	National site-specific studies	Denmark, Finland, United Kingdom
	Site-specific studies among several forests	Czech Republic, Estonia, France, Germany, United Kingdom
	Regional site-specific studies	Austria, Belgium (Walloon), Norway
Non-standardised approaches*	Site-specific studies	Austria, Belgium (Walloon/Flanders), Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Italy, Ireland, Latvia, Lithuania, Norway, Poland, Sweden, Switzerland, Slovakia, The Netherlands, United Kingdom
No site-specific studies		Hungary(**), Iceland(***)

Source: Arnberger and Grant (2007)

*Re. inter-area comparison

**Counting devices in testing phase

***First monitoring efforts started in 2006

The authors describe how standardised approaches allow for intra- (i.e. within a forest) or inter- (i.e. between forests) area comparisons across space and time. Non-standardised approaches, commonly used in many countries but with variations in methodology and quality, can unfortunately hamper any form of comparison. However, they provide an overview of methodologies used in the 25 countries studied. Of interest here are the methods used to count and interview visitors as well as the variables included in the surveys.

They identified eleven methods of visitor counting including: manual counting, the most common (by 18 out of 25 countries), automatic car traffic counters, automatic people/bicycle counters, tickets sold/permits, parking lot counts, mechanical counters, summit/guest books, video monitoring, air photography, GPS, and number of people in alpine huts.

Eight primary methods for interviewing were also categorised: on-site face-to-face questionnaires, self-filled questionnaires, trip diary, mail-back questionnaire of on-site forest visitors, postal survey of local residents near a forest, face-face interviews with forest visitors at their home, telephone interviews of local residents near a forest, and questionnaire of a forest manager.

The most commonly used method (in 20 out of 25 countries) was face-to-face questionnaire surveys. Within such interviews the main variables that appeared in surveys included socio-demographic data, types of activity, duration of stay and frequency of visits, means of transportation, and visitor preferences for recreational infrastructure. However the ways in which these data are collected can vary, which has implications for any attempts at comparison (cf Dehez *et al.*, 2007).

Table 4 below provides an overview of the site-specific approaches used by countries employing standardised methods. Only Finland, UK and Denmark have attempted to cover all types of forests and woodlands. Austria has tended to focus on urban and suburban forests and Arnberger and Grant suggest that this is related to growing concerns over the social and environmental impacts of daily recreational users from the urban centres. In France, standardised methods have been used to survey coastal forests while in the Czech Republic and Germany such approaches have also been used in some protected forest areas. Only in Denmark have private forests been surveyed in addition to public or state-owned ones.

Table 4. Overview of standardised on-site monitoring approaches

Forest types	Country example	Number of forests monitored	Main methods	Administrations/Organisations involved in monitoring
All types of woodland	UK	>100	Visitor counting & on-site interviews	State owned forests Forestry Commission
Coastal forests	France	5+3	On-site interviews	state owned forests State forest administration
All types of woodland	Finland	50?	Long-term visitor counting & on-site interviews	State-owned forests State forest administration, research institute, university
National parks	Czech Republic	4		?
All types of woodland	Belgium-Walloon	40	On-site interviews	State owned forests University & forest department
All types of woodland	Denmark	~ 600	(Long-term) visitor counting & on-site interviews	state owned forests & private forests University & forest department, private owners
Remote recreational and protected areas	Norway	6	Long-term visitor counting	State forestry commission & county municipality
(Peri-)Urban forests	Austria	4	Visitor long-term counting and on-site interviews	Municipal/public forests University & urban forest department, national park administration
Recreation sites	Estonia	10	Visitor long-term counting and on-site interviews	State owned forests State forest administration

Source: Arnberger and Grant (2007)

Northern European nations monitor recreation use in forests more regularly than some Southern and Eastern European countries. Moreover, the majority of forest recreation monitoring appears to occur in urban and suburban forests (see Table 5 below). The authors suggest possible reasons, including the growing demand for urban green spaces and concerns over human impact and overuse on non-urban forest resources. Monitoring surveys have also been undertaken in protected areas in an attempt to assess the impact of recreation on biodiversity. The authors believe that such surveys in protected areas provide a valuable, and sometimes the only, source of information on recreation use in forests.

Arnberger and Grant's review stresses the difficulties of any pan-European comparison of recreational use because of the diversity of forest types, varying survey methods, and the range of variables investigated. Nevertheless, they offer a useful overview of the methodological approaches used by various European countries as well as forest types predominant in different countries and how their designation (e.g. National Parks or Protected Areas) may impact on monitoring strategies. It is hoped

that some of the site-specific studies they identify will coincide with M2 Reference Forest regions, but the degree of overlap is not yet clear.

Table 5. Monitoring of recreation use across forest types

Forest type	Countries (examples)
Urban / suburban forests	Austria, Denmark, Finland, France, Germany, The Netherlands, Norway, Sweden, Switzerland
Remote forests	Finland, UK
Coastal forests	France, The Netherlands
Alpine/mountainous forests	Germany, Italy, Sweden, Switzerland
Forests part of protected areas	Austria, Germany, Norway, Finland, Italy, Czech Republic

Source: Arnberger and Grant (2007)

d) National household surveys (Dehez *et al.*)

The report by Dehez *et al.* (2007), as part of COST Action E33 (FORREC), also reveals the substantial problems that arise when comparing information from different countries. They brought together all available household surveys on forest recreation carried out in European member states over the last 35 years (see Table 6). Based on a sample of 21 countries from Europe, they estimate that at least 40% of the population in those countries visit forests for recreational purposes. (They provide a range from 40% – 97% although they consider the higher values to be over-estimates.)

Table 6. Number of monitoring studies of household recreation (including forest recreation) in 20 countries, 1970-2005

Country /year	1970-2005	2007-...	Monitoring strategy
Austria	1	?	No
Denmark	4	yes	No
Finland	4	yes	yes
France	6	no	No
Germany	2	yes	probably
Hungary	2	?	No
Ireland	2	no	No
Norway	13	yes	yes
Slovakia	4	no	No
Switzerland	4	no	No
The Netherlands	5	yes	yes
U.K.	19	yes	yes
Total	66		

Source: Dehez *et al.* (2007)

During the period under study, twelve countries in Europe conducted at least one national survey that incorporated information on recreation in forests. These countries are Austria, Denmark, Finland, France, Germany, Hungary, Ireland, Norway, Switzerland, The Netherlands, Slovakia and the UK. Eight countries have never conducted a national survey, including Belgium (although each region within the Federal State has done so), Croatia, Cyprus, Greece, Iceland, Latvia, Poland, Serbia and Slovak Republic. At the time of writing (October 2007), three countries had yet to reply to FORREC's WG2 request for information or there were no available contacts (Czech Republic, Lithuania and

Portugal). National household studies were also found via literature searches for Italy and Sweden (although these have not been included in the analysis to date).

All surveys selected involved some information on forest recreation. However, Dehez *et al.* also identify variations in how surveys were administered which meant that some studies had to be eliminated from their review. Examples of such cases include regional (as opposed to site-specific or national) household surveys such as forests around cities (e.g. Vienna) or surveys of different regions (e.g. parts of France) that had then been aggregated at the national level. The authors note that comparing regional surveys is not effective because of factors like the heterogeneity of populations. Similarly, site-specific studies that are then aggregated to the national level (as in Germany or the UK) may also be biased (see UN-ECE/FAO comments above).

To enhance their understanding of whether national datasets are comparable, the authors provided a selected review of methods and of the variables used in national household surveys across Europe. They used the most recent and reliable survey (or in some cases where there were missing data or obvious biases, two surveys were selected) from each country. Several factors were considered, such as:

- the method used for conducting the survey (telephone surveys were the most frequently used technique, followed by postal surveys and face-to-face interviews),
- age patterns,
- unit of analysis (i.e. individuals or ‘family’), and
- list of variables used in the survey.

As Dehez *et al.* judge that the wide variety of variables used can significantly obstruct any comparisons between them it is worth reproducing the table they constructed (Table 7) where eleven surveys were examined to see whether they included ten common variables. The table shows that much information is available for some countries but, again, the cross-country comparisons required for the study are limited by the fact that so few countries have measured the same variables.

Table 7. Examples of variable used in household national surveys

Variables	Countries
Number of visitors / Frequency of visits	A, CH, DK, FIN*, FR1, FR2, GER1, GER2, H, IR, NL*, NW*, SK, UK
Socio-demographics criteria	A, CH, DK, FIN, FR1, FR2, GER1, GER2, H, IR, NL, NW, SK, UK
Activities	CH, DK, FIN*, FR1, FR2, GER1, GER2, H, NL*, NW*, SK, UK
Travelling distance	CH, DK, FIN, FR2, GER1, H, NL, SK, UK
Means of travel	CH, DK, FR2, GER1, H, NL, SK, UK
Duration of the visit / of the stay	CH, DK, FR2, GER1, H, NL, SK, UK
Distance to close-to-home forest	DK, FIN, FR1, GER1, SK
Preferences (recreational infrastructure)	CH, DK, FR1, H, SK
Preferences (landscape/forest structure)	DK, FR1, GER2, SK
WTP (and other economic values)	DK, FR2, GER1, SK

Source: Dehez *et al.* (2007)

*partly

Note: FR1 & 2 and GER 1 & 2 refer to the fact that two surveys were selected for these countries

Dehez *et al.* also highlight other common variables not incorporated in the above table including such issues as user motivation, health and social impact/user conflicts. However, although the variables listed in the table are common amongst the countries, particularly number of visits, types of activities and socio-demographic data, the authors warn that there are disparities in how the variables are

actually defined. For example, data collected on the annual number of individual visits can vary in at least three ways, as follows:

1. The first (relating to surveys in Denmark, Finland, France and UK) involves asking the interviewee for a number (as an integer variable). Here they have discovered differences in reference periods, such as the last 12 months versus a given fixed year. Reliability of this method can be questioned as people may not be able to provide an accurate account of their visits and only one of the countries (Denmark) provides full correction for any bias.
2. The second variation (relating to surveys involves France, Germany, Hungary and Switzerland) involve the use of class intervals where individuals are asked to choose a frequency (e.g. “once a week”) which is then converted into an estimate of the annual number of visits.
3. In the third, individuals can be asked questions relating to their last trip (e.g. survey from The Netherlands) as opposed to the number of trips they have done in a year. In the latter case the total number of visits to forests is derived by aggregating all the relevant answers during the period being investigated.

While acknowledging the methodological difficulties described above, Dehez *et al.* (2007: April draft version) used a set of key variables to provide an initial, tentative valuation of recreational use in European forests.³ The set of variables comprised:

- The ‘share’ or number of visitors from within the whole population
- The annual number of visitors (for individuals and nations)
- Travel distance

The authors derived their estimates by multiplying the average number of visits by the population size and the percentage of users (see Table 8). They stated that where specific data were not available, they had then adapted the valuation techniques. Therefore class interval data were converted into integer variables and then multiplied by the appropriate time scale (e.g. ‘once a week’ was converted into 52 visits per year). The table also provides broad estimates of the level of possible bias within the data and whether this would result in over-estimation or under-estimation of visits.

Table 8. Forest Recreation in nine European Countries

Country	Year	% visitors	Visits/ individual/ year	Travelling distance (mean)	Visits/ nation/year (millions)	Possible bias	Forest cover
Denmark	1993-1994	91%	38**	8.5	75***	X	10.7%
Finland	2000	96,5%	150		600*	+	72%
France 1	2004	71.6%	11 < <18	X	600 < <850*	?	27.9%
France 2	2001	56%	18.6	10.5	560*	-	27.9%
Hungary	2005	100%?	x	X	141	+	20%
Ireland	2005	86%	24	X	18 < <72*	-	9.6%
Norway	2004	76%	44	X	121 <	-	36%
Switzerland	1997	96%	76	5.25	540*	?	31%
The Netherlands	2001-2002	X	X	X	60.5	+ -	11.1%
U.K.	2002-2003	40%	5.4	23.9	252	X	11.6%

Source: Dehez *et al.* (2007)

* personal estimations

³ This estimate was removed from a later version of the draft chapter.

** not adjusted for exaggeration (Jensen & Koch 2004)

*** adjusted for exaggeration by a factor of 2 (Jensen & Koch 2004)

Dehez *et al.*'s findings show that individual visits per year vary considerably between countries with low visit numbers for the UK and France and higher numbers for northern countries such as Denmark, Finland and Norway as well as Switzerland. Some countries (Finland and Hungary) have high national rates but Dehez *et al.* believe that these results are over-estimated. Nevertheless, their work shows that countries such as Denmark and Ireland can have high national rates of recreational visits to forests despite both countries having relatively small amounts of forest cover. The data may even suggest that national forest visiting rates are higher in those countries where forest cover is low.

Concluding remarks

Given the methodological challenges related to this work, at best the available data can only provide a crude measure of levels of recreational use across Europe, and measures may not be sufficiently sensitive to respond accurately to changes in drivers such as new forestry policies promoting recreational use. Such changes might be more reliably assessed at the case study level where the drivers and the indicator value can be measured or described more accurately.

Only two of the countries covered by EFORWOOD's Module 2 Reference Forest Regions – France and UK - are represented in Table 8 (although four countries are represented in other parts of Dehez *et al.*'s draft chapter including Austria and Germany). Similarly Arnberger and Grant's draft chapter refers to several countries of interest to us but does not identify specific forests at present.

While not directly related to Reference Forest Regions, the FORREC draft chapters (2007), UN-ECE report (2005), and MCPFE report (2007) do provide WP2.3 with a useful grounding in current research on recreational use in forests across Europe and we are able to present some relevant data for those countries involved. Their figures and analysis highlight the problems in comparing information from different countries because of the diversity of forest types, varying survey methods and approaches taken, and range of variables investigated. However, the overall conclusions of the four studies will help to place our investigations on recreational use in Reference Regions in context, and refine our conclusions accordingly. FORREC's survey of site-specific studies highlights that most visitor monitoring occurs in Northern Europe and that the majority of surveys carried out in Europe occur in urban or sub-urban forests or protected areas. Moreover, FORREC's review of national household surveys reveals that the estimated number of recreational visits to forests is not clearly, if at all, related to the amount of national forest cover. Countries which have low forest cover such as Denmark and Ireland also showed high national rates for recreational visits.

As mentioned above, MCPFE indicator 6.10 is defined as: "Accessibility for recreation: area of forest and other wooded land where public has right of access for recreational purposes and indication of intensity of use". Given the paucity of reliable information, the monitoring of visitor and visit numbers across Europe will need substantial improvement before the forestry community is able to indicate intensity of recreational use of forests to a sufficient level of accuracy for operational monitoring purposes.

INFORMATION ON SPECIFIC REFERENCE FOREST REGIONS

Introduction

Additional sources of data and descriptive information were identified through internet searches and the expertise from within the EFORWOOD consortium, and other personal contacts, to assess levels of recreational use for the EFORWOOD Module 2 Reference Forest Regions.

First, a number of topics were identified to focus data collection for assessing levels of recreational use within EFORWOOD reference regions, and/or reference forests, as follows:

- Types of recreational activities
- Types of person engaging in those activities
- The nature of the forest estate and how this impact on suitability for recreation
- Recreational facilities and levels of investment in recreational use
- Cultural preferences for different kinds of recreational use

The current state of knowledge on these topics is summarised below for each Reference Forest Region in turn. It is expected that a later iteration of this report will present a more complete picture for each region.

1. AQUITAINE

The first of the two Reference Regions in France is located in the South-West of France where the forest extends over five administrative departments (Dordogne, Gironde, Landes, Lot et Garonne and Atlantic Pyrénées). The forested area covers approximately 1,788,000ha or 43% of the total region. The main forest type is listed in EFORWOOD's Module 2 'Description of Reference Forests' (Carnus *et al.* 2007) as category 14 (Plantations and self-sown exotic forest), type 14.1 (Plantations of site-native species). At present, information is available on recreation activities in state-owned coastal forests in this region (INRA-LEF); additional information will be derived from work currently conducted on recreation activities in privately-owned planted forests which concerns 92% of Aquitaine forests.

2. AUSTRIA

The Reference Region is situated the Northern Alps, eastern Austria. Here, three forest management areas have been identified, which are located in two federal states: Lower Austria and Styria. The main forest type is classified as category 7 (Mountainous Beech Forest), type 7.2 (Central European Mountainous Beech Forests). A precondition for Module 2 to use inventory data for this region was that the forest owner, and the precise location of the forest, should remain confidential. Clearly this presents difficulties for meaningful research on recreational use, which needs to take into account the geographical location of the forest in the landscape, and in relation to population centres, etc. If permission is not granted to know this information, then reluctantly the Austrian region may have to be omitted from further work on recreation in WP2.3.

Information on forest recreation in Austria is scarce apart from regional or site-specific visitor monitoring that has been carried out in natural areas around large cities. One such study examines recreation in the Danube Floodplains National Park, east of Vienna (Arnberger & Brandenburg, 2002). While not all of the National Park will be forested, this study does at least provide some insight into Park infrastructure and associated recreational use. The paper focuses on visitor flow management to deflect the impacts of heavy use in conservation areas. The authors focus on the most frequently used entrance (called 'Orth Uferhaus' south of the village of Orth which is 15km from Vienna city limits). Here, there are a range of facilities including a 'traditional' restaurant, boat rentals and a yacht harbour, children's playground, hiking trails and potential swimming areas, as well as ample parking nearby (ibid: 8). Between June 2000 and May 2001, video monitoring and count data documented nearly 400,000 visits.

The study emphasises that where Parks are located near urban areas, many of the visitors will come from nearby suburbs and use the area for daily activities such as dog-walking (ibid: 7). Biking and hiking were the most popular activities in the Danube Floodplain National Park but the authors were also able to categorise visitors into five types (ibid: 10-11), as follows:

- Visitors interested in nature and interested in the National Park itself. These visitors normally visit at the weekend, and especially during the spring, arriving by car or bicycle.
- Gastronomic visitors who are primarily interested in the restaurant.
- Sporty/active visitors e.g. joggers or cyclists. These visitors are most prominent in spring and summer.
- Recreational visitors. The peak season is spring and summer and in the afternoons or weekends arriving by car or bicycle.
- Visitors who live within 1.5 km. These will normally only stay a short time and will either walk to the Park, cycle or take the car.

Although the National Park discussed in the paper is not in the Austrian M2 Reference Region, such a typology may work elsewhere, with the possible exception of the ‘gastronomic visitor’.

3. BADEN-WÜRTTEMBERG

Located in south-west Germany, the Baden-Württemberg Reference Region extends over 3.5 million ha or 38% of the total area and is set within 35 administrative departments. According to the Module 2 Description of Reference Forests, the main tree species in this region are European beech and Norway spruce. Most areas have beech as the potential natural vegetation (PNV).

Data on forest recreation is currently being gathered by partners at ALUFR. Meanwhile, information from tourist websites informs us that the Black Forest is a very popular recreational area in the Central Uplands and is one of the largest, most varied and well-known recreational regions in the world.

Krämer and Roth’s study (2002) on visitor flow management in the ‘Nature Park Southern Blackforest’ provides some insight into outdoor recreational activities that take place in this region (although not all take place in forests). For example, they state that there is extensive infrastructure in place for a range of sporting activities such as hiking, cycling, mountain biking, climbing, alpine and cross-country skiing and a variety of water and extreme sports (ibid: 33). The types of people engaging in these activities include international tourists or visitors from other parts of Germany. Additionally, the authors highlight potential day visitors from the 11 million people living within a 100km radius.

4. CATALONIA

The forests of Catalonia in North-East Spain cover four provinces: Barcelona, Lérida, Gerona and Tarragona. The area of forest cover in this region is approximately 1,200,000ha or 38% of the land surface, although 2 million hectares are officially designated as ‘forestlands’ and include scrublands, grassland and other areas (see M2 ‘Description of Reference Forests’ and Campos *et al.* 2005: 319). Types of forest in the Region are identified as:

- Category 7 (Mountainous beech forest), type 7.1 (south-western European beech forest);
- Category 8 (Thermophilous deciduous forest), type 8.3 (Pyrenean oak forest);
- Category 9 (Broadleaved evergreen forest), type 9.1 (Mediterranean evergreen oak forest);
- Category 10 (Coniferous forests of the Mediterranean, Anatolian and Macaronesian regions), type 10.1 (Mediterranean pine forest).

According to the European Forest Institute (EFI) website, much of Catalonia is urbanised (reaching 80%) and thus the forests in this region are becoming more popular as recreational demands increase. Within Catalonian forests, visitors can participate in sporting-related pursuits such as climbing, hiking, mountain biking, alpine, cross-country and mountain skiing, off-road driving as well as hunting and fishing. Gathering of Non Timber Forest Products (NTFPs) such as mushrooms, fruit, berries, plants, herbs and honey are cited as popular recreational activities. Facilities such as restaurants, overnight accommodation and rest stops are available in and around some Catalonian forests. Improved infrastructure (e.g. road access) and a general lifestyle shift that favours outdoor recreation has led to

an increase in forest visits but also raised some concerns about the sustainability of the forest resource. The website mentions degradation of the environment through overcrowding (e.g. too many jeeps damaging habitats) and conflicts between owners and users (e.g. gathering of NTFPs can be a little over-zealous) or between users (e.g. certain pursuits are not compatible in the same area at the same time such as hunting and active sports). As a result, the website stresses that visitor monitoring is essential.

Croitoru's (2007) review of the value of Mediterranean forests supports the assessment made by EFI above. However, she notes that despite knowledge of management practices dating back to the 15th and 16th century focused on environmental (e.g. soil and water conservation) and social sustainability (e.g. concerns for rural welfare) in regions like Catalonia, there is currently a lack of information on these types of benefits for Mediterranean forests. Croitoru highlights that studies on the benefits of forestry across the Mediterranean are primarily focused at the site level while few countries have attempted to estimate the value of the benefit's derived for their forests as a whole (ibid: 536).

For Spain generally, Campos *et al.* (2005: 319) report that forestlands cover 26,052,000 ha or 51% of the country. At least 53.5% of the forestlands have at least 5% tree cover. According to the authors, Contingent Valuation (CV) studies have been carried out at a number of protected areas, although there are no available estimates on visitor number in non-protected areas (ibid: 326). The category of "free public access and consumption of recreational services" appeared to be the most useful for this report with an estimated "final output" value of EUR 101 million. They state that as the market prices for public consumption of environmental services are not available they have used willingness to pay data from several CV studies.

Campos *et al.*'s definition of 'recreation' seems to indicate that gathering/harvesting of NTFPs like mushrooms and berries is considered to be a source of livelihood as opposed to a purely recreational activity although such activities are considered to be part of the 'benefits' of forests⁴. Croitoru also makes the same distinction for hunting stating that "In most northern countries, the benefits of hunting often include a part of recreational value. In contrast, in many southern and eastern countries, hunting is primarily a source of livelihood..." (Croitoru 2007: 542).

Further information on the Catalonia reference forests will be collected by CTFC.

5. LORRAINE

Information on this reference region is currently being collected by INRA-LEF.

6. PORTUGAL

Portugal's Reference Region stretches from north to south along the west coast. In this Region, forests cover 1,924,900 ha or 42% of the total area of the Region. Forest type falls under category 14 (Plantations and self-sown exotic forest), type 14.2 (Plantations of not-site-native species and self-sown exotic forests) although the focus for this reference region within EFORWOOD is Eucalyptus. Information on recreational use in this Region is currently being collected by partners in ISA.

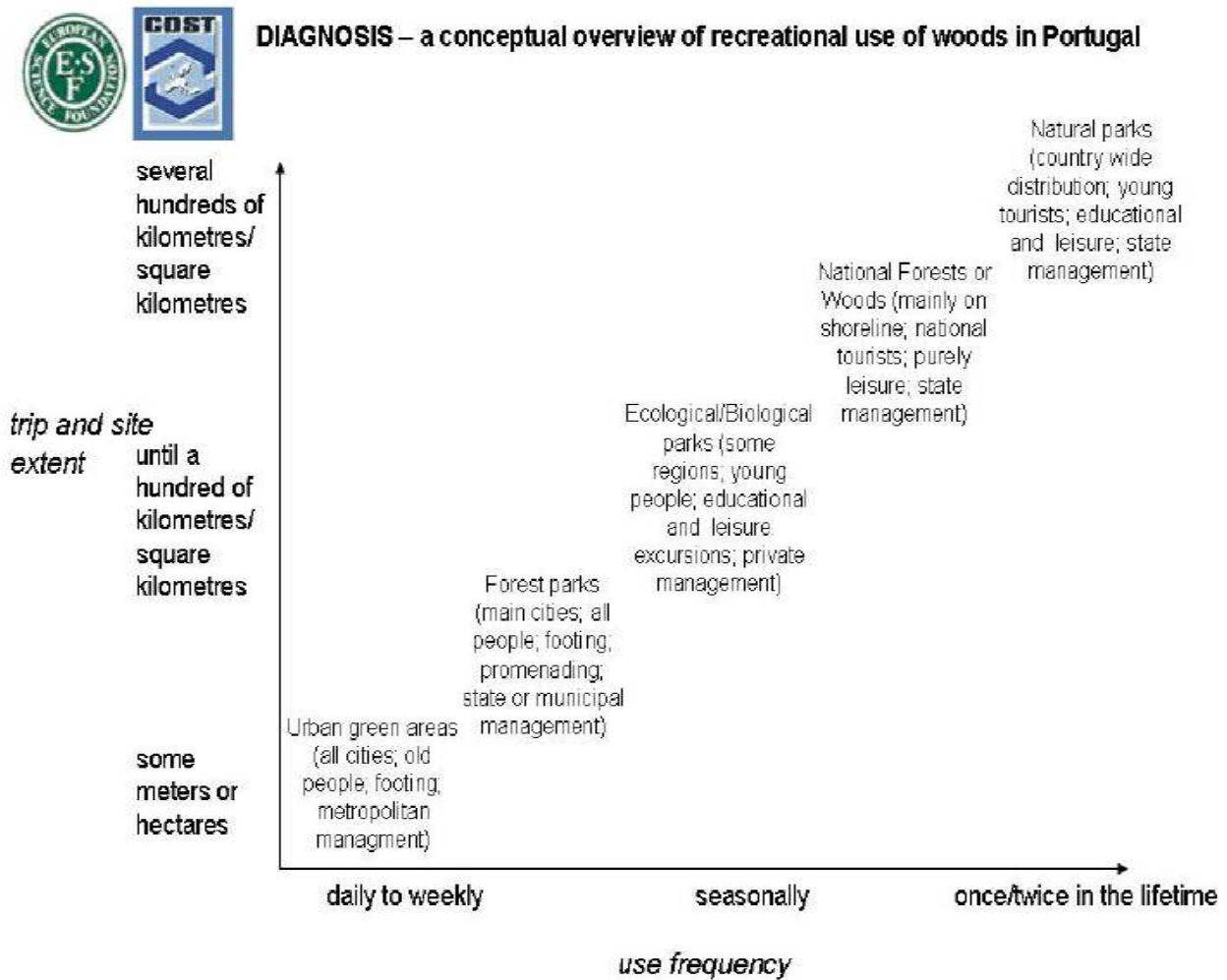
Meanwhile, Mendes (2005) provides some useful background information reporting that in the most recent forest inventory (carried out in 1995), timber production was identified as the primary use of forestland (51.8%) followed closely by NTFPs, particularly cork, which is grown in southern Portugal (ibid: 332). Mendes also outlines the ownership structure of Portuguese forests with 93.4% of forests and other types of woodlands being privately owned. The remainder is primarily classified as communal and is managed by the Portuguese Forest Services. He provides an overview of the types of forests and their owners:

⁴ Estimates of the value of NTFPs for mushrooms and berries are available separately.

- The non-industrial private forest owners (NIPFO) - managing more than four-fifths of the pine forests (typically with small holdings, in the northern and central regions) and almost all of the cork oak forests (often with large holdings in the Southern regions)
- The Forest services - managing the public forests and most of the communal forests often dominated by maritime pine
- The pulp and paper industry - managing 28% of the eucalyptus forests
- the rest being almost entirely with non-industrial private forest owners

In a presentation on the COST E33 website, Castro notes that traditionally there has been free access to privately owned forests for activities such as hunting. Like Campos *et al.* (2005), Mendes provides separate figures for the value of hunting and NTFPs such as mushrooms and berries. Importantly, he highlights that there are no data available for recreational visits to forests but there are data on the number of days spent at campsites (ibid: 346). According to Mendes almost all campsites are located in forests and therefore an assumption is made that one of the motivations of camping will be “enjoyment of forests” (except in the Algarve where the beach is likely to be the primary motivating factor for visits). The Instituto Nacional de Estatística (2002b, 2003c, cited in Mendes 2005) supplies the figure of 4.6 million days spent at campsites in 2001.

Figure 1.



Source: Castro (http://www.openspace.eca.ac.uk/costE33/outputs_presentations.htm)

A further 0.4 million nights were spent in tourist accommodation in this year. A rough estimate of day visits was calculated by assuming that half the households from two large urban cities of Porto and Lisbon (1.2 million in 2001 according to the Instituto Nacional de Estatística, 2003c) visited a forest at least once during the year and would thus count for 0.6 million day visits. The total number is therefore considered to be 6 million days a year for all types of visitors. To calculate the value of these visits, Mendes uses the only available study on recreational value of a forest reserve in Portugal (in Terceira Island, Azores) by Loureiro and Albiac (1996) (written in Portuguese) where Contingent Valuation methods were used to estimate the value of a day visit at EUR 2.75. He then extrapolates this figure for the whole of Portugal, providing a rough value of EUR 12.5 million for forest recreation in Portugal.

Despite the lack of data generally, Castro notes in a presentation on the COST E33 website that there is a growing demand for outdoor recreation and leisure. He provides a conceptual framework (Figure 1 on previous page) detailing the types of people that are likely to visit particular forests and the sorts of activities they will engage in.

This framework presents a seemingly familiar pattern with urban and sub-urban greenspaces and forests most frequently visited (on a daily or weekly basis) and more remote (and presumably larger) National Parks reserved for exceptional trips. Further details on the typology of forests and visitors within this framework would be useful in order to deepen our understanding of recreation in the Portuguese Reference Region.

7. SCOTLAND

The Scottish Reference Region comprises the whole of Scotland (three NUTS regions). The forested area is approximately 1,337,000 ha or 17% of the total area of Scotland. The forest type is category 14 (Plantation and self-sown exotic forest), type 14.1 (Plantations of site-native species) with predominant species being Sitka spruce (*Picea sitchensis*).

The Interim Report for the 'Forestry for People' (F4P) programme in Scotland provides a useful overview of levels of recreational use in Scotland (Hislop *et al.* 2006: 56-64). The authors report on five visitor surveys that have been carried out between 2003 and 2006. These are:

- Scottish Opinion Survey for the F4P study 2006 (Omnibus survey targeted at representative sample of adult population aged 16 and over – using a sample of approximately 1000 adults)
- Scottish Recreation Survey 2004/05 (representative sample of 1000 adults aged 16 and over. Part of a large household survey carried out monthly)
- GB Day Visit Survey 2002/03 (regular survey; 1500 adult (aged 16 or over) respondents)
- Public Opinion of Forestry POF (Omnibus survey conducted every two years across UK with approx. 1000 respondents from Scotland)
- All Forests Visitor Survey (site-specific. Targeted at a representative sample of Forestry Commission forests in Scotland – at least 20% surveyed)

The five surveys derive very different estimates of the number of visitors to Scottish forests and woodlands (p.60), as given in Table 9.

The report estimates that the number of visitors to Scottish forests and woodlands ranges between 34 and 64 million per year. They highlight that the variation in estimates may be due to differences in sampling protocol, real changes in number of visits over the three year period and/or ways in which the questions were framed and presented (e.g. more detailed forestry-related questions). For example, they state that the F4P survey gave a (broad) definition of forests and woodland while the GB POF surveys did not. They believe that providing more details, including a definition, facilitated a greater response from respondents as they were possibly encouraged to try harder to recall past visits and also to judge whether their outdoor trips included a visit to a woodland or forest. Moreover, the GBDV survey was more concerned about overall leisure day visits so people may not have included all their woodland/forest visits including short (i.e. not a full day) trips for activities such as dog-walking,

which were not identified as ‘leisure’. They state that the GBDV survey does not mention dog-walking at all while the Scottish Recreational Survey does not include this activity as a potential recreational pursuit. Nevertheless, as *Hislop et al.* point out, dog walking was included in the F4P survey and accounted for 19 million or 30% of the total number of visitors to forests and woodlands.

Table 9. Estimates of annual number of visitors and visits to forests and woodlands in Scotland

Study	Number of Scottish adult visitors (m) and % of adult population	Number of visits by Scottish adults (m)	Notes
Scottish Opinion Survey, F4P, 2006	2.3 (56%)	64	Conservative assumptions of frequency of visits are used to derive number of visits. Broad definition provided of woodlands and forests which may have raised the estimate.
Scottish Recreation, SR Survey, 2004/05	-	49	Total possibly constrained by framing questions in terms of ‘leisure and recreation’. 34.2m of these visits were ‘purposeful’, i.e. visiting woodland was the main purpose of the trip.
GB Day Visits Survey, 2002/03	1.5 (36%)	18	Total possibly constrained by framing questions in terms of ‘leisure day visits’
Scotland POF 2005	2.1 (50%)	-	No. of visits in “last few years” rather than “last 12 months”. Survey did not ask for frequencies of visits.
Scotland POF 2003	2.7 (64%)	-	No. of visits in “last few years” rather than “last 12 months”. Survey did not ask for frequencies of visits.
GB POF 2005 (Scottish respondents)	2.7 (65%)	34	No. of visits in “last few years” rather than “last 12 months”. Small sample size (n=254).
GB POF 2003 (Scottish respondents)	2.8 (67%)	43	No. of visits in “last few years” rather than “last 12 months”. Small sample size (n=265).

Source: Hislop et al. (2006).

Based on the range of visitor numbers, and using Willingness to Pay (WTP) values from Scarpa (2003) and elsewhere, Hislop *et al.* tentatively conclude that the value of recreation in Scottish forests and woodlands is estimated to be between £39.7m -£81.9m.

8. SILESIA

Silesia is located in the South of Poland and has a total area of 25,000 km². Of this area, 735.700 ha is forested, or 29% of the total area, covering two administrative departments, Śląsk and Opole. These are listed as category 2 (Hemiboreal forest and nemoral coniferous and mixed broadleaved coniferous forest), type 2.2 (Nemoral Scots pine) and type 2.6 (Mixed Scots pine-pendunculate oak forest).

Information on forest recreation use in Silesian forests has been provided by our EFORWOOD partners at the Forest Research Institute, Poland (IBL),⁵ but we also have additional information from a SENSOR-IP report on Silesia by Bierwiazzonek *et al.* (2006) and a journal article by Bartczak *et al.* (in review). The Silesia region is one of the most highly industrialised areas in Poland with a population of around 4,700,000. Demand for outdoor recreational facilities is high. Despite a long history of resource extraction and industrialisation, almost 29% is covered by forest, most of which is state owned and managed by the State Forest Enterprise. Recreational activities that take place include biking, horse riding, skiing, camping, ‘day’ camping (for barbeques etc.), gathering of NTFPs and tourist or educational activities such as walking, visiting view points and forest education centres. The

⁵ Figures used in the document on recreational values in Silesia region were taken from the official State Forests web page: <http://www.katowice.lasy.gov.pl/strony/1/i/20.php>

most popular of these are considered to be ‘day’ camping, mushrooms and berry picking, and tourist-related activities (Bierwiazzonek *et al.* 2006).

Table 10 provides an overview of the available facilities and infrastructure already in place. Unless otherwise indicated, the figures relate to actual numbers. For example, there are 82 camping spots within Silesia, or 48 if those in the mountain regions are excluded and the focus is only the reference forests.

Table 10. Recreational facilities and infrastructure available in Silesia

Facility	Total in region	Total excl. mountains ¹
Recreation area	11	10
Car Parks	116	91
Camping area	45	22
Camping spots (within the forest)	82	48
Parking places	270	251
Recreational areas (within the forest)	35	28
Bike paths	139	115
Horse-riding paths	38	30
Tourist paths (km)	2373,4	1372,3
Downhill ski paths (km)	38,74	4,8

Source: Bierwiazzonek *et al.* (2006)

¹ The area of primary concern to EFORWOOD is mainly lowland/upland area covered by Scots Pine stands. For this reason, the mountain areas with Norway spruce and beech are excluded from analyses.

Source: IBL *pers. comm.*

Bartczak *et al.* (in review) supply useful background information on forest recreation across Poland, allowing us to locate the recreational activities in Silesia within a wider national context. Poland has 28.3% forest cover comprising 9.2 million hectares (ibid: 3). More than 80% of Poland’s forests are State owned and mostly administered by the State Forest Enterprise. Most of the forests have free access, although National Parks can charge an entrance fee. The authors used a national survey of recreational patterns coupled with on-site surveys (incorporating Contingent Valuation and Travel Cost methods) from ten representative forests in Poland to estimate “the average per trip and total annual recreation value of forests”. The combination of surveys also allowed them to include non-users as well as current users.

They found that in the national survey (of 1000 people) 85% of respondents had visited a forest at least once during the past 12 months, with the average number of trips made in 2005 totalling 1221 million (average of 41 trips per adult per year). The most popular activity in forests was walking (85%), followed closely by mushroom and berry picking (80%). One thousand people were also surveyed at ten representative forests in 2005 and data from this survey allowed a more detailed insight into the trip itself. For example, the average number of trips to a forest per adult was 72 (median of 31 trips) with the average duration of a single trip being 2 hours (ibid: 11-12). Overall, it was found that National Parks are visited less as they tend to be located further away from populated areas. Moreover, people who live near to forests often make more trips than do visitors who have to travel longer distances (ibid: 16).

Based on the Travel Cost approach, Bartczak *et al.* estimate the annual recreational value of forest visits to be 5 billion. Depending on the valuation methods used, per trip values (per person) range from EUR 0.64 to 4.69. Clearly, this figure diverges considerably from the values given in the UN-ECE/FAO report 2005 discussed above. Bartczak *et al.* contest the general practice of transferring unit values per trip from Western Europe with the associated assumption that recreational benefits will vary with income so that value of a forest trip in Europe will be EUR 1 and in Central and Eastern Europe 0.25 (ibid 3; cf. UN-ECE/FAO conclusions on page 7). They emphasise that their results

indicate that Polish residents visit forests more often than Western Europeans and place a higher value on each trip. They state: “There is some evidence that environmental values increase with measures of income at a less than proportionate rate at least for some goods (notably water quality, wetlands and air pollutants) and income levels. Forest recreation may also display Kuznets curve characteristics, i.e. a U-shaped relationship between recreational values and GDP levels. If so, recreation values in CEE [Central and Eastern Europe] may also be higher in absolute terms than in Western Europe” (ibid: 3-4).

9. VÄSTERBOTTEN

The Reference Region of Västerbotten is located in Northern Sweden, and extends from the Scandes in the West to the Baltic Sea in the East. The area of forest covers 3,179,000 or 58% of the total area and is classified as category 1 (Boreal forests), type 1.1 (Spruce and Spruce-birch boreal forest) and type 1.2 (Pine and Pine-Birch boreal forest). Further data on the recreational use of forests in this Reference Region will be collected and analysed by our partner at KVL.

Two studies from the 1990s provide us with background information on recreational use of forests in Västerbotten. Mattsson highlights that the ‘right of common access’ means that anybody can enjoy the forest, no matter who owns it, but that the level of appreciation that people have for a forest will depend on the quality of its attributes (Mattsson 1994: 79). Mattsson and Chuanzhong (1993) assessed the non-timber value of forests in Västerbotten⁶ based on a postal questionnaire received from a random sample of 1,245 individuals in 1991. According to the authors, non-timber values include walking or hiking, camping, gathering of NTFPs such as mushrooms and berries and “off-site visual experiences” (e.g. landscape and aesthetics, see Edwards 2006: 34-35). Hunting and reindeer-herding were excluded from the study (Mattsson and Chuanzhong 1993: 427).

In their paper, Mattsson and Chuanzhong estimated that 18-19 million visits per year were made to Västerbotten forests in 1991. Individuals on average made 12 visits to forests in the summer, 9 visits in the autumn, 6 visits in the winter and 8 visits in the Spring. Within the forests, 50% of visits covered between 1-5 km and a further 30% of visits were confined within a 1 km radius. Travel distance to forests was clearly an influencing factor as 45% of respondents most frequently visited forests that were less than 1km from where they lived, while nearly 50% visited forests within 5km of their home. As a consequence there was some concern about heavy visitor pressure on forests close to highly populated areas (e.g. over 1000 inhabitants) (ibid: 430).

Applying Contingent Valuation, the authors estimated the “global non-timber value” to be 5856 SEK per individual per year (see pages 428-431 for methods). They then aggregated the non-timber value for the 180,000 inhabitants of the region between the ages of 17 and 74 to arrive at the figure of 1050 million SEK [approximately EUR 112 million]. Approximately two thirds of this value related to on-site activities such as hiking, camping and gathering NTFPs, while a third was attributed to the aesthetic or visual experience of the forest off-site (ibid: 433).

SUMMARY AND CONCLUSIONS

The information generated for this report provides important background material and context to WP2.3’s future work to analyse the impacts of forest management on recreation use across Europe. This final section provides a list of key findings which will be used, and a list of gaps to be filled, during the next steps in the work of WP2.3.

Key findings

Main points that emerge from the reviews given above are as follows:

⁶ According to these authors, forest cover extends over 3.4 million ha or 61% of the total region (p. 430).

1. Availability of data

There is a large quantity of publicity literature on the recreational use of forests in different European countries (mainly in national languages) but few quantitative or qualitative studies. Data tend to be for specific locations and from specific studies. The survey of site-specific studies also highlights that most visitor monitoring occurs in Northern Europe and that the majority of surveys carried out in Europe occur in urban or sub-urban forests or protected areas. This will likely have implications for WP2.3's search for data on forest recreation in the Reference Regions. A few studies provide estimates of the economic value of forest recreational activities.

2. Diversity in the character of recreational use

A wide range of recreational activities is reported, including sailing, playground activities, hiking, swimming, walking/dog-walking, cycling/mountain biking, skiing and other 'extreme' sports, an interest in nature, horse riding, NTFP collection, off-road driving, hunting and camping. Likewise forests are used by a wide range of types of visitors (and at different frequencies) across a spectrum from very regular visits to urban green areas and city forest parks, week-end visits (often in spring and summer) to forests, and occasional visits to National Parks or very large protected areas. In several regions there are (growing) conflicts and concerns over recreational use versus forest sustainability, for example Catalonia.

3. Difficulties with comparison between countries and regions

There is no overarching methodological and epistemological framework for understanding and measuring recreational use in forests across Europe. Given the paucity of reliable information, the monitoring of visitor and visit numbers across Europe will need substantial improvement before the forestry community is able to indicate intensity of recreational use of forests to a sufficient level of accuracy for operational monitoring purposes.

4. Link between recreational use and forest cover

FORREC's review of national household surveys reveals that the estimated number of recreational visits to forests is not clearly, if at all, related to the amount of national forest cover. Countries which have low forest cover such as Denmark and Ireland also showed high national rates for recreational visits. This finding may challenge assumptions that are often made regarding level of recreational use in different parts of Europe.

5. Establishing an expert network

Preparation of this report has helped to identify relevant recreational experts across Europe to be included in the WP2.3 expert panel, which will refine conclusions about the impact of forest management on recreational use.

Gaps to be filled

The information presented in this report remains patchy and incomplete, and this is to be expected with such a large and relatively new research agenda. The report is not intended to provide a comprehensive picture, but to determine what information is currently accessible, how it can help the work of WP2.3, and what gaps need to be filled. These gaps are outlined below, and organised into a framework in the Appendix. See also the EFORWOOD Implementation Plan, Months 25-42, and Edwards (forthcoming), for further explanation.

1. Coverage of Module 2 Reference Forest Regions

Major gaps remain in current knowledge of forest recreation in several Reference Forest Regions. WP2.3 partners will meet in February 2008 in Lisbon to fill some of these gaps. In particular, substantial data and information on Aquitaine and Lorraine in France will become available. Some of the countries outlined in the FORREC (Cost Action E33) site-specific studies (Arnberger and Grant) are relevant to WP2.3's focus on M2 Reference Regions (Austria, France and UK). All three countries have used standardised approaches to monitoring recreational use. Only the UK has attempted to cover

all types of forests and woodlands while Austria has tended to focus on urban and suburban forests and France on coastal forests. It is hoped that some of the site-specific studies they identify will coincide with M2 Reference Forest regions, but the degree of overlap needs further investigation by WP2.3.

2. Towards a pan-European understanding of forest recreation

Considerable work would be required to deliver a reasonably comprehensive picture of forest recreation across Europe. Surprisingly this has yet to be realised despite the strong interest in forest recreation among policy makers and managers as a vehicle to enhance the social values of forests to the European public. WP2.3's future research is likely to be exploratory but will, for the first time, bring together disparate sources of quantitative and qualitative data to draw conclusions about the impact of silvicultural and non-silvicultural factors in different forests within the M2 Reference Regions.

3. Beyond quantification

Quantitative measures of recreational use can act as a proxy for most of the tangible and intangible benefits that the public gains from direct use of forests in Europe. However, for a full assessment of the impact of forest management on recreation, we also need to take into account the 'quality' of visit experience, and the kind of people making such visits. This will be attempted as part of the literature review for D2.3.3, and especially during planned case study work (see EFORWOOD Implementation Plan, Months 25-42).

4. Definitions of recreational use

As there are wide variations in how recreation is defined across Europe, it will be necessary for WP2.3 to document carefully the differences in definitions and associated activities across the Reference Forest Regions, and to take these into account during analysis.

5. Further development of regional profiles

WP2.3 needs to continue to build profiles of forest recreational use in the Reference Forest Regions. Each partner (linked to a specific Region) is tasked with gathering available quantitative and qualitative (descriptive) data and information. A framework has been developed to aid the collection of data and information where available (see Appendix). Data to be collected includes:

- Total population and identity of urban centres in each region
- Main forest recreation sites
- Levels of recreational use
- Ranking of recreational activities
- Types of recreational user
- Level of forest recreation infrastructure

The current gaps are highlighted in the Appendix and it is proposed that this framework is gradually filled in using similar methods to those employed for this report (literature, web searches, personal contacts etc.). This should not become an exercise in data collection for its own sake, but must focus on data and information required to support the WP2.3 research agenda, namely to help refine our conclusions (derived primarily through literature reviews and expert judgement) regarding the impact of specific changes in forest management on levels and quality of recreational use in different forest types and regions of Europe.

6. Literature review of impacts of forest management

As this report has clearly demonstrated, the variation in availability and reliability of data on recreational use of forests will limit any attempts at pan-European comparison. However, some important generalisations will be possible. WP2.3 will carry out an in-depth review of relevant literature dealing with the impact of different aspects of forest management on recreational use. This will be reported as Deliverable D2.3.3, and will focus on three related areas of work:

1. Preference studies, which determine impacts of silvicultural variables such as stand age, density and species composition on public preferences.
2. Economic research that calculates willingness to pay for silvicultural and other forest management changes.
3. Modelling of forest visit numbers according to several on-site and off-site variables, including both silvicultural factors, non-silvicultural factors, and attributes of the site, alternative sites, and the catchment population.

7. Refining conclusions with experts

The conclusions made from the literature reviews and other work for PD2.3.2 and D2.3.3 will be opened up to challenge and refinement through workshops or delphi processes with relevant European experts.

8. Refining conclusions through case studies

Finally, ‘bottom up’ case study research in two or three Reference Forest Regions can also ‘ground truth’ the findings by conducting interviews and focus groups with local forest managers and rangers, accompanied by forest design plans, to ask their views on how different Forest Management Alternatives might impact on social and other indicators. Provisionally, this work will be carried out in Scotland and Baden-Württemberg. It is hoped that the case studies may provide insights for other Work Packages in Module 2 by bring together analysis of economic, environmental and social impacts of forest management in particular locations, to understand trade offs and other cross cutting effects. This will be reported in the final implementation phase of EFORWOOD.

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APPENDIX: Framework for background information and data relevant to recreational use of forests in M2 Reference Forest Regions (showing information collected to date)

	Total area of region (km2)	% forested area	% public ownership of forest	Location and administrative regions	Cities and towns in region and/or catchment	Main forest type	Main tree species	Other tree species	Reforestation	Total population of region	Names of top forest recreation sites	Scale of forest visits	Ranking of recreation activities and/or type of user	Level of forest recreation infrastructure
Aquitaine	41000	43	8	5 departments: Dordogne, Gironde, Landes, Lot-Garonne, Atlantic Pyrénées		14 (14.1)	Maritime pine (<i>Pinus pinaster</i>) mainly even-aged stands	<i>Quercus</i> , <i>Alnus</i> , <i>Fraxinus</i> , <i>Betula</i> , <i>Castanea</i>	Plantation, direct sowing, assisted natural regeneration on dunes					
Austria	33	60	100	Northern Alps, east Austria: 3 management areas in two federal states- Lower Austria and Styria		7(7.2)	Spruce (<i>Picea abies</i>), Even-aged mixed stands	<i>Fagus sylvatica</i> , <i>Larix decidua</i>	Natural regeneration, assisted planting where necessary. Local provenance					
Baden-Württemberg	35000	38	24 (+ 40% communal)	South-West of Germany: 35 administrative departments (Landkreise)			Norway spruce (<i>Picea abies</i>)	<i>Fagus sylvatica</i>	Plantation and natural regeneration					
Catalonia	32000	38	17	North-east Spain: 4 provinces – Barcelona, Lérida, Gerona, Tarragona		7 (7.1), 8 (8.3), 9 (9.1), 10 (10.1)	Pine (scots, Alepo, Corsican, other)	Oak (Holm, Cork, other)	Predominately natural regeneration				Not ranked but include: climbing, hiking, biking, skiing, off-road driving, hunting, fishing, gathering NTFPs	
Lorraine	-	-	-	-	-	-	-			-		-		
Portugal	45876	42	50	North to South along West Coast over 19 NUT III		14(14.2)	<i>Eucalyptus globules</i>		Planted and coppice stands			Whole of Portugal in 2001 = 6 million day visits. Mendes (2005)		
Scotland	78772	17	35	Northern part		14 (14.1)	Sitka spruce		Planting (85-					

				of UK covering northern, eastern and southern Scotland			<i>(Picea sitchensis)</i>		90% of sites) natural regeneration					
Silesia	25000	29	83	Middle south of Poland. 2 departments: Slask and Opole		2 (2.2, 2.6)	Scots pine (<i>Pinus sylvestris</i>) Even aged (main type) or two-layered stands for converted stands	<i>Picea, Quercus, Betula, Fagus</i>	Artificial plantation after clearcutting	4,700,000		1221 million for whole of Poland (Bartczak <i>et al.</i> in review)	'Day' camping, harvesting NTFPs, walking, visiting viewpoints	See Table 8. specifically, recreational areas, camping areas, bike and horse-riding paths, tourist paths, ski slopes, parking
Västerbotten	54860	58	35	Northern Sweden from Scandes to Baltic Sea		1 (1.1, 1.2)	Scots pine (<i>Pinus sylvestris</i>), mainly even-aged stands	<i>Picea abies, Betula spp</i>	Plantation (50%), natural regeneration (42%) and direct seedling (2%)	180,000 (between ages of 17-74) Mattsson and Chuanzhong, 1993)		18-19 million visits in 1991 (Mattsson and Chuanzhong, 1993)	Not ranked but include: walking, hiking, camping, NTFPs, 'off-site visual experience'	