



Research Report

A valuation of the economic and social contribution of forestry for people in Scotland

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David Edwards, Anna Elliott, Max Hislop, Suzanne Martin, Jake Morris, Liz O'Brien, Andrew Peace, Vadims Sarajevs, Maud Serrand and Gregory Valatin

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EXECUTIVE SUMMARY

1. BACKGROUND TO THE PROJECT

1.1 Introduction

The aim of the project was to carry out a comprehensive valuation of the current social and economic benefits of forestry, forests and woodlands in Scotland that are derived by the people of Scotland.

The study was commissioned by Forestry Commission Scotland and Corporate and Forestry Support of the Forestry Commission, Edinburgh, and carried out between April 2006 and March 2008 by the Social and Economic Research Group of the Environmental and Human Sciences Division of Forest Research.

The research was based upon a typology of seven 'Forestry for People' themes as follows: employment and volunteering, contribution to the economy, recreation and accessibility, learning and education, health and well-being, culture and landscape, and community capacity.

An indicator framework was developed as a basis for defining the scope of the project, reporting of headline findings, and to aid project management. Thirty quantitative indicators covering the seven themes are given in the report.

The use of quantitative indicators was supplemented by qualitative research from two contrasting case study regions: the Loch Ness area in the Scottish Highlands, and the Glasgow and Clyde Valley region.

1.2 Methodology

The project used an inter-disciplinary methodology, which made particular use of the following six methods:

- a) Economic analyses of the market and non-market benefits of forestry
- b) National Omnibus surveys of representative samples of Scottish adults
- c) A GIS-based viewshed analysis to assess the visibility of forests from residences in Scotland as a basis for economic valuation of the contribution of forests to the Scottish landscape
- d) A questionnaire survey of all known organisations in Scotland that carry out forest-related activities
- e) Two qualitative case studies
- f) Literature and data searches

2. THEMATIC RESEARCH

2.1 Employment and volunteering

The total employment (i.e. direct, indirect and induced) in the Scottish forestry sector associated with the use of Scottish timber is estimated to be 13,200 full-time equivalent (FTE) jobs. This is made up of 10,300 FTEs for direct employment; 1,500 FTEs for indirect employment; and 1,400 FTEs for induced employment. The figure for direct employment equates to around 12,000 jobs, since not all employment is full-time. These estimates are based upon a broad definition of the forestry sector that includes: forestry harvesting and planting; farm woodlands; haulage; primary wood processing; pulp and paper; and public sector, non-governmental organisation, and research and education employment that is associated with Scottish forests. The estimate excludes employment associated with the use of timber not grown in Scotland.

In addition, the total employment due to first-round (direct) spending from tourism and recreation attributable to woodland, where woodland was the primary reason for the visit, is estimated to be around 17,900 FTE jobs.

The number of volunteers in forest-related work in Scotland is estimated to be around 7,500, while the number of volunteer days in the 12 month period from mid-2006 to mid-2007 is estimated to be around 47,400.

2.2 Contribution to the economy

The total Gross Value Added (GVA) (direct, indirect and induced) associated with Scottish timber is estimated to be around £460 million at 2007/08 prices, or 0.5% of the total GVA for the Scottish economy. This total is made up of £304 million for direct GVA, £86 million for indirect GVA and £69 million for induced GVA. These estimates are based upon the broad definition of the forestry sector outlined above, excluding GVA associated with the use of timber not grown in Scotland.

In addition, the GVA of first-round (direct) visitor spending attributable to woodland visits, where woodland was the primary reason for the visit, is estimated to be £209 million at 2007/08 prices.

In mid-2006, an estimated 74% of the Scottish adult population agreed or strongly agreed that 'woodlands are important in helping people to earn a living or make ends meet'.

GVA and employment associated with non-timber forest product harvesting and the game sector in Scotland are difficult to assess, although both sub-sectors appear to provide small but significant contributions to the economy.

2.3 Recreation and accessibility

The percentage of Scottish adults who visited Scottish woodlands varied between 56% in 2005/06 (August 2005 to August 2006), and 41% in 2006/07 (August 2006 to August 2007). This equates to 2.3 and 1.7 million people respectively. The substantial decline between 2005/06 and 2006/07 is likely to be largely due to the unusually wet summer of 2007.

It is estimated that the annual number of visits by Scottish adults ranged between 68 million in 2005/06 and 37 million in 2006/07. At least 6 million of these visits were made to forests managed by Forestry Commission Scotland. Although more visits are made to non-Forestry Commission woodlands, on average, visits to Forestry Commission woodlands were of a longer duration and involved longer round trips.

In addition, in 2006/07 an estimated 63.5% of Scottish children made a total of 11.6 million visits to Scottish woodlands.

An estimated 51% of visits to Scottish woodlands by Scottish adults were made while accompanied by a dog.

Adults from the most deprived areas in Scotland, those from urban areas, C2 and DE socio-economic groups, and the 55+ years old age class, were all significantly less likely to have visited woodlands in the previous 12 months than those from other social groups.

The non-market value of visits to Scottish woodlands by Scottish adults is estimated to be between £44 million and £76 million per year.

Around 1,500 public events were organised by Forestry Commission Scotland between August 2006 and August 2007, involving an estimated total of 134,000 visits.

72% of Scottish adults surveyed stated that they had woodland near to where they lived (within a 10 minute walk). Of those who had local woodland, 22% did not feel safe visiting their local woodland, with women more likely to feel unsafe than men.

2.4 Learning and education

15% of the Scottish adult population, or members of their families, were estimated to have attended a forest-based organised learning activity or event in the previous 12 months.

24% of Scottish children were estimated to have visited woodland in the previous 12 months as part of a nursery or school trip. Each child made an average of 2.3 visits per year, which equates to a total of around 510,000 visits.

Forestry Commission Scotland works with an estimated 20% of schools in Scotland, through school trips to forests, ranger visits to schools, and Forest School initiatives.

An estimated 24% of the Scottish adult population, who had visited woodland in the previous 12 months, had followed an interpreted trail.

58% of the Scottish adult population were estimated to have recalled seeing or reading about at least one topic related to Scottish forests, woods or trees in the last 12 months. 13% of respondents had used the Internet and 14% had used a leaflet to find out something about woodlands. 22% had discussed something about woodlands with their family or friends.

An estimated 96% of the Scottish adult population agreed or strongly agreed that woodlands allow families to learn about nature. 95% agreed or strongly agreed that woodlands play an important role in children and young people's outdoor learning experience.

2.5 Health and well-being

An estimated 5% of the Scottish adult population had attended an organised event in a wood that involved physical activity in the previous 12 months.

Around 40% of the Scottish adult population carry out the recommended minimum level of at least 30 minutes of moderate intensity exercise on at least five days a week. 2.5% are estimated to be exercising at this level in woodlands, and 2% are estimated to be exercising for at least 30 minutes on three or four days a week in woodlands.

9% of the public events organised by Forestry Commission Scotland between mid-2006 and mid-2007 were considered to have had 'health and well-being' as the primary purpose. 'Health and well-being' events involved 13% of all visits by the public to Forestry Commission Scotland events in that year.

An approximate estimate for the annual value of the physical and mental health benefits of Scottish woodlands is calculated to be between £10 million and £111 million at 2007/08 prices, depending upon the assumptions used. Further research is needed to refine these estimates.

An estimated 82% of the Scottish adult population agree or strongly agree that woodlands are places to reduce stress and anxiety, while an estimated 79% agree or strongly agree that woodlands are places to exercise and keep fit.

2.6 Culture and landscape

There are 1,418 scheduled ancient monuments located within Scottish forests, and 150 recorded Heritage Trees and at least 1,000 recorded Ancient Trees in Scotland.

An estimated 3.5% of the Scottish adult population who had visited woodlands in the previous 12 months said that their visits had involved seeing something of cultural interest in the wood (e.g. cultural features such as sculptures, ancient trees or historic sites). Approximately 7% of all visits to woodlands involved seeing features such as these.

Approximately 1.5% of the Scottish adult population who had visited woodlands in the previous 12 months said that they had attended a cultural event or activity while in woodland.

Around 3% of events organised by Forestry Commission Scotland between mid-2006 and mid-2007 were considered to have had 'cultural activities' as the primary purpose. These events involved a total of 4,900 visits (i.e. 4% of all visits to organised events).

Preliminary results from viewshed analyses suggest that approximately 557,000 people in Scotland have visible woodland within 1 km of their homes, while 275,000 people have visible woodland within 300 m of their homes. The economic value of woodland views from homes and on journeys by commuters in Scotland is estimated to be between £21 million and £90 million per year at 2007/08 prices, depending upon the assumptions used.

An estimated 95% of the Scottish adult population agree or strongly agree that woodlands in Scotland are an important part of the country's natural and cultural heritage.

Around 57% of the Scottish adult population are estimated to gain substantial benefit from seeing trees or woods from where they live, while 50% are estimated to gain substantial benefit from seeing trees or woods as they undertake their daily activities.

An estimated 68% of the Scottish adult population gain substantial benefit from knowing that there are trees and woods in Scotland, while around 72% gain substantial benefit from knowing that Scottish woodlands will be there for future generations. 70% gain substantial benefit knowing that Scottish woodlands provide a place for wildlife.

2.7 Community capacity

An estimated total of 138 community woodland groups are active in Scotland, with an estimated total membership of around 13,500.

Of the sample of community woodland groups surveyed in 2007, 66% of their directors, committee members and trustees were male, 28% were over 60 years of age, 5% were people with a disability, and all were from a 'white' ethnic background.

The total number of woodlands managed by community woodland groups in Scotland is estimated to be around 250, covering a total of 18,275 hectares, or around 1.4% of the total woodland area in Scotland.

The total annual income that was received by community woodland groups in Scotland between mid-2006 and mid-2007 is estimated to be around £4.5 million, of which 50% was grants from public bodies, 17% from donations, 10% from membership fees, 6% from sales of forest products, and 6% from sales of other goods and services.

The proportion of Scottish adults who were involved in, or consulted about, forestry plans in the 12 months prior to mid-2006 is estimated to be 2%, while 83% agreed or strongly agreed that it is important to have a say in what happens in their local woodland.

Around 65% of the Scottish adult population are estimated to agree or strongly agree that woodlands are good places to meet with friends and family.

3. CASE STUDY RESEARCH

On the basis of case study research in the Loch Ness and Glasgow and Clyde Valley regions, the range of benefits to the people of Scotland includes the following:

- Employment and volunteering opportunities provided by forest-related organisations and initiatives, and due to visits to the region associated with forests and woodland.
- Contributions to local economies due to forest-related employment and visitor spending.
- Increased human capital and hence employability of individuals who participate in forest-related initiatives and activities, through educational attainment, training and skills development, and life skills such as teamwork and leadership.
- Fun, happiness and well-being.
- Raised awareness and understanding of the natural environment of residents and visitors through connections with nature.
- A sense of civic responsibility for, and ownership of, local natural resources.
- Reinforcement of positive behaviour among young people and associated increases in capacity for learning.
- Improvements to mental and physical health associated with outdoor activity and associated healthy lifestyles.
- Stress reduction and other emotional and mental health improvements due to woodland visits and woodland views, and due to associated social interaction with friends and family.
- Stronger sense of identity and belonging associated with particular wooded landscapes.
- Increased social inclusion and community cohesion associated with shared experiences of forests through visits, or volunteering and employment, associated with forests.
- Increased community capacity to achieve shared goals, through increased 'bonding' social capital (i.e. within communities), and 'bridging' social capital (i.e. between members of communities and external partners).

The multiple benefits derived from any individual 'forestry for people' initiative were present across the seven themes used to structure this research. Thus, livelihood benefits are derived principally as a result of the planning and delivery of other 'forestry for people' initiatives. Similarly, activities that are organised to provide learning and education, for example, may also indirectly provide a wide range of other benefits, such as health and well-being, or recreational opportunities.

There is evidence from the case studies to show that forest-related initiatives targeting individuals and communities in both case study locations address a range of local development issues and needs, and a number of key government agendas.

The most notable finding was the evidence of a substantial increase in the scale and extent of partnership-working between agencies, both within and beyond the forestry sector and at different spatial scales and levels of governance. In contrast to the 1990s, partnerships are now a fundamental feature of contemporary 'forestry for people' activity in Scotland, reflecting a new, outward-facing and collaborative dynamic that is having a positive effect on community development and the generation of public goods.

4. CONCLUSIONS AND NEXT STEPS

A number of areas of further research have been identified that would enhance the overall quality of the assessment, including the following:

- Further work is needed to strengthen the contextual information available to allow more meaningful interpretation of the results, in particular by providing data to show trends over time, and by comparing social and economic values for woodland with other competing kinds of land use.

- Use of spatial datasets and GIS could contribute new information on all 'forestry for people' themes in this study, and on cross-cutting issues relating to differential participation and impacts upon different social groups.
- The challenge of integrating the use of quantitative indicators with the qualitative approach employed in the case studies could be realised more fully with research that systematically quantifies and describes use and non-use of particular woodlands for different purposes by different types of people. Such studies could monitor changes over time, and be broadened to include a wider range of benefits.

These proposals are provisional, and have been prepared as a basis for further discussion within and beyond Forestry Commission Scotland on how to refine social and economic research agendas in the Scottish forestry sector in the light of the information presented in this report.

SECTION 1: BACKGROUND TO THE PROJECT

1.1 INTRODUCTION

Background

This report presents a comprehensive body of evidence, drawn from existing sources and commissioned research, to assess the diverse range of economic and social benefits that the people of Scotland gain from Scottish forestry, forests and woodlands. The research was funded jointly by Forestry Commission Scotland (FCS) and Corporate and Forestry Support of the Forestry Commission (FC), and carried out by Forest Research between April 2006 and March 2008. The report is the first of a series of documents, publications and seminars that are being planned to disseminate the final conclusions of the project.

The idea for the project originated with the Forestry for People Panel, an independent group of forestry stakeholders established in 2000 to advise FCS on how to address the social agenda in forestry. One of the observations of the Panel, expressed in its final report, was the lack of evidence available to decision-makers of the social benefits of forestry, and they recommended that FCS should commission a piece of research to assess the value of the 'social forestry sector' in Scotland. Over the previous decade, an increasingly broad range of social benefits was being recognised within the forestry sector. Meanwhile declining timber prices provided new incentives to enhance social benefits of forests, and to enhance public awareness of them.

It was acknowledged that new methods would need to be developed, and new ways of thinking established within FC, to provide the necessary evidence in ways that were useful to policy makers and other forestry stakeholders. Common approaches to evaluating social benefits have focused on economic indicators such as levels of employment, and contribution of forestry to the Scottish economy, while qualitative social scientists had provided largely descriptive accounts of the benefits of forestry to local communities through the use of specific case studies. While both of these approaches are important, and have their place in a full assessment of benefits, there was also a need to develop new and creative ways to assess social values, especially those intangible values associated with, for example, learning and education, health and well-being, landscape attractiveness, and cultural heritage. The difficulties of providing adequate and credible quantitative measures for such benefits has often led to them being undervalued in forestry decision-making when considered alongside the timber benefits of forestry. FR has approached this challenge through a combination of economic and quantitative indicators, and qualitative and descriptive analysis. It has done so by examining a number of specific 'benefit themes' of key policy relevance at a strategic level, and also by exploring the full range of cross-over benefits as experienced through everyday engagement with woodlands and forests by a range of individuals and social groups within the Scottish population.

In November 2004, the Social and Economic Research Group (SERG) at Forest Research was approached to undertake the evaluation. A scoping study was commissioned and delivered to FCS in September 2005 (Hislop and Elliott, 2005). The study began by clarifying the meaning of the term 'Forestry for People', or 'F4P' as it became known, through a series of focus groups and interviews with a range of stakeholders to ensure that the study would focus on an agreed set of objectives. A proposal to carry out the research was submitted to

FCS in November 2005, followed by a Description of Work in March 2006, which provided the basis for FCS to commission SERG to carry out the research, starting in April 2006. One of the main terms of reference was to improve upon the evidence base of the social and economic benefits of forestry in Scotland in preparation for the 2007 Comprehensive Spending Review, and in December 2006, an Interim Report was prepared to meet this need (Hislop *et al.*, 2006). The project was overseen by a steering group consisting of the FCS Head of Social Policy and representatives from the Social Policy team, and representatives of the FC's Corporate Forestry Support, the recently disbanded Forestry for People Advisory Panel, and Greenspace Scotland.

During a steering group meeting held in September 2006, two decisions were made to clarify the scope of the project. First, it was agreed that the project was more accurately described as a 'valuation' rather than an 'evaluation' since what was required was a snapshot of social and economic benefits, rather than a comparison of benefits (or outputs and outcomes) with costs (or inputs such as investments in social forestry). The valuation was to be at the national scale for Scotland, and aimed to capture the current range of values that constitute 'Forestry for People' rather than to speculate on what they might become if certain initiatives were pursued. The values were to be contextualised in certain cases by highlighting comparisons with broader sectoral statistics or other parts of UK. Furthermore, some of the data and information was seen as providing a baseline for comparison with the results of future studies, for example indicators used by FCS to monitor implementation of the Scottish Forestry Strategy (FCS, 2006).

The second decision concerned a suite of economic and quantitative indicators, structured according to a number of themes relevant to policy (see below), which would provide headline information that Forest Research would endeavour to report on. This decision helped to clarify the research agenda and the methods that should be employed and provided a reference for the commissioning managers in FC and FCS to monitor project progress. The list was discussed and refined throughout the course of the project as our shared understanding of the subject areas grew, and a final list of 30 evolved (see Table 1). Several of the indicators are economic values (e.g. the non-market value of forest recreation) and it should be highlighted that these values represent gross benefits rather than net benefits, because they do not measure the additional benefits of woodland compared to those associated with alternative land uses. The main purpose of Section 2 of this report is to present and discuss the estimates for each indicator that have been calculated for the project, together with available supplementary and contextual data and information.

A typology of social and economic benefits of forests

Economists often categorise the benefits of forestry into market and non-market values, the latter referring to those that are not fully reflected in the prices paid for goods and services. Non-market benefits of forests include open-access recreation, biodiversity, landscape amenity and carbon sequestration, as well as less researched aspects such as effects on health, air quality, water quantity and quality, and conservation of archaeological sites (Snowdon, 2009, *in prep.*).

Benefits are also typically divided into use values, such as timber and non-timber forest products, and non-use values. The latter refer to "things that we do not currently use but that we may wish to use in the future (*option value*) or pass to future generations (*bequest value*), or to things that we feel are important even if we are unlikely to experience them first-hand (*existence value*)" (Snowdon, 2009, *in prep.*). Figure 1 shows the relationship between these different types of value.

The Forestry for People study focused on the values associated with the use of the forest resource: the 'direct use' values associated in particular with timber production, and expressed as gross value added to the Scottish economy, and the values associated with 'indirect use' of woodlands, such as recreation, opportunities for education and learning, enhancement of health and well-being, and appreciation of landscape amenity and cultural heritage.¹ The latter are primarily non-market benefits, because access to the vast majority of forests in Scotland is unpriced. Most of the indicators covered by the project seek to quantify these benefits. The non-use benefits were not addressed as fully through the estimation of indicators. However, they are implicitly included within Indicator 25, 'percentage of the population who benefit from knowing that there are trees and woodlands in Scotland', and also in the case study material given in Section 3.

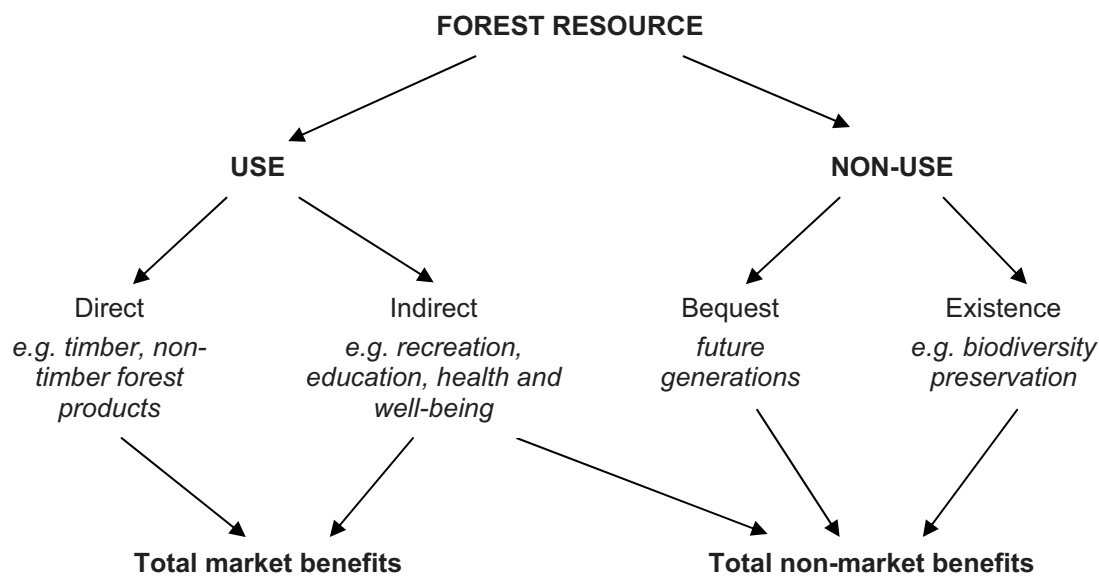


Figure 1. Values making up the total economic value of forestry (Source: Snowdon, 2009, *in prep.*)

During the Forestry for People Scoping Study it was clear that these categories of value did not reflect terms used by forestry stakeholders, and an alternative typology was developed, which was based upon five substantive themes that are embedded in the discourses of forestry policy and management, as follows: a) livelihoods (employment, volunteering, and contribution to the economy), b) education and learning, c) health and well-being, d) quality of life (recreation, amenity, culture), and e) community capacity. This list was later reorganised into seven themes and used to structure the suite of indicators. The themes are discussed in separate sub-sections within Section 2, and are listed below:

1. Employment and volunteering
2. Contribution to the economy
3. Recreation and accessibility
4. Learning and education
5. Health and well-being
6. Culture and landscape
7. Community capacity

¹ Direct and indirect use may also be referred to as 'extractive' and 'non-extractive' use (e.g. Pearce, 1999).

The thematic structure is helpful to quantify social and economic benefits at a national level, but it may not reflect the experiences and perceptions of individual visitors to woodlands, or participants in organised forest-based activities, who may derive multiple benefits from a single woodland encounter that are not always easy to define and separate from each other, or quantify through the use of indicators. Thus, the thematic (or reductionist) perspective given in Section 2 is complemented by a holistic perspective that seeks to represent the reality of multi-layered benefits experienced by the diversity of individuals and social groups in Scotland who value forests. While the former lends itself best to economic and quantitative analysis, the latter requires qualitative methods and description through case study research in different parts of Scotland. This material is given in Section 3.

Definitions and scope of themes

The scope of each of the seven themes is outlined below. Further discussion is given in the corresponding sub-section in Section 2.

1. Employment and volunteering

This theme provides estimates for levels of employment and volunteering that are associated with forestry in Scotland. The figures are separated according to type of organisation or sub-sector. The percentage of time spent by direct and contract staff, and by volunteers on different forest-related activities is also estimated.

These estimates are based upon a broad definition of the forestry sector that includes: forestry harvesting and planting; farm woodlands; haulage; primary wood processing; pulp and paper; and public sector, non-governmental organisation, and research and education employment that is associated with Scottish forests. The estimates exclude employment associated with the use of timber not grown in Scotland.

Apart from the direct employment and Gross Value Added within forestry sector businesses², there are also indirect and induced impacts. Indirect impacts are defined as impacts in businesses supplying forestry businesses with goods and services. Induced impacts are defined as impacts from spending by those who earn their incomes either directly or indirectly from the forestry sector (such as forestry workers who spend their incomes on housing, food, transportation and other consumption) which, in turn, supports employment in sectors producing these goods and services (Snowdon, 2009, *in prep*).

It would be possible to use the figures for levels of volunteering to derive an estimate of the cost saving to respective host organisations, although this has not been attempted here, partly because the 'forestry for people' benefits of volunteering were considered to be primarily those experienced by the volunteers themselves and the communities that they work in. For this reason, the research into volunteering could have also been reported within several other themes in the report, such as community capacity, learning and education, and health and well-being.

Available information on the quality of employment in different sectors and activities is also presented. As with all themes, further assessment of quality of employment, derived through the case studies, is presented in Section 3.

² By this it is meant the total employment and GVA in the sector (i.e. more than just direct impacts associated with changes in final demand).

2. Contribution to the economy

The contribution of forestry to the Scottish economy is assessed in this report primarily through an estimate for the Gross Value Added (GVA) of forest products and services that can be attributed to Scottish forestry (i.e. excluding imported timber). GVA is a measure of the contribution to the economy of each individual producer, industry or sector in the United Kingdom. It is the difference between the value of goods and services produced and the cost of raw materials and other inputs which are used up in production.

In addition, the project sought to provide a measure for the contribution of forestry to local economies, since this was seen to be an important part of what is meant by 'forestry for people'. Thus, estimates were provided for the GVA of forest-related spending (by visitors whose primary purpose is to visit woodland) and forest-associated spending (by visitors to the countryside in general, where woodland is a secondary incentive for the visit). 'Average distance travelled to work' was considered, but later rejected, as a possible proxy for the proportion of income that is spent locally by forestry sector employees.

3. Recreation and accessibility

This theme is concerned with levels of use of forests for any recreational purpose, in particular the percentage of Scottish residents visiting Scottish woodlands each year, and the numbers of visits that they make. Together, these figures provide a simple quantification of the benefits associated with accessibility of woodlands for recreation. When considered in isolation, they imply that all visits by all people are of equal value. To take the assessment further, differences in visitor and visit numbers between social groups are examined, as well as numbers of visits which involve different recreational activities, such as mountain biking, dog walking and picnicking.

The estimates of visit numbers are then used as the basis for assessing the non-market value of access for recreation in Scottish forests. Additional data on public perceptions of accessibility and the value of forest recreation is also presented.

4. Learning and education

Learning is defined here as the cognitive process of acquiring skill or knowledge, while education is the imparting and acquiring of knowledge through teaching, especially in schools and similar institutions. The latter is assessed in this report primarily through numbers of children in Scotland who have visited Scottish woodland in the previous 12 months as part of a formal educational visit. The report also draws on recent evaluations of Forest School and other educational initiatives, and evidence from the two case studies, to highlight the range of benefits experienced by participating children.

An assessment of the numbers of people benefiting from informal learning in a woodland setting is more difficult to derive, and has been partially fulfilled by this project with data on the number of public events organised by FCS and levels of participation, where the primary purpose of the event was 'informal learning', such as fungi forays, wildlife walks, and forest-related stalls at agricultural shows. Levels of awareness and learning about forestry were also assessed in the study by estimating the percentage of the population who had seen or read about Scottish forests in the media in the previous 12 months, and the topics that were recalled.

5. Health and well-being

The World Health Organisation (2003) defines health as a "state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". The dual

focus in this theme on physical health and mental well-being reflects this broad definition. The study assessed overall benefits by estimating levels of participation in organised forest-based health events at national level and events organised by FCS. Economic impacts were assessed using an estimate of levels of exercise in forests in Scotland. Impacts on mental well-being were tentatively assessed using research which shows that levels of anxiety and depression are lower among people who live close to woodlands and greenspaces, and by calculating the proportion of the Scottish population who live a certain distance from a woodland.

6. Culture and landscape

This theme is concerned with three related types of benefit:

- a) The cultural values that the public associates with forests in Scotland.
- b) The contribution forests and woodlands make to the quality of landscape and place in rural and urban environments.
- c) Non-use values that people derive through knowing that forests exist in Scotland for the benefit of current and future generations.

This study proposes the following typology of cultural values: a) sites and features; b) activities, practices, skills and events, and c) meanings, identities and representations. The typology is elaborated further under the 'culture and landscape' theme in Section 2. 'Culture' within the forestry sector is often limited to 'cultural heritage' and the preservation of ancient monuments that are located within forest. This project sought to broaden the scope of the theme to include contemporary forest-related cultures, for example artistic performances, and the culture that surrounds recreational activities such as mountain biking.

Whether or not they actually visit woodlands, many people benefit from seeing woodlands and trees in the Scottish landscape from their homes, places of work, or while travelling. The proportion of the population who benefit in this way is assessed in this report through a household survey, and a tentative economic value is proposed. Such benefits are typically reflected in local property prices, which can be used, through hedonic pricing methods, to measure economic impact of trees and woodlands on the quality of place, for example in areas undergoing economic regeneration. The values are difficult to apply beyond the case study level, and no national level estimates were obtained as part of this study.

Benefits can also be derived simply by knowing that woodland and forests exist in Scotland, either for present or future generations to appreciate. By measuring the proportion of the population who support such a view, assessments can be made of the scale of a combination of use and non-use values, including bequest and existence value.

7. Community capacity

Community capacity is defined broadly in this study to cover a number of inter-related qualities, such as community pride, empowerment, cohesion, engagement, stability, resilience and integration. The focus here is on qualities or assets of social groups and networks rather than of individuals. Many of these terms are captured by the concept of social capital, which combines two discrete elements: social connectedness, and norms of trust and reciprocity (Putnam, 1993). The point is often made that social capital, and thus community capacity, may facilitate co-ordinated actions which in turn may improve the ability of communities, or society more broadly, to meet shared needs, respond to threats, create and take advantage of opportunities, and produce desired outcomes (Donoghue and Sturtevant, 2007).

It is difficult to assess the contribution of forestry to community capacity at a national level, since available indicators provide only a limited perspective on this complex area of social value. Measures that are reported here include the percentage of the Scottish population who have been involved in or consulted about forestry plans, and the percentage who associate forests in Scotland with a series of relevant values such as 'trust' and 'sense of belonging to your community'.

A key area of forestry in Scotland that is seen to enhance community capacity is the community woodland movement, and the report presents a substantial body of new data on community woodland groups in Scotland, including number of groups, levels of participation, area of forest resource under community management, and level and sources of income. While these groups probably manage less than 2% of the Scottish forest estate, investment in the sector is seen by many stakeholders as a way to enhance delivery of social outcomes by the Government.

Distribution of benefits across Scottish society

An important perspective on social value, which does not fit easily into the thematic structure adopted by the study, concerns the distribution of benefits across society. This can be measured through levels of participation in different activities and in different forms of decision-making relating to forests, according to different social groups. A particular focus needs to be made on socially-excluded groups that may be under-represented among the beneficiaries of different activities, such as the elderly, people with disability, women, and members of black and minority ethnic groups.

Increasing public participation is typically seen instrumentally as a means to:

- a) Enhance public awareness of forests and forestry.
- b) Open up new possibilities to enhance forest-related goods and services.
- c) Share costs and benefits of forest management fairly and equitably.
- d) Enhance the social acceptance of sustainable forest management (MCPFE, 2002).

Participation may also empower individuals and communities, leading in turn to greater human and social capital.

In this study, participation in forest-related activities that provide social benefits is measured explicitly through several indicators in each theme, such as 'number of visits' and 'number of participants in organised events', and 'numbers of volunteer days'. The study also provides a simple measure of participation in forest-related governance at a national level by assessing levels of consultation on forest plans. Where possible, values are broken down for all indicators according to gender, age, ethnicity, socio-economic group, deprivation using the Scottish Index of Multiple Deprivation (SIMD), and whether the respondent was a rural or urban resident.

Socio-economic group was measured with the five point 'social grade' scale based upon the occupation of the head of the household that is most commonly used in market research, as follows:

- | | |
|----|---|
| AB | Higher and intermediate managerial, administrative or professional |
| C1 | Supervisory or clerical and junior managerial, administrative or professional |
| C2 | Skilled manual workers |
| D | Semi-skilled and unskilled manual workers |
| E | Casual or lowest grade workers, pensioners and others who depend upon the state for their income (NRS, 2009). |

This data begins to address the evidence required for the forestry sector to respond to the Government's social inclusion agenda, and new diversity and equality legislation including the Disability Discrimination Act 2005 and the Race Relations (Amendment) Act 2000. Previous surveys and qualitative research have suggested that black and minority ethnic (BME) groups do not use woodlands and the countryside in numbers proportionate to their numbers in society (e.g. Countryside Agency, 2004; OPENspace, 2006). However, it was difficult to provide substantial new evidence of BME under-representation among woodland users in Scotland based on the F4P Omnibus Surveys commissioned for the project because the small sample sizes, and the low proportion of the population who belong to BME groups in Scotland (2%), mean that differences between BME and non-BME respondents were rarely statistically significant.

Table 1. The ‘Forestry for People’ indicator framework

Theme	Indicator
Employment and volunteering	1. Number of people employed in forestry
	2. Number of full-time equivalent jobs in forestry
	3. Number of full-time equivalent jobs due to forest-related and forest-associated visitor spending
	4. Number of volunteers and volunteer days associated with forestry
	5. Percentage of time spent working and volunteering on different forest-related activities
	6. Percentage of forestry employees who are satisfied with their job
Contribution to the economy	7. Gross Value Added of forest-related and forest-associated spending
	8. Gross Value Added of forest products and services
	9. Public perceptions of the contribution of forestry to the economy
Recreation and accessibility	10. Number of visitors and visits to forests
	11. Percentage of visits involving different activities
	12. Non-market value of visits to forests
	13. Number and purpose of forest-related public events
	14. Public perceptions of forest-based recreation and accessibility
Learning and education	15. Percentage of the population involved in organised forest-related learning activities
	16. Percentage of the population who have seen or read about Scottish forests, woodlands and trees in the media
	17. Public perceptions of the learning and education benefits of forests
Health and well-being	18. Percentage of the population involved in organised forest-based health activities
	19. Economic impacts of forest-based health activities
	20. Impacts of forests on mental well-being
	21. Public perceptions of the health and well-being benefits of forests
Culture and landscape	22. Number of forest-based cultural events, activities and sites, and number of visits
	23. Value of forest landscapes to the Scottish population
	24. Public perceptions of the cultural and landscape benefits of forests
	25. Percentage of the population who benefit from knowing that there are trees and woodlands in Scotland
Community capacity	26. Number of community woodland groups, number of members and levels of involvement
	27. Hectares of woodland managed by community woodland groups
	28. Incomes of community woodland groups
	29. Number of people involved in, or consulted about, forestry plans
	30. Public perceptions of the community capacity benefits of forests

1.2 RESEARCH ACTIVITIES AND METHODOLOGY

Introduction

The ambitious goal of providing a comprehensive valuation of the full range of economic and social benefits from forestry, forests and woodlands, accrued by the people of Scotland, presented numerous methodological challenges. To realise this aim the project required an interdisciplinary team of ten researchers, and additional contracted specialists, including economists, statisticians, anthropologists and social geographers, all of whom specialise in the forestry and land use sectors. The approach developed to conduct the research combined the following methods:

1. Economic analysis of market and non-market benefits associated with forestry
2. National Omnibus surveys of adults resident in Scotland
3. Viewshed analysis to quantify levels of visibility of forests from residential areas³
4. Survey of 'Forestry for People' activities undertaken by forestry organisations
5. Two qualitative case studies, in the Loch Ness and Glasgow and Clyde Valley areas
6. Literature and data searches

Economic analysis

Market and non-market benefits of forestry in Scotland

Two related studies on market and non-market benefits of 'Forestry for People' in Scotland were commissioned by competitive tender.⁴ The first study, on visit-related benefits, aimed to quantify:

- the non-market value of public access (visits) to forests
- income and employment impacts, and Gross Value Added, attributable to the associated tourism and recreation visitor spending
- the value of health benefits associated with visits (including both benefits to individuals and savings to the National Health Service)

The second study, on wider benefits, aimed to explore and quantify, where feasible, non-market benefits associated with:

- Amenity (i.e. landscape attractiveness)
- Health (unrelated to forest visits, e.g. due to absorption of particulates)
- Education
- Culture (e.g. cultural events and sites)
- Community capacity (e.g. social capital)

The draft final report, which combined the outputs of both contracts, provided material that was used for several sections in this report. Monetary estimates are provided in all chapters except for educational, cultural and community capacity benefits, for which no existing estimates or suitable data sources were found. The first study used a conventional economic approach to valuation that may be regarded by some researchers as too narrow, and takes a

³ A viewshed is an area of land, water or other environmental element that is visible to the human eye from a fixed vantage point (see: <http://en.wikipedia.org/wiki/Viewshed>).

⁴ Based partly upon their expertise and previous work in the area, CJC Consulting Ltd, in collaboration with Prof. Ken Willis of the University of Newcastle-upon-Tyne, were selected to undertake both contracts.

conservative approach to valuation. However, by drawing upon data and analysis provided by Forest Research, the study incorporates some significant innovations. For example, the study provides what are believed to be the first ever estimates of the physical health benefits associated with visits to forests in Scotland, based upon questions that had previously been included for this purpose in the F4P Omnibus Survey (TNS, 2006a). Visual amenity estimates in the final report draws upon GIS based analysis of viewshed data undertaken by Forest Research.

Economic regeneration

A scoping paper was commissioned to explore the extent to which forests contribute to economic regeneration (Dawson, 2006). The aims included to:

- clarify how forestry influences economic regeneration
- identify existing estimates, information and data sources
- explore the feasibility of quantifying the influence of forestry, estimating income and employment impacts and associated Gross Value Added
- record costs and benefits of economic regeneration projects in the forestry sector
- outline options for further research

The report uses a broad classification of economic regeneration indicators, covering business start-ups and expansion, commercial and domestic relocation, and uplift of commercial and domestic property prices. Despite the broad approach to economic regeneration and its application to the whole of Scotland rather than solely to once prosperous areas now experiencing high unemployment or social deprivation, the study identified little firm evidence of the impacts of forestry. Many organisations contacted indicated that they hold no such information, or did not respond to enquiries. The study highlights some of the difficulties and complexities in attempting to quantify the impacts of forestry on economic regeneration. Indicative estimates for employment and GVA impacts provided must be treated with great caution due to the tenuous nature of extrapolations used and evidence on which they are based. For example, Dawson (2006: 30) argues that there is insufficient evidence for accurate estimates of employment impacts of forestry on regeneration to be made, but suggests that these could be larger than employment in the forest industry itself. For this reason, as well as to avoid overlap with estimates of the indirect and induced impacts of timber production and processing, and other aspects such as amenity values, they have not been included in the main text of this report.

Assessment of the wild moss harvest

As part of assessments of the value of non-timber forest products (NTFPs) in Scotland, a small financial contribution was made to a study being conducted as part of an MSc dissertation to estimate the extent and value of the wild moss harvest in Scotland (Staddon, 2006). Staddon's work was based on telephone, postal and email questionnaire surveys with 308 harvesters, traders, land owners, bryologists and other key informants.

The study provided new, mainly qualitative, information on the wild moss harvest. While managing to produce estimates on revenue flows and employment associated with the harvest of wild moss, the study demonstrated the difficulty of attempting to quantify the extent and value of activities associated with NTFPs. In a sector made up of small and medium size enterprises, the main difficulties were identification of harvesters and traders and obtaining information from traders, partly because they often employ people on a casual and/or seasonal basis. Also, moss harvesting is only a small part of their overall activity, and moss is gathered in non-woodland as well as woodland situations. These constraints mean that Staddon's figures must be treated with caution. The findings also question the

usefulness of a conventional survey-based approach to valuing revenue flows and employment associated with the commercial sale of NTFPs. New and more effective methodologies should be considered for any future assessments of this sector.

Omnibus surveys

Two questionnaire surveys were commissioned for the project, using representative samples of the adult population (people aged 16 years or over) resident in Scotland, and using sample sizes of 1,015 in 2006 and 998 in 2007. The surveys were contracted to TNS Travel and Tourism, and carried out as part of two Omnibus surveys that ran from 24–29 August 2006 and 22–28 August 2007. They are referred to in this report as the 'F4P Omnibus Surveys 2006 and 2007' (TNS, 2006a and 2007).

Interviews were undertaken in the homes of respondents across Scotland using Computer-Assisted Personal Interviewing (CAPI). Face-to-face interviewing has the ability to provide high quality data from the interactions between the interviewer and the respondent. CAPI also increases accuracy of the data gathered due to the way in which questions and answers are routed. Interviewing was undertaken at 42 sampling points in Scotland, which were selected by TNS to be representative of the geographical distribution of the Scottish population. In each of these sampling points, interviewers aimed to complete 25 interviews. The sampling strategy was a non-probability quota applied on the basis of age, gender, socio-economic group and working status.⁵ The data collected was then weighted according to profiles based on the age, gender, socio-economic group and working status of the Scottish population.

The questionnaires for the two surveys were developed in consultation with FR researchers and members of the project steering group, and are given in Annex 4. For the 2006 Survey, individual questions were designed to provide insights into each of the Forestry for People themes, including visit numbers, levels of participation in forest-based activities, and perceptions of the value of woodlands across the whole Scottish population including both forest users and non-users.

The 2007 Survey asked new questions to develop understanding, or provide more accurate estimates, for particular themes. It also repeated some questions to examine the variation in responses between years. In particular, the estimate for the number of visits to woodlands in the previous 12 months was improved upon. In 2006, respondents were asked to locate themselves within particular frequency classes such as 'several times a week'. In 2007, the Survey went further by asking informants to answer this question, and then to provide precise frequencies so that each frequency class could be interpreted more accurately. The results generated much higher estimates, and are discussed under the 'recreation and accessibility' theme in Section 2. The 2007 Survey also derived percentages of visits to forests that involved each of 15 different recreational activities. Further questions allowed an estimate of the number of visits by children (under 16 years) to be derived, and levels of participation by children in trips to forests organised by schools educational institutions.

⁵ A non probability sample is one in which the selection of respondents is based on factors other than random chance. As a quota sample does not permit measurement of the likelihood of members of the population being included in the survey, any confidence intervals that are applied to the data can only be roughly estimated. Statisticians from TNS Travel and Tourism, who carried out the surveys on behalf of the project, recommended that a design factor of 1.5 should be applied to all such estimates, meaning that confidence intervals should be widened by 50%. For example, of the 1,015 people surveyed as part of the Survey in 2006, 56% stated that they had visited woodlands in the previous twelve months. Previously, we would have said with 95% confidence that between 53-59% of the adult population visited woods in the 12 months prior to the Survey, but using the recommendation of TNS the range increases to 51-61%. For specific sub-groups such as male and female, or age groups, the range of uncertainty will be higher as the sample sizes will be smaller.

Viewshed analysis

The Woodland Surveys Unit of Forest Research's Biometrics Division undertook GIS analyses allowing estimates to be derived for the following:

- a) the number of people in Scotland who have accessible woodland close to where they live
- b) the number who can potentially view woodlands from where they live

The methods used for each analysis are outlined below. The results were then used to propose tentative estimates in two different themes: under the 'health and well-being' theme, an economic value is proposed for the impact of forest views on mental health in Scotland, and under the 'culture and landscape' theme a value is given for the contribution of forests to visual amenity of the Scottish landscape.

The analysis of the numbers of people who live close to accessible woodlands was based on the Woodland Trust Space for People dataset, with the National Inventory for Woodland and Trees (NIWT1) dataset used to provide the FCS legal boundary data for the FC estate. The NIWT database is considered to provide a more accurate indication of the relationship between people and woodlands because FCS legal boundaries include large areas of open hill land, whereas the NIWT data excludes open land.

A population dataset was used that identifies all settlements of 500 people or more throughout Scotland.⁶ Boundary zones were drawn around the accessible woodland dataset at 300 m and 1 km, and where these zones intersected with the settlement dataset the proportion of the settlement area intersected was used to estimate the numbers of people within the settlement who are within a boundary of accessible woodland.

The analysis of the numbers of people who can potentially view woodlands from where they live was based on a viewshed analysis from urban settlements. The same settlement dataset was used as that for the accessible woodland analysis. The NIWT1 database⁷ covers forest/woodland that has a wooded area of a minimum size of 2 ha and greater than 20% cover by tree crowns. Only woodland 'visible within a specific radius' of an urban area as identified in the original GIS viewshed analysis was used.⁸

After the woodland had been zoned by 300 m and 1 km boundaries, an internal boundary of 50 m on the outer edge of each urban area was produced. This boundary size approximates to a typical row of houses with gardens found at the edge of urban areas. It is assumed that households in the second row of houses will not have the same uninterrupted views of woodland (upon which the visual amenity estimates are based). However, choice of a narrow 50 m buffer aimed at preventing other houses from interrupting views of woodland does not preclude the possibility that farm or other buildings located outside urban areas may occasionally appear within the view, and to the extent that some of the views are interrupted, the precise impact this has on the value placed on these views is unclear. Views of inner city woodlands (which account for a relatively small proportion of the total) are more likely to be interrupted, but may also be valued more highly.

⁶ This was an FCS spatial dataset derived from 1991 Census tabulated data joined with Ordnance Survey urban polygon data (spatial data). This process has not been completed for more recent census data. By mid-2006 the total population of Scotland had increased by 12.5% compared to 1991. Therefore the values of forest landscapes derived by this study are likely to be under-estimates.

⁷ See: [www.forestry.gov.uk/pdf/niscotland.pdf/\\$FILE/niscotland.pdf](http://www.forestry.gov.uk/pdf/niscotland.pdf/$FILE/niscotland.pdf)

⁸ A 3 km radius around urban areas was used to identify the relevant woodland, in order to support the data needs of CJC Consulting when preparing the initial estimates for this project.

The intersections of these boundaries (woodland and urban) were then identified. Finally, the relative population of the urban centre with 'actual' visibility of woodland was derived as the proportion of the total population. The proportion was equal to the ratio of the intersections' size to the total area size of the urban centre.⁹ Further analysis to identify any inner urban woodland not included in the initial analysis was performed.¹⁰ There were only 12 such areas identified and all were in Glasgow. For these cases the area of the woodland was used to derive approximate estimates of the number of households with woodland views.

Survey of 'Forestry for People' Activities

In 2007, a questionnaire survey was undertaken to gather primary data from a broad range of forestry and environmental agencies in Scotland on levels of activity of relevance to the seven 'forestry for people' themes. The survey is referred to in this report as the 'F4P Survey of Activities'. Six sectors were included:

- Forestry Commission (FC)
- Public agencies (other than FC)
- Local authorities
- Community woodland groups (CWGs)
- Non-governmental organisations (NGOs)
- Private woodland owners

In order to minimise the administrative burden of surveys on businesses and government, it was decided not to include forestry companies in the survey since much of the information being sought could be obtained through other surveys undertaken by FC's Economics and Statistics section (see 'Literature and data sources' below). Instead, a sample consisting of the top ten companies in Scotland was identified and approached by email to provide indicative levels of 'forestry for people' activity.

Different versions of the questionnaire were prepared for each sector (see Annex 3 for sample questionnaires). All sectors were asked a number of common questions to provide the data required to calculate the following estimates:

Numbers of people and full-time equivalent jobs (FTEs) employed to carry out woodland-related activity in Scotland (both direct and contract employment) during the previous 12 months.

Numbers of volunteers working on woodland-related activity in Scotland and number of volunteer days during the previous 12 months.

Percentage of time spent (by direct and contract employees, and volunteers) on each of ten different types of woodland-related activity, categorised into a) social forestry activities and b) other activities, i.e. economic, environment and administration, during the previous 12 months, as given in Table 2.

⁹ The population density may be less at the periphery of major urban areas, which may lead to an over-estimate of the visibility of woodland. On the other hand, households on hillsides beyond the 50 m buffer and in multi-storey accommodation may have woodland views and are not covered by the estimate derived in this report. Smaller woodland and smaller settlements are also excluded. On balance the estimate is considered to be conservative.

¹⁰ The initial analysis was based upon any woodland within 1 km or 300 m of the urban boundaries.

Table 2. Activities of organisations covered by the Survey of Activities

Activity	
Economic, environment and administration activities	Organisational support
	Woodland management
	Harvesting and processing
	Biodiversity and wildlife
Social forestry activities	Recreation and access
	Formal education
	Informal learning
	Health and well-being
	Cultural activities
	Public involvement

The sample questionnaire given in Annex 3 provides definitions of each activity. The selection of the ten categories of activity was based upon discussion with FR researchers and steering group members, and took into account the project themes. While a number of variations on these categories could have been chosen, it was considered that this selection was the best way to meet the reporting needs of the project, and could be used to categorise any forest-related activity carried out by any organisation covered by the Survey. The choice of a round figure of ten items simplified the respondents' task of allocating percentages of time spent on each category.

For the FC, the survey was restricted to Forest Districts and Conservancies, as they comprise the main 'frontline units' within the organisation. For estimates of the proportion of time spent working or volunteering on different activities, it was assumed that the data for Forest Districts and Conservancies were representative of other parts of Forest Enterprise Scotland and FCS respectively, while weighted averages were used to represent proportions of time spent on different activities carried out by Forest Research in Scotland.

Additional questions were asked of Forest Districts and Conservancies to derive estimates of the annual number and the purpose of public events that have been organised by the FC, and the number of people who attend those events annually. This was not carried out for other sectors to reduce the administrative burden on them. It would have also resulted in a degree of double counting since such events typically involve more than one partner. The data on events has been used for a number of themes in Section 2, but is presented in full in Tables 32 and 33 under 'recreation and accessibility'.

For community woodland groups, the survey asked additional questions which were considered by steering group members to be of particular interest to assess the 'social forestry sector' in Scotland. Thus, estimates were derived of the: numbers of groups; numbers of members; numbers of directors by gender, age, ethnicity, and disability; numbers of woodlands and hectares managed; degree of community control; income from different sources; and the extent to which funding had been secured over the coming three years. The Community Woodland Association (CWA) kindly assisted by sending the questionnaires to their members on behalf of Forest Research and by encouraging responses through their newsletters. All other community woodland groups, for example a number of partnerships with the FC, were contacted directly by Forest Research.

For private woodland owners, only those that had received grants of more than £1,000 from the Scottish Forestry Grant Scheme for two categories of grant, 'recreation' and 'community involvement', were sampled. It was assumed that there would be negligible levels of the social forestry activity that was of primary interest to the project being carried out by those who had not received a grant since the scheme's inception.

For NGOs, an additional question was asked to determine the percentage of organisations within seven different categories of woodland ownership and use. The results are given in Table 3, which provide a profile of NGOs in Scotland whose work involves significant levels of forest-related activity. Note that the total percentage is greater than 100%, because many NGOs use different woodlands in different ways. On average, each NGO identified itself as belonging to 1.7 of the seven categories.

Table 3. Ownership and use of woodland by NGOs in Scotland that carry out forest-related activity

Category of ownership or use	Percentage (weighted average)
Ownership of woodland in Scotland	22
Lease of woodland owned by FCS	5
Lease of woodland in Scotland owned by another agency (i.e. not FCS)	16
Management of woodland owned by FCS	14
Management of woodland in Scotland owned by another agency (i.e. not FCS)	8
Use of woodland owned/managed by FCS	38
Use of woodland in Scotland owned/managed by another agency (i.e. not FCS)	46
No direct use of any woodland in Scotland	22
Total	170

In total, 486 agencies were approached in the Survey, and the overall response rate was about 31% (unweighted average), as shown in Table 4.

Several headline indicators required estimates of totals, such as numbers of volunteers and numbers of members of community woodland groups, and this required totals derived directly from respondents' questionnaires to be multiplied up to cover the known number of agencies in each sector. Different factors were used for different sectors. Experience with other surveys suggests that the results that were derived from respondents to the survey are likely to differ significantly from the results that would have been derived from non-respondents. This problem was reduced by stratifying the agencies in each sector, for example into different size classes, and multiplying up the results for each class separately, or in some cases where the data for a given class is believed to be uncharacteristically high it was simply added to the total and not rated up.

Table 4. Numbers of agencies and recipients, and response rates, for each sector covered by the Survey of Activities

Sector	Known number in sector	Recipients	Respondents	Response rate (%)
FC in Scotland				
Forest Districts	14	14	14	100
Conservancies	5	5	5	100
Community woodland groups				
Community Woodland Association (CWA) members	83	83	30	36
CWA umbrella groups	5	2	2	100
Non-CWA members	50	50	16	32
Non-governmental organisations				
NGOs with over 1,000 volunteer days	4	4	4	100
Other NGOs	145	145	33	23
Local authorities				
Local authorities: city	4	4	3	75
Local authorities: non city	28	28	7	25
Public bodies	17	17	4	24
Forestry companies	10	10	8	80
Private woodland owners				
Grants of £1,000 to £10,000	92	46	8	17
Grants over £10,000	69	69	17	25
Research organisations	9	9	0	0
TOTAL	535	486	151	31

The different sectors were treated as follows:

All FC Forest Districts and Conservancies responded to the Survey. It was assumed that there were no contractors or volunteers working within FCS outside these units. Numbers employed and FTEs for direct employment were derived through the FC employment database (at 31 October 2007). To derive percentages of time spent on different forest-related activities, the percentages for Forest Districts were assumed to be representative of all units within Forest Enterprise Scotland, while the percentages for Conservancies were assumed to be representative of all units within FCS. The number of FTEs within Forest Enterprise Scotland and FCS, obtained from the FC employment database, were used to weight the percentages quoted in the report for each activity.

Community woodland groups were divided into CWA and non-CWA members and the figures for each category were multiplied up separately to estimate figures that would have been obtained had there been a 100% response rate. A small number of umbrella organisations were treated as individual groups, and the data provided by respondents was added to the total without multiplying up.

Non-governmental organisations with unusually high figures for numbers of volunteer days were treated separately, and the available data was added to the total, while data for the remaining majority of NGOs who responded was multiplied up.

Local authorities were divided into urban and rural councils, and multiplied up separately for all statistics quoted in the report.

Public bodies were multiplied up without stratification since there were no outliers that suggested the need for two separate classes.

Forestry companies were included in the survey by eliciting indicative information by email from the top ten companies in Scotland. Eight companies responded with information and data, which was not multiplied up because it was assumed that insignificant levels of social forestry activity were likely to be taking place within all smaller companies.

Private woodland owners that were surveyed had all received grants under the Scottish Forestry Grant Scheme for 'recreation' and/or 'community involvement' and were stratified according to size of grant.

Case studies

In addition to the methods employed at a national level, the valuation included two case studies: the Loch Ness region, and Glasgow and Clyde Valley. The purpose of the case studies was to explore the economic and social benefits as experienced in the day-to-day lives of individuals and communities in two contrasting regions, and also to engage critically with the thematic structure of benefits employed elsewhere in the project. Through a range of qualitative research methods, an exploration of benefits was carried out. The principal aims were to:

- provide in-depth, context-specific, 'bottom-up' explorations of 'Forestry for People' benefits and values from the perspective of the 'lived experience' of local stakeholders
- explore the relationship between different types of benefits and values
- cross-check and where appropriate verify the results of national-level research
- understand how, and to what extent, forestry contributes to community and personal development in two contrasting parts of Scotland

Research in the case studies was divided into two phases as follows:

Phase One: The two case study regions were profiled in order to provide a working knowledge-base from which subsequent research could be designed and implemented. The profiling work involved mostly desk-based research and some 'scoping' interviews with key stakeholders.

Phase Two: Focus groups and semi-structured interviews with a range of stakeholders were used to explore the range and nature of 'Forestry for People' benefits accruing to stakeholders, and the relationship between different benefit types. See Section 3 for further information on the case study methodology and profiles of the two case study areas.

Literature and data searches

Relevant information and data was obtained from existing sources to supplement and contextualise the results generated by the Forest Research team. Sources included internet searches, journal resources, unpublished reports and professional networks. A substantial body of qualitative social research, including work carried out by SERG, was reviewed to support the development of the project and preparation of the final report.

Limited data was available for the majority of the indicators. However, the Office for National Statistics (ONS) possessed some data on Gross Value Added (GVA) for different forestry sub-sectors, which they obtained through the Inter-Departmental Business Register (IDBR) and Annual Business Inquiry (ABI) surveys.

Data was also obtained on FTEs and GVA for timber production and processing from the office of the Economic Advisor at the Scottish Government. Data on the number of FTEs for timber and game was obtained through existing reports (FC, 2001 and PACEC, 2006).

For the indirect and induced FTEs, and GVA (for timber), estimates were based upon Scottish Government Input-Output analysis, and revised estimates of direct FTEs and GVA were obtained from the Forest Employment Survey (FC, 2001) and the Scottish Input-Output Tables for 2004. The methodology is described in more detail under the 'contribution to the economy' theme.

Existing studies were also used to report data on job satisfaction in forestry, in particular ORCI (2005) and Rsk Era Ltd. (2001).

SECTION 2: THEMATIC RESEARCH

2.1 EMPLOYMENT AND VOLUNTEERING

KEY FINDINGS

The total employment (i.e. direct, indirect and induced) in the Scottish forestry sector associated with the use of Scottish timber is estimated to be 13,200 full-time equivalent (FTE) jobs. This is made up of 10,300 FTEs for direct employment, 1,500 FTEs for indirect employment, and 1,400 FTEs for induced employment. The figure for direct employment equates to around 12,000 jobs, since not all employment is full-time. These estimates are based upon a broad definition of the forestry sector that includes: forestry harvesting and planting; farm woodlands; haulage; primary wood processing; pulp and paper; and public sector, non-governmental organisation, and research and education employment that is associated with Scottish forests. The estimate excludes employment associated with the use of timber not grown in Scotland.

In addition, the total employment due to first-round (direct) spending from tourism and recreation attributable to woodland, where woodland was the primary reason for the visit, is estimated to be around 17,900 FTE jobs.

The number of volunteers in forest-related work in Scotland is estimated to be around 7,500, while the number of volunteer days in the 12 month period from mid-2006 to mid-2007 is estimated to be around 47,400.

BACKGROUND

Forestry can play a significant role in the provision of employment in both rural and urban areas to help retain and enhance local skills, especially among the young, and hence help to strengthen local economies. The Scottish Forestry Strategy, through its key theme of Business Development, outlines FCS plans to “encourage recruitment and retention into the forestry sector by promoting forestry careers and exploring how to make jobs attractive, multiskilled and offering development potential”. It also proposes that FCS should “Work with Lantra (Sector Skills Council) and the forest industry to develop work experience opportunities for secondary school pupils, and explore the potential of a land based vocational curriculum” (FCS, 2006). As a contribution to the evidence base required to support these aims, this section of the report focuses on new estimates for levels of employment in the forestry sector, broadly defined, both in terms of numbers employed and FTEs (Indicators 1 and 2).

According to the Scottish Government: “Volunteering is the giving of time and energy through a third party, which can bring measurable benefits to the volunteer, individual beneficiaries, groups and organisations, communities, environment and society at large. It is a choice undertaken of one’s own free will and is not motivated primarily for financial gain or for a wage or salary” (Scottish Executive, 2004a: 1). This definition highlights the need to assess volunteering in terms of its multiple social, economic and psychological benefits to volunteers and to society rather than as a substitute for paid employment that supports the national economy. According to Volunteer Development Scotland: “volunteers make a substantial

contribution to life in Scotland through engaging with voluntary, community and public sector organisations, and by being active in their own communities of interest and place. This contribution has an important role to play in helping to shape Scotland as an active, successful and socially just society” (Volunteer Development Scotland, 2003: 1).

Volunteering is seen as a means to address a range of Scottish Government priorities. The key aim of the new FCS policy on volunteering is to “use volunteering to contribute to improved health and well-being of people and their communities” (FCS, 2007e: 1). The Scottish Executive report on environmental volunteering to deliver Scottish Government policies highlights how the environment is a common factor that can have particular appeal, giving people a chance to connect or reconnect with nature, to understand nature better, and contribute to its management. Individuals who volunteer in the environment can also gain new skills, improve their social networks by meeting people, as well as improve their physical and mental well-being (Scottish Executive, 2007a). The report also outlines how volunteering in the environment can lead to a greater sense of ownership and contribute to sustainable futures for local communities. In response, the Scottish Government highlighted the need to develop a more strategic framework for environmental volunteering, and in mid-2007 funding of £250,000 was announced in Parliament to encourage more volunteers to become involved in environmental projects (Scottish Executive, 2007b).

At a national level, the simplest way to assess the benefits of volunteering is in terms of numbers of volunteers and volunteer days associated with woodlands in Scotland that is carried out in a formal setting, i.e. for groups, clubs or organisations rather than by independent individuals (Kitchen *et al.*, 2006; Low *et al.*, 2007). These estimates are given under Indicator 4, below. For the purposes of this project, woodland-related volunteering is defined broadly to include the ten activities listed in Table 2, and these categories are used to sub-divide total volunteer and employment time, as part of Indicator 5, to understand better how volunteering is distributed within the forestry sector.

INDICATOR 1: NUMBER OF PEOPLE EMPLOYED IN FORESTRY

The total number of people employed in the forestry sector in Scotland is estimated to be around 12,000 (excluding the Non-Timber Forest Product sub-sector which is discussed below). This figure was developed from estimates for different sub-sectors, as shown in Table 5. Where data on numbers employed was not directly available for a given sector, conversion factors have been used to derive a figure by multiplying up from the corresponding figure for full-time equivalent jobs (FTEs) given below as part of the calculations for Indicator 2.

Table 5. Numbers of people and FTEs directly employed in Scottish forestry, by sub-sector Input Output Code (IOC) showing factors used to calculate numbers employed

Sector	FTEs	Factor	Numbers employed
Forest planting and harvesting			
Forestry Commission (FC) direct employees	1,205		1,479
FC contractors (except haulage)	340	1.10	374
FC contractors (haulage included in IOC 2)	2	1.10	2
Private (non farm) woodland owners	2,388	1.10	2,627
Forestry companies and contractors	1,806	1.10	1,987
Sub-total	5,741		6,469
Other sectors			
Farm woodland (1)	646	2.00	1,292
Haulage (94)	542	1.20	650
Wood processing (31)	2,577	1.02	2,629
Pulp and paper (32)	350	1.00	350
Local authorities (115)	207		580
Membership organisations (120)	85	2.61	222
Research and education (116)	105	1.10	116
Sub-total	4,512		5,839
TOTAL	10,253		12,307

The figure for numbers employed by FCS (1,479) was obtained directly from the FC employee database on 31 October 2007.¹¹ Similarly, the estimate for numbers employed by local authorities was derived directly from the F4P Survey of Activities. All the other estimates for numbers employed are based upon scaling-up the estimates for the FTEs. For membership organisations, numbers employed was estimated by applying the proportion of numbers employed to FTEs from the F4P Survey of Activities results for NGOs. Due to the lack of other information, other scaling factors were based upon expert judgement.¹²

Non-timber forest products

Information on the numbers of people employed as a result of NTFP activity is limited and focused on particular products. A very approximate estimate of around 500 people employed largely on a casual basis can be derived by aggregating figures from several recent studies. This estimate assumes that there is no double counting. Around 20 full-time, 6 seasonal, and 350 casual jobs can be attributed to the collection of wild mushrooms in Scotland (Dyke and Newton, 1999; CJC Consulting, 2005a). There are also around six seasonal and 20 casually employed wild seed collectors; 40 people employed full-time or part-time to provide wild-collected material for the production of wines and ales; and 7-8 full-time willow basket makers (Milliken and Bridgewater, 2001; Murray and Simcox, 2003; Paul and Chapman, 2007; Sanderson and Predergast, 2002). As these data relate to products which are gathered from non-woodland as well as woodland habitats, it is not possible to attribute all the jobs mentioned to Scottish forestry.

¹¹ All FC employees in Scotland are assumed to work at least part of the time on Scottish forestry. Thus, all are counted for the purposes of estimating numbers employed (in contrast to FTEs for which a proportion of employment related to Scottish forestry is assumed).

¹² The exact magnitudes of these factors remain uncertain. For example, if the correct factor to apply to forestry harvesting and planting excluding the FC itself (i.e. private non farm woodland, forestry companies and contractors, and FC contractors) were assumed to be 1.29 (from the F4P Survey of Activities results for the ratio of numbers employed to FTEs for FC contractors) rather than 1.1, this would increase the total numbers employed estimated to 13,169. However, it is thought that this ratio may be too high because it may have been inflated by contractors working in other forestry sub-sectors (Simon Gillam, *pers. com.*)

INDICATOR 2: NUMBER OF FULL-TIME EQUIVALENT JOBS IN FORESTRY

The number of full-time equivalent jobs (FTEs) is defined as total hours worked divided by the national average number of hours worked in full-time jobs. Thus, an FTE of 1.0 means that the hours worked are equivalent to those of a full-time worker, while an FTE 0.5 is equivalent to those of someone working half-time. The total employment in Scotland that is supported by the production and primary processing of Scottish timber by the Scottish forestry industry is estimated to be 13,190 FTEs. This is made up of 10,253 direct, 1,525 indirect, and 1,412 induced FTE jobs. The calculations used to derive these figures are given for each sector below.

Timber production

Production and primary processing of Scottish-grown timber by the Scottish timber industry and related employment is estimated to currently account for a total of around 10,250 FTE direct jobs.¹³ Approximate figures by type of employer are given in Figure 2 and Table 6.

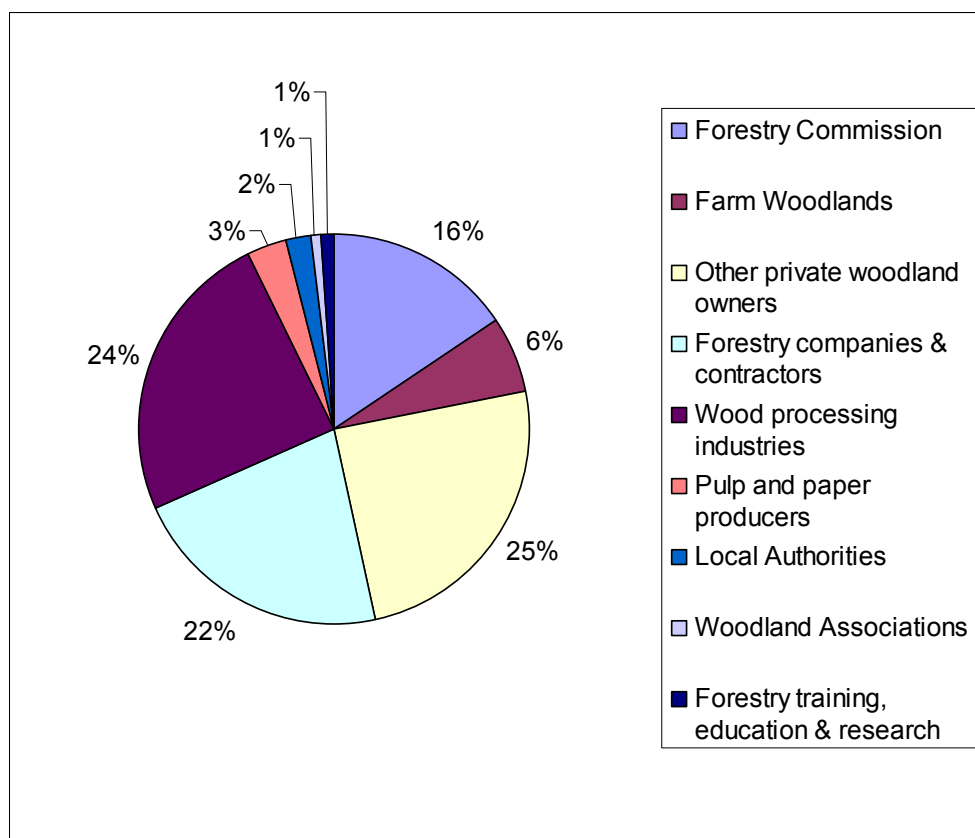


Figure 2. Forestry sector employment (FTEs) by employer type

¹³ This estimate is based upon a broad definition of the forestry sector similar to that used in the Forest Employment Survey 1998/99 (FC, 2001), encompassing forestry planting and harvesting, primary wood processing, and pulp and paper production, with paper and paperboard products excluded (IOC 33) on the basis that Scottish timber is not used.

Table 6. Direct employment in the Scottish forestry sector associated with Scottish timber

Employer type	Number of FTEs
Forestry Commission ¹⁴	1,593
Farm woodlands ¹⁵	646
Other private woodland owners ¹⁶	2,550
Forestry companies and contractors ¹⁷	2,223
Wood processing industries ¹⁸	2,494
Pulp and paper producers ¹⁹	350
Local authorities ²⁰	207
Woodland associations ²¹	85
Forestry training, education and research ²²	105
Total 10,253	

Source: Forest Research based upon FC and other data sources²³

Approximate figures²⁴ for the direct employment by sub-sector (Input-Output Classification) is given in Table 7.²⁵

¹⁴ This includes 1,205 FTEs employment within the FC itself (including Forest Research) and 340 FTEs contract employment for the FC in Scotland based on the estimated proportion (59.2%) of the total contract employment not associated with standing sales obtained from the results of the F4P Survey of Activities. (The total FC contract employment was 622, made up of 620 contracted by Forest Districts and 2 contracted by Conservancies.) For FC cost centres involving work that is GB-wide (including Corporate and Forestry Support and Forest Research), based upon the proportion of forest cover in the GB total, 48.8% of the employment was assumed to be associated with Scottish forestry (with the remainder assumed to relate to work on non-Scottish forestry).

¹⁵ This estimate is based on farm woodland employment per hectare in 1993/94 in England and Wales, extrapolated to Scotland, and then increased in proportion to change in farm woodland area (Sheila Ward, *pers. com.*).

¹⁶ This estimate is derived by subtracting the estimate for farm woodlands (646 FTEs) from the total for private woodland owners (3,196 FTEs) in the Forest Employment Survey 1998/99 (FC, 2001).

¹⁷ This estimate includes charcoal and coppice employment and is from the Forest Employment Survey 1998/99 (FC, 2001).

¹⁸ This is based upon subtracting the employment in pulp and paper manufacturing (350 FTEs) from the total for primary processing from the Forest Employment Survey (3,083 FTEs), and adjusting by subtracting processing employment by private woodland owners (166 FTEs) and adopting the most recent estimates for employment in sawmills and fencing (1,794 FTEs compared to 1,867 FTEs in the 1998/99 Forest Employment Survey data). The new figure for sawmills and fencing is based upon assuming 93% of total employment (1,929 FTEs) in these industries is associated with use of Scottish grown timber.

¹⁹ This estimate is based on employment at Caledonian Paper, the only paper mill in Scotland using Scottish timber and comes from the company website.

²⁰ This estimate is based on the Forestry for People Survey of Activities.

²¹ This estimate is based on the Forest Employment Survey 1998/99 data.

²² This estimate is based on the Forest Employment Survey 1998/99 data.

²³ Estimates draw upon the advice of FC statisticians.

²⁴ The precise breakdown is not known (Sheila Ward, *pers. com.*).

²⁵ Note that estimates for forest planting (2.1) and forest harvesting (2.2) are higher than those in the Annual Business Survey (ABI). For 2004, for example, the Input-Output Tables (based upon ABI employment data) give 1,997 FTEs in forest planting and 1,527 FTEs in forest harvesting, which are 61% and 62% of the corresponding F4P direct employment estimates. Although one reason for the discrepancies is that ABI data exclude very small businesses below the VAT threshold and single operators, it is likely that some of the 'additional' employment in the F4P estimates for these two sub-sectors is classified under different IOCs in the ABI data (Sheila Ward, *pers. com.*).

Table 7. Direct employment in Scottish forestry by sub-sector (IOC)

Activity	FTEs
Forest planting (2.1)	3,294
Forest harvesting (2.2)	2,447
Farm woodlands (1)	646
Haulage (94)	542
Wood processing (31)	2,577
Pulp and paper (32)	350
Local authorities (115)	207
Membership organisations (120)	85
Research and education (116)	105
Total 10,253	

Source: Forest Research based upon FC and other data sources²⁶

Primary wood processing accounts for around a quarter of total direct employment in the timber production chain (see Figure 3).

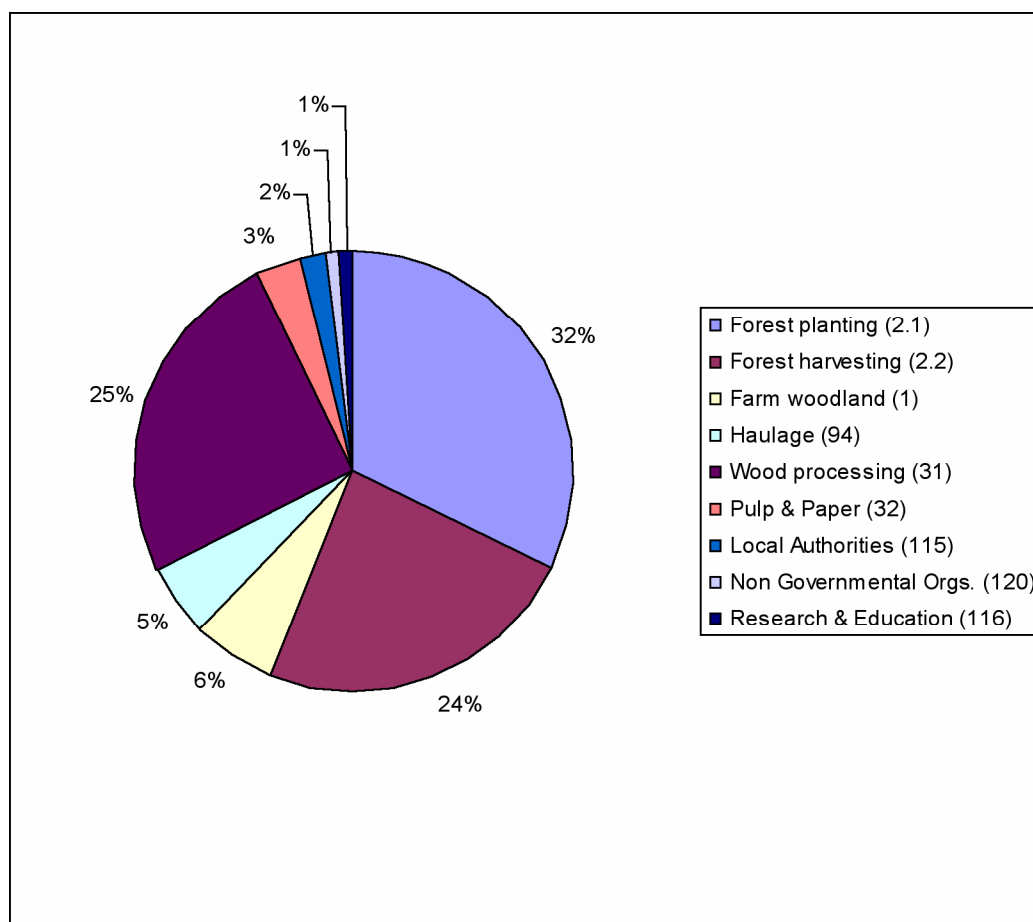


Figure 3. Forestry sector employment (FTEs) by sub-sector

²⁶ Estimates draw upon the advice of FC statisticians. FC employment is assumed to be in two main categories, forest planting (988 FTEs) and forest harvesting (793 FTEs), with a small number (46 FTEs) in haulage.

In addition, forestry generates employment outside the sector through purchases of supplies (indirect effects) and as a consequence of spending of wages and of forestry and supplier incomes (induced effects). Input-Output analysis using 2004 data suggests that these effects give rise to a further 2,900 FTEs in other sectors of the economy.²⁷ The Scottish timber industry and related industries is therefore estimated to support a total of around 13,190 direct, indirect and induced FTE jobs associated with use of Scottish-grown timber (see Table 8). However, this may under-estimate the indirect and induced effects, as direct employment in some sub-sectors is probably under-estimated,²⁸ the impacts of the smallest businesses are not taken into account,²⁹ and all impacts within sub-sectors (IOCs) that include forestry are excluded³⁰ even though some will be additional.³¹

Table 8. Employment supported by use of Scottish timber by the Scottish forestry industry

	FTEs
Direct	10,253
Indirect	1,525
Induced	1,412
Total 13,190	

Source: Scottish Government Input-Output analysis

There is little data on employment for different size of businesses. However some data is available on employment in sawmills and manufacture of round fencing, which represents over two thirds of the total employment associated with use of Scottish timber in wood processing industries in Scotland.³² About 54% of the total employment in Scottish sawmills and round fencing manufacturing is associated with medium size sawmills with a production of 10,000 m³ or more and 22% is associated with small sawmills with a production of 10,000 m³ or more (see Table 9). The remaining 24% is associated with micro and small sawmills having a production of less than 10,000 m³ and micro and small round fencing manufacturers.

²⁷ The F4P breakdown of direct employment by IOC (above) was used as the basis for the analysis. Demand-driven IO analysis was used to model the impacts of the total demand for the sectors' output. However, the results from the Input-Output analysis take no account of the higher estimated employment in forest planting (2.1) and forest harvesting (2.2) compared to the totals in the Input-Output data. The impacts both of small businesses below the VAT threshold and of the self-employed are not considered.

²⁸ Some of the estimated direct employment in forest planting and harvesting (IOCs 2.1 and 2.2) derived from the Forestry Employment Survey should probably be classified under other IOCs (Sheila Ward, *pers. com.*) so employment in the latter sub-sectors is likely to be under-estimated.

²⁹ Firms below the VAT threshold and the self-employed are not covered by the ABI employment survey data on which the Input-Output Tables are based. Data from the Labour Force Survey indicates that around half those working in forestry harvesting and planting (SIC 02) in the UK are self-employed (Simon Gillam, *pers. com.*).

³⁰ All indirect and induced effects in IOCs 1, 31, 32, 94, 115, 116 and 120 (in addition to those in IOCs 2.1, 2.2) were excluded to avoid any possibility of double-counting with the direct employment estimates.

³¹ For example, all indirect and induced impacts within the 'other road transport' category (IOC 94) are excluded although some of these will not be associated with timber haulage.

³² Of the total of 1,929 FTEs in sawmills and manufacture of round fencing combined (Sawmill Survey, 2006, 2004 and 1998; Fencing Survey, 1997), an estimated 1,794 FTEs (93%) is associated with use of Scottish timber. This is 72% (1,794 / 2,494) of the total FTEs in the wood processing sector associated with use of Scottish timber (see Table 7).

Table 9. Total employment in sawmills and round fencing manufacture in 2006, by type of business³³

Type of business	Employment size category	FTEs
Sawmills with total production of 10,000 m ³ or more	Micro 0-9	0
	Small 10-49	424
	Medium 50-249	1,038
	Large 250+	0
Sawmills with total production of 5,000 m ³ to 10,000 m ³	Micro 0-9	0
	Small 10-49	197
	Medium 50-249	0
	Large 250+	0
Sawmills with total production of less than 5,000 m ³	Micro 0-9	129
	Small 10-49	65
Round fencing manufacturers	Micro 0-9	61
	Small 10-49	15
Total³⁴		1,929

Source: FC (2007e)³⁵

Direct employment in Scottish forestry decreased during the 1990s, mainly because of productivity improvements in harvesting (FC, 2002). The employment potential of the forestry sector varies regionally depending on the economic structure and the relative importance of different woodland types (Roberts *et al.*, 1999).

Employment supported by forestry contributes to sustaining rural economies. Although the total employment in forestry and wood processing is relatively small, it can be of great importance in some localities (FC, 2002). The spatial tracking of employment flows from the Scottish timber industry presented in the Scottish forestry Input-Output report (Roberts *et al.*, 1999) showed that farm woodlands are more closely integrated within local areas than other woodland types, such as existing native woodlands, new native woodlands and commercial conifer plantations. In 1995, over 50% of farm woodland timber was processed within 50 km of the woodland compared to an average of 25% for all types of woodlands in Scotland.

Non-timber forest products

The information on levels of employment within the NTFP sub-sector is very approximate and incomplete. In addition to the data on numbers employed summarised for Indicator 1, a very approximate estimate of 125 FTEs associated with the wild moss harvest in Scotland has been provided by Staddon (2006).³⁶

³³ Figures from the 2004, 1998 and 1997 surveys (for sawmills with a total production of 5,000 m³ to 10,000 m³, sawmills with total production of less than 5,000 m³, and round fencing manufacturers, respectively) have been up-rated to 2006 levels using the changes in roundwood consumption levels in each size category. Although covering only a small proportion of the total direct FTEs in the sector, it is the most detailed and up-to-date breakdown of FTEs by business size available at time of writing. The estimates include use of a small proportion of non-Scottish timber (assumed to amount to 7%).

³⁴ Note this is an approximation that draws upon data from surveys carried out in different years.

³⁵ Table 9 was based on further analysis in 2007 by FC Economics and Statistics of data from the Sawmill Survey 1998, 2004 and 2006, and Fencing Survey 1997.

³⁶ The estimate should be treated with caution since it is based upon a very small sample, and is also partly attributable to harvesting in raised peat bogs rather than in woodland.

While levels of employment in the NTFP sector are relatively low, a sizeable proportion of the Scottish population have collected NTFPs while visiting forests. The F4P Omnibus Survey 2006 estimated that 13% of the Scottish adult population (or 23% of those who had visited woodlands in the previous 12 months) had gathered NTFPs from woodlands in Scotland on one or more of their woodland visits.³⁷ 12% of collectors (i.e. 2% of the Scottish adult population) stated that NTFP gathering was important or very important to their livelihood or ability to make ends meet. These people were more likely to be younger (in the 16-34 age class) and in the DE socio-economic group than the 80% of gatherers (10% of Scottish people) who felt collecting NTFPs was unimportant or very unimportant to their livelihood or ability to make ends meet. Of all those gathering, only 2% collected as part of formal employment and nobody in the sample sold or bartered products on an individual basis. 86% of people who gathered (i.e. 11% of the Scottish adult population) did so for personal use and enjoyment (see also Emery *et al.*, 2006).

From the F4P Omnibus Survey 2006 it is also possible to estimate the total time spent by the Scottish adult population collecting NTFPs in woodlands, using data on frequency of collection and the average time spent collecting, and this figure can be converted into FTEs (where FTE for a full-time person is 37.7 hours per week). At the Scottish population level, people spent the equivalent of 3,395 FTEs gathering from woodlands. Due to the small sample size there is a wide confidence interval attached to this figure of +/-72%. However, the use of FTEs as a measure of NTFP collection can be misleading since they are collected primarily for non-livelihood purposes.

Game

The Scottish game sector generates direct employment through providers of sport shooting opportunities that employ staff to manage the land (beaters, loaders, shoot managers, game keepers). Some shooting providers will also employ ancillary staff to manage all aspects of the business, including catering and accommodation. Further employment is generated as a result of habitat and wildlife management associated with sport shooting. Management activities range from the creation and maintenance of woodlands, hedgerows and banks to controlling pests.

In addition to direct employment, the Scottish game sector generates employment through the businesses (e.g. game farms) that supply the sector (indirect employment) and as a consequence of spending of wages and incomes earned either directly or indirectly from the sector (induced employment). In 2004, the Scottish game sector³⁸ supported a total of 11,000 FTE jobs including 5,300 direct FTE and 5,700 indirect and induced FTE jobs (PACEC, 2006). Habitat and wildlife management activities associated with sport shooting in Scotland generated a further 2,000 FTEs (PACEC, 2006).

The number of FTE jobs generated by the Scottish game sector that are associated with woodlands is unknown. However, a rough estimation can be made using the area of woodlands as a proportion of the total area managed for sport shooting purposes in the UK assuming this proportion is the same in Scotland as for the UK as a whole. Assuming that the average Scottish game sector employment per hectare associated with woodland is the same as the mean for other land types, and that 40% of the area managed for sport shooting

³⁷ The Public Opinion of Forestry Surveys 2005 in Scotland, England and Wales (FC, 2005b, 2005c and 2005d) found that 27%, 27% and 31% respectively of people who had visited a woodland in the previous few years had gathered fungi and plant materials, indicating that levels of gathering are similar for each country.

³⁸ Covering live quarry sport shooting, including deer, rabbits, foxes, pigeons, wildfowl and gamebirds (for definitions see: PACEC, 2006, p.6), but not angling or falconry.

in Scotland is woodland,³⁹ it is estimated that around 4,400 direct and indirect/induced FTEs are associated with woodlands in the Scottish game sector.⁴⁰

On this basis, a total of around 5,200 FTEs are estimated to be associated with woodlands in the Scottish game sector and related activities, including 800 FTEs in woodland management (see Table 10).⁴¹ It is unclear to what extent employment in woodland management may be covered in previous estimates for direct employment by private woodland owners. Therefore only around 4,400 FTEs can definitely be considered additional to the estimate of 13,190 FTEs supported by the use of Scottish timber by the Scottish forestry industry, but there may be some overlap with the FTE estimates for visitor spending.

Table 10. Estimated game sector employment associated with Scottish woodlands

	FTEs
Direct	2,128
Indirect / Induced	2,288
Total game sector	4,416
Woodland management	800
TOTAL	5,216

Shooting opportunities in Scotland are mainly provided as part of an estate (private or public) (PACEC, 2006). The role of FCS and its contribution to the game sector within the Scottish economy is not clearly stated.⁴² No data of game sector employment associated with woodland by type of organisation is available. However, very approximate estimates can be derived by multiplying the proportion of the employment they provide in the Scottish game sector as a whole by the estimated 2,928 FTEs associated with woodland (i.e. direct employment including woodland management). See Table 11.

³⁹ At the UK level, there are 830,000 ha of woodlands out of 2,067,000 ha of land managed for sport shooting (i.e. 40%). In Scotland, a total of 700,000 ha are managed for sport shooting purposes (PACEC, 2006). Assuming 40% of this area is woodland implies that there are about 280,000 ha of woodlands (700,000 *0.4) managed for sport shooting in Scotland. As there are currently estimated to be 1.3 million ha of woodland in Scotland (FC, 2007c), this represents a relatively modest proportion (21%) of the total. However, the assumption that 40% of the area managed for sport shooting is woodland could be an over-estimate. For example, in a report on countryside recreation and sports activities and farm diversification in the Borders, the percentage of woodland in the total mapped survey area of habitats was only 4% (SWRC and SAC, 2002: 43). However, this figure was for a sample of farms (including angling habitats) and did not cover the FC land or other non-farm woodland. It therefore appears to offer a less reliable guide to estimating Scottish game sector employment associated with woodland.

⁴⁰ Estimated as: direct FTEs = 5300*0.4, indirect/induced FTEs = 5700*0.4.

⁴¹ Woodland management FTEs estimated as 0.4*2000.

⁴² PACEC surveyed shooting lease holders on FCS land however the results presented do not distinguish data related to FCS.

Table 11. Estimated game sector employment associated with Scottish woodlands by type of organisation providing sport shooting

Type of organisation providing sport shooting in Scotland	%	FTEs
Part of estate	87	2,547
Part of tenant farm	5	146
Shooting tenant	13	381
Club	2	59
Syndicates	13	381

Source: Percentages for whole Scottish game sector from PACEC (2006)⁴³

INDICATOR 3: NUMBER OF FULL-TIME EQUIVALENT JOBS DUE TO FOREST-RELATED AND FOREST-ASSOCIATED VISITOR SPENDING

Forest-related spending is defined here as expenditure directly related to recreation at forest sites, including on-site facilities such as visitor centres (Hill *et al.*, 2003). Using the Scottish Recreation Survey expenditure data on average expenditure on trips for outdoor recreation (TNS, 2006b),⁴⁴ the total first-round (direct) impacts of spending from forest-related tourism and recreation is estimated to be 17,900 FTE jobs. Of this total, 13,400 FTEs are due to tourism, which is defined here as trips that are non-regular (less than weekly) and more than three hours in duration where woodland is the main destination. Forest-related spending due to recreation, i.e. trips that occur more frequently and are of a shorter duration,⁴⁵ supports about 3,700 FTEs. In both cases, the method used in CJC Consulting (2006, Table 3.9, p.22) is adopted, but using the above (different) classification of tourism and recreation trips, with estimates based upon expenditures on trips to woodland and an employment effect of £31,580 per FTE supported (at 2007/08 prices).

A further 750 FTEs are estimated to be associated with forest-related tourism spending by other UK residents, defined as trips by other UK residents where woodland was the only or a very important reason for visiting Scotland. The employment impacts may be underestimated, because the basis for the estimates for Scottish residents are the 34.2 million visits (16% of trips) where woodlands were the main destination, and no estimates of impacts of spending for other woodland trips were available.⁴⁶ Also employment generated by spending by visitors from outside the UK is excluded.⁴⁷ This estimate is based upon visit number and expenditure information from the All Forests Surveys for years 1-3.⁴⁸

⁴³ The sum is higher than total direct and woodland management FTEs (2,928) as some providers are classified in more than one category. Similarly, percentages do not sum to 100%.

⁴⁴ This provides estimates for visitor expenditure and number of visits to the countryside where woodland was the primary purpose of the visit, neither of which is provided by the F4P Omnibus Surveys or Public Opinion of Forestry Surveys.

⁴⁵ Defined for Scottish residents as all other trips where woodland is the main destination.

⁴⁶ The exception is the case of employment impacts due to spending by non-Scottish residents, where, following CJC Consulting (2006), impacts of expenditure from multiple destination trips where visiting woodland was a 'very important' reason for the trip are included.

⁴⁷ This figure was excluded because it is uncertain to what extent the existence of Scottish woodland influences decisions of visitors from outside UK to come to Scotland, as opposed to their decisions regarding where to visit once they arrive. A similar point applies to Indicator 7.

⁴⁸ This is the only survey that covers expenditure and visit numbers by other UK residents (TNS, 2006c, 2006d, 2008a and 2008b).

In contrast to forest-related spending, forest-associated spending is conceptualised as expenditure arising from the proportion of total visitor spending incurred as a consequence of forests influencing trip destination (Hill *et al.*, 2003). While no information is published on forest-associated spending, a very rough estimate suggests that the corresponding employment could be significant. Applying a similar methodology to that used for forest-related visitor spending, a very approximate estimate of forest-associated visitor spending⁴⁹ would yield a figure of around 7,500 FTE jobs. This figure is additional to the estimate for forest-related spending. It is estimated as £238 million (see Indicator 7 for derivation) divided by £31,580 per FTE (all at 2007/08 prices), where the former represents 12% of the total expenditure during visits to the countryside (excluding those where woodland was the main destination).

INDICATOR 4: NUMBER OF VOLUNTEERS AND VOLUNTEER DAYS ASSOCIATED WITH FORESTS

Data from the F4P Survey of Activities 2007 provides new estimates for the number of volunteers engaged in forest-related work, and number of volunteer days in the 12 months prior to mid-2007 when the Survey was carried out. The total number of organisations contacted was 486 and the response rate was around 30% (see Table 4). The figures were multiplied up using conservative assumptions to cover the known population size for each sector, as described in Section 1. The results are given in Table 12. From these data, the number of volunteers associated with woodland in Scotland is estimated to be 7,500, while the number of volunteer days between mid-2006 and mid-2007 is estimated to be 47,400 days. The data suggest that the NGO sector accounted for the greatest proportion of volunteers and volunteer days, followed by the community woodland sector.

Table 12. Number of volunteers and volunteer days spent on forest-related work in Scotland, from August 2006 to August 2007, according to type of organisation

Type of organisation	Number of volunteers	Volunteer days
Forestry Commission	1,312	3,334
Community woodland groups	2,295	11,927
Non-governmental organisations	2,631	22,440
Local authorities	472	4,881
Public bodies	425	64
Forestry companies	-	145
Private woodland owners	398	4,653
Total	7,532	47,444

Source: F4P Survey of Activities (2007)

Many other studies on volunteering exist but, prior to this project, none had focused specifically on forestry. According to results from the 2006 Scottish Household Survey, 25% of adults took part in formal voluntary activities through a club, organisation or group in the previous 12 months (Volunteer Development Scotland, 2006a). Remote, small and accessible rural areas in Scotland had higher volunteering rates than large urban areas.

⁴⁹ The section on GVA provides details of how the very approximate expenditure estimate for forest-associated tourism is derived.

In terms of the environment, a recent study carried out by Volunteer Development Scotland (VDS) on behalf of Scottish Natural Heritage presents a review of volunteering in the natural heritage sector (Volunteer Development Scotland, 2006b). The aim was to quantify the scope of natural heritage volunteering in Scotland and examine ways of supporting and developing it. A database of 553 organisations involved in volunteer work in natural heritage in Scotland was developed. A survey of 204 of these organisations was undertaken to analyse their work with volunteers.⁵⁰ Out of the 204 organisations it was calculated that a total of 23,340 volunteers volunteered for a total of at least 91,149 hours in an average month. The estimated economic value of this time was £14.25 million per annum. This value was calculated by converting the number of volunteer hours worked into full-time equivalent weeks and then multiplying this by the average weekly wage for Scotland (£379.90, excluding overtime). An extra 20% was added to cover 'employment overheads' such as national insurance, holiday pay and other benefits (Volunteer Development Scotland, 2006b).⁵¹ In the study, volunteer activity was subdivided into four main groups:

Organisational support: including fund raising, being on a management committee or steering group, coordinating other volunteers accounted for 34% of volunteer activity.

Education/training/awareness: including community and family activities, preparing information, working with schools or leading walk accounted for 30%.

Practical work: including managing or improving habitats, improving access, construction or gardening for wildlife accounted for 24%.

Biological recording: including surveying sites and habitats, counting wildlife and managing data accounted for 12% of volunteer activity.

The Volunteer Development Scotland (2006b) report focuses on natural heritage as a whole and does not consider volunteering in forestry separately. The figure derived by the F4P Survey of Activities equates to around 215 FTEs (assuming an eight-hour day), which is around 35% of the VDS figure for total time spent on natural heritage volunteering in Scotland.

An additional method was used in the project to derive estimates for the level of forest-related volunteering in Scotland. In the F4P Omnibus Survey 2006 respondents were asked whether they have been involved in a range of formal voluntary activities in the previous 12 months. 2% had been involved or consulted about plans for creating, managing or using woods in their area; 2% had been involved in an organised tree planting event; 1% had been involved in voluntary work such as physical work in a wood, administration, fund raising or running a group. This latter figure of 1% appears to be close in scope to the estimate for number of volunteers derived from the F4P Survey of Activities of 7,532, which equates to a figure of 0.2% of the population. Errors associated with the small sample of recipients to the F4P Omnibus Survey who reported volunteering activity are a likely cause for the discrepancy.

⁵⁰ A sample of organisations was selected from the database using a sampling matrix based on annual income (small: up to £50,000 per annum, medium: £50,001 to £500,000 per annum, and large: over £500,000 per annum).

⁵¹ This approach to valuation of volunteering has not been used for the F4P Survey of Activities estimates because it focuses attention on the cost savings to agencies who recruit volunteers rather than on those primarily non-financial benefits to individuals and communities which motivate people to become volunteers.

INDICATOR 5: PERCENTAGE OF TIME SPENT WORKING AND VOLUNTEERING ON DIFFERENT FORESTRY-RELATED ACTIVITIES

The F4P Survey of Activities included questions to estimate the proportion of time spent by directly employed staff, contract staff and volunteers on ten different forestry-related activities (see Table 2). A sample questionnaire is given in Annex 3, which includes definitions of each activity. The results are given in Tables 13-15, expressed as weighted averages for each forestry sub-sector. Note that the private woodland owners sampled for the survey were selected from those who had recently received FCS grants for 'recreation' and/or 'community involvement'. It was assumed that private woodland owners who had not received grants for these activities would not be carrying out significant levels of the social forestry activity relevant to the project. Given this non-random sample, the average times spent on different activities quoted below are not representative of all private woodland owners. Also, note that only four public bodies responded to the survey and the results for this sector have wide confidence intervals.

Table 13 indicates that in all sectors except private woodland owners the greatest proportion of time was spent on 'organisational support', followed by 'woodland management'. The sector that spent the greatest proportion of time on social forestry activities was public bodies, followed by NGOs and then by community woodland groups. The sample of private woodland owners, all of whom have received grants for 'recreation' and/or 'community involvement', spent the lowest proportion of time on social forestry activities.

Table 13. Proportion of time spent by directly employed staff on different forestry activities by sector

Type of Organisation	Proportion of time spent on each activity (%)											Total
	Economic, environment and administration				Social forestry							
	Organisational support	Woodland management	Harvesting and processing	Biodiversity and wildlife	Recreation and access	Formal education	Informal learning	Health and well-being	Cultural activities	1Public involvement	Time spent on social forestry	
Community Woodland Groups	21.4	17.3	6.7	13.9	11.3	5.3	4.2	5.3	4.2	10.4	40.7	100
Forestry Commission	25.3	18.5	12.8	9.0	12.2	3.8	4.2	2.8	3.8	7.7	34.3	100
Local Authorities	23.6	26.9	4.6	8.4	12.5	5.6	4.0	1.4	2.5	10.5	36.6	100
NGOs	27.8	14.3	4.4	9.4	18.1	8.1	7.0	3.3	2.2	5.3	44.0	100
Private Woodland Owners	7.4	31.9	22.6	8.7	17.4	0.0	3.1	3.7	1.1	4.3	29.6	100
Public Bodies	33.3	2.5	2.5	7.5	25.0	5.0	2.5	5.0	11.0	5.8	54.3	100

Source: F4P Survey of Activities (2007)

For the social forestry activities, most time was spent on 'recreation and access', especially by public bodies, followed by NGOs and the private woodland owners. Public bodies spent

the highest proportion of time on cultural activities. NGOs spent proportionally more time on 'formal education' and 'informal learning' than all other sectors. Staff employed by community woodland groups spent more time than most other sectors on 'public involvement' and 'health and well-being'. Across all sectors, an unweighted average of about 40% of direct employees' time was spent on social forestry activities.

Forestry companies and contractors have not been included in these tables. As covered in Section 1, the top ten companies were asked to provide information on numbers of employees and volunteers, but they were not asked to provide proportions of time spent on each activity. However, for all other sectors, the questionnaire asked respondents to record information for forestry contractors that they had employed in the previous 12 months. Table 14 indicates that the unweighted average time spent on social forestry activities by all contractors employed for all sectors was 26%, which is lower than the time spent by direct employees in any one sector. This figure may be indicative of private forestry companies as a whole.

Table 14. Proportion of time spent by contractors on different forestry activities by sector

Type of Organisation	Proportion of time spent on each activity (%)											
	Economic, environment and administration				Social forestry							Total
	Organisational support	Woodland management	Harvesting and processing	Biodiversity and wildlife	Recreation and access	Formal education	Informal learning	Health and well-being	Cultural activities	Public involvement	Total spent on social forestry	
Community Woodland Groups	19.6	42.2	1.1	9.4	13.3	6.3	2.6	0.0	2.9	2.5	27.6	100
Forestry Commission	0.4	29.7	47.5	7.3	12.0	0.4	0.5	0.1	1.5	0.7	15.2	100
Local Authorities	19.7	32.2	14.7	4.9	18.0	1.4	0.7	2.1	0.7	5.7	28.6	100
NGOs	7.3	39.0	9.5	4.2	10.9	1.4	14.0	7.9	0.8	5.0	40.0	100
Private Woodland Owners	11.5	32.6	22.9	16.8	13.2	0.7	0.0	0.0	0.0	2.3	16.2	100
Public Bodies	-	-	-	-	-	-	-	-	-	-	-	-

Source: F4P Survey of Activities (2007)

Data from the F4P Survey of Activities was also used to estimate that volunteers carrying out forest-related work spend about 50% of their time on social forestry activities (see Table 15). This compares with 40% for direct employees (using unweighted averages) as discussed above. As with direct employment, most time was spent by volunteers across all sectors on 'organisational support', followed by 'woodland management'. Of the activities identified as 'social forestry there is wide variation in the percentage of time spent on certain activities by certain sectors. Volunteers working for private woodland owners score very highly for 'recreation and access', followed by FC and very low for other social forestry activities. Note that owners may consider their own forest-related work to be voluntary. Volunteers for NGOs

spend much more time on 'health and well-being' than other sectors. Local authorities considered their volunteer activity to be classed primarily as 'public involvement' while NGOs, for example, scored very low for this activity. On average, a much lower proportion of time appears to have been spent on organisational support than the figure of 34% that was derived by the SNH-sponsored study for natural heritage volunteering (Volunteer Development Scotland, 2006b). This may simply be due to the larger number of categories that were used in the F4P Survey, making comparisons between the two studies difficult.

Table 15. Proportion of time spent by volunteers on different forestry activities by sector

Type of Organisation	Proportion of time spent on each activity (%)											
	Economic, environment and administration				Social forestry							Total
	Organisational support	Woodland management	Harvesting and processing	Biodiversity and wildlife	Recreation and access	Formal education	Informal learning	Health and well-being	Cultural activities	Public involvement	Total spent on social forestry	
Community Woodland Groups	30.5	17.5	2.7	11.2	13.4	1.5	5.8	2.9	3.9	10.7	38.2	100
Forestry Commission	4.3	22.5	0.0	20.4	20.4	9.8	4.7	5.3	2.7	9.9	52.8	100
Local Authorities	9.9	23.1	5.0	15.4	12.8	0.6	8.0	5.1	2.8	17.3	46.6	100
NGOs	3.3	21.8	0.2	12.8	16.4	0.8	7.4	28.6	5.0	3.7	61.9	100
Private Woodland Owners	9.4	9.6	8.8	13.0	45.3	1.9	1.8	3.1	3.5	3.5	59.1	100
Public Bodies	0.0	0.0	0.0	60.0	20.0	0.0	0.0	10.0	10.0	0.0	40.0	100

Source: F4P Survey of Activities (2007)

INDICATOR 6: PERCENTAGE OF FORESTRY EMPLOYEES WHO ARE SATISFIED WITH THEIR JOB

A literature review was carried out on indicators of job quality, which identified job satisfaction, accidents at work, average distance travelled to work and average salary as potential indicators for use by the project. It was decided to use job satisfaction as an indicator to measure job quality because it does not require explicit assumptions to be made regarding the definition of 'quality'. Levels of job satisfaction, as expressed directly by employees, may give a more accurate indication of quality than the use of proxy measures such as levels of pay, numbers of accidents at work, or distance travelled to work.

Two existing studies report data on job satisfaction in forestry: the FC Employee Opinion Survey (ORCI, 2005) and the Quality of Natural Heritage Jobs report (Rsk Era Ltd., 2001). A number of other reports including 'A Survey of People in the Forest Industries in South Scotland' (Lee *et al.*, 2007) and the Forest Industries Recruitment and Retention Strategy Progress Report (Wise and Ridley-Ellis, 2006) also provide relevant information.

Using data from the FC Employee Opinion Survey (2005), 70% of respondents who worked for FCS stated that they gained personal satisfaction from their job, and 58% stated that they would recommend the FC to others as a good place to work (see Figure 4).

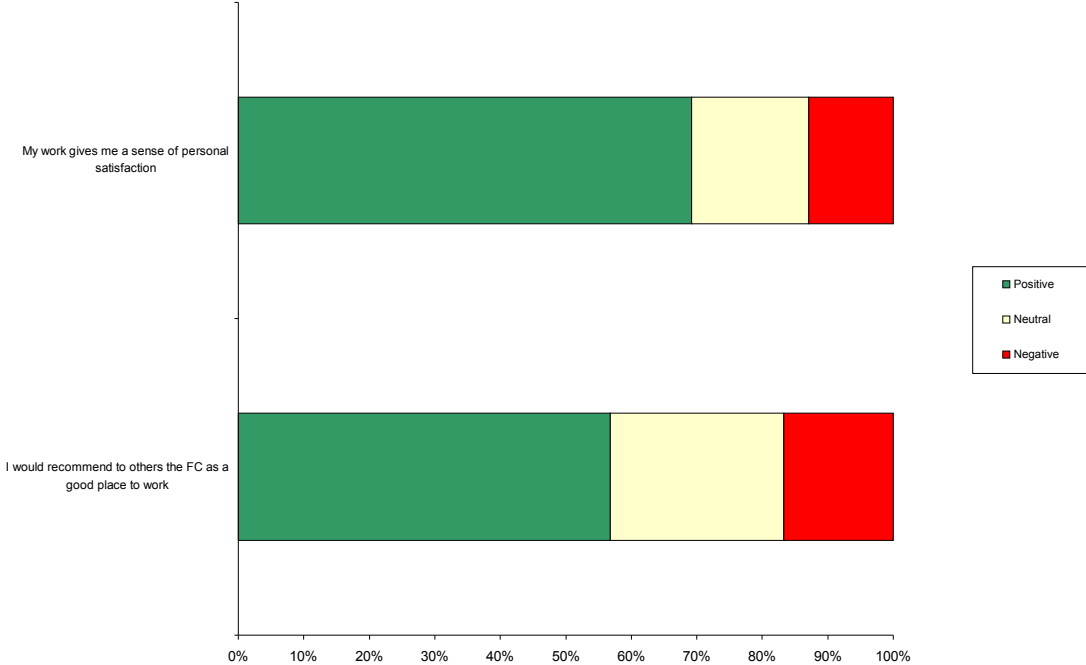


Figure 4. Responses of FCS employees to Employee Opinion Survey questions relating to job satisfaction (Source: ORCI, 2005)

The Rsk Era Ltd. (2001) report documents research on the quality of natural heritage jobs in rural areas in Scotland. It points out that little published information exists on perceptions of job quality in the natural heritage sector and in particular there is a lack of information on qualitative aspects such as how people feel about their jobs and the importance of psychological dimensions such as relationships with others and work/life balance. The report contains a short section on enviro-forestry⁵² which states that interviews conducted as part of the research suggest that those employed in voluntary sector forestry jobs (like employees in the broader natural heritage voluntary sector) have higher job satisfaction than their public sector counterparts. This is despite the fact that they have poorer contractual job conditions and promotion prospects. Public sector enviro-forestry respondents differed from other members of the natural heritage workforce in their reporting of job quality. They were found to be more career-driven and felt more overworked, but had better satisfaction with pay.

A report by Lee *et al.* (2007) on a survey of ‘People in the Forest Industries in South Scotland’ asked about the best and the worst things about working in forestry in order to identify determinants of job satisfactions and dissatisfactions. Across the broad range of job types present in the sector the top three satisfactions were ‘being in the outdoors’, ‘variety of work’ and ‘freedom/being my own boss’. The top three factors identified as being the ‘worst

⁵² Enviro-forestry employees are defined as those that work in forest design, planting and management work that involves elements of environmental protection and conservation. Examples include planters and maintainers of amenity, riparian and community woodland, and foresters, rangers and contractors carrying out habitat related work.

thing about the job' were 'paper work/red tape', 'bad management/other people doing a bad job' and 'insufficient pay'. Key differences between job types within the forestry sector were that administrative and clerical staff rated 'variety of work' and 'work being appreciated' as more important positive factors than others, while managers and craftsmen were more concerned with 'benefiting the environment'. 'Insufficient pay' was a particular concern of machine operators and craftsmen while 'lack of opportunities' was more likely to be cited as a poor aspect of employment by administrative and clerical staff.

The Forest Industries Recruitment and Retention Strategy report (Wise and Ridley-Ellis, 2006) highlights that, for many, forestry is a 'vocation' resulting in high occupational commitment regardless of the negative factors of employment in the sector. Lee *et al.* (2007) also comment that 50% of respondents indicated that forestry is their preferred industry, 27% describe it as 'their life' and only 15% felt it was 'just a job'. Wise and Ridley-Ellis (2006: 1) note however that "one fifth of a sample of Scotland's forest industry organisations felt that the recruitment and retention of staff was a significant obstacle to the success of their business (a much higher proportion if micro-businesses are excluded)".

2.2 CONTRIBUTION TO THE ECONOMY

KEY FINDINGS

The total Gross Value Added (GVA) (direct, indirect and induced) associated with Scottish timber is estimated to be around £460 million at 2007/08 prices, or 0.5% of the total GVA for the Scottish economy. This total is made up of £304 million for direct GVA, £86 million for indirect GVA and £69 million for induced GVA. These estimates are based upon the broad definition of the forestry sector outlined above, excluding GVA associated with the use of timber not grown in Scotland.

In addition, the GVA of first-round (direct) visitor spending attributable to woodland visits, where woodland was the primary reason for the visit, is estimated to be £209 million at 2007/08 prices.

In mid-2006, an estimated 74% of the Scottish adult population agreed or strongly agreed that 'woodlands are important in helping people to earn a living or make ends meet'.

GVA and employment associated with non-timber forest product harvesting and the game sector in Scotland are difficult to assess, although both sub-sectors appear to provide small but significant contributions to the economy.

BACKGROUND

The Scottish Government sees economic development as the primary means of raising the quality of life of the Scottish people through increasing opportunities for all on a socially and environmentally sustainable basis. This is the objective of the Government's Economic Strategy, which aims to raise Scotland's GDP growth rate to the UK level by 2011 by working towards five strategic priorities that are internationally recognised to contribute to economic growth: learning, skills and well-being; supportive business environment; infrastructure development and place; effective government; and equity (Scottish Government, 2007c).

The contribution of the forestry sector to this goal is assessed in this report through estimates of Gross Value Added (GVA) which measure the contribution to the Scottish economy of each individual producer, industry or sector. GVA is defined as the difference between the value of goods and services produced and the cost of raw materials and other non-labour inputs which are used up in production (Office of National Statistics, Annual Business Inquiry definition).⁵³ Therefore it represents employment costs, plus gross operating surplus, plus taxes, less any subsidies on production.

As with the employment indicators discussed above, the forestry sector is defined broadly to include forestry harvesting and planting, farm woodlands, haulage, primary wood processing, pulp and paper, and public sector, non-governmental organisation, and research and education employment that is associated with Scottish forests. However the estimates

⁵³ GVA is the difference between output and intermediate consumption for any given sector/industry See: www.statistics.gov.uk/abi/variable_info.asp/
www.statistics.gov.uk/about/glossary/economic_terms.asp.

exclude employment associated with the use of timber not grown in Scotland. Estimates of the GVA of spending by visitors to forests are given under Indicator 7 followed by GVA of forest products and services. Very approximate assessments for the contribution to the economy of non-timber forest product harvesting, and the game sector in Scotland are also provided. Finally, data is presented on public perceptions of the contribution of forestry to livelihoods in Scotland.

INDICATOR 7: GROSS VALUE ADDED OF FOREST-RELATED AND FOREST-ASSOCIATED SPENDING BY VISITORS

Forest-related spending is expenditure directly related to recreation or tourism at forest sites, including associated site characteristics, such as visitor centres (Hill *et al.*, 2003). For residents of Scotland, only trips where woodland was the main destination were counted in this study as forest-related, with tourism defined as covering trips that are non-regular (less than weekly) and more than 3 hours in duration, and recreation defined as all other trips. Trips by other UK residents were classified as tourism and as forest-related where visiting woodland was the only or 'very important' reason for the trip.

In order to estimate the GVA due to forest-related spending, it is necessary to obtain an estimate of what proportion of the spending GVA accounts for. Assuming that GVA represents an average of 37% of spending,⁵⁴ we estimate a GVA of £157 million from first-round (direct) forest-related spending due to tourism and £43 million from forest-related spending due to recreation by Scottish residents at 2007/08 prices (see Table 16). These estimates are based upon Scottish Recreation Survey data for average expenditure for trips where woodland was the main destination.⁵⁵

Similarly, a GVA of £9 million at 2007/08 prices is estimated for forest-related tourism spending by other UK residents.⁵⁶ This is based upon All Forest Survey data for average expenditure for trips where woodland was the only or 'very important' reason for the trip.⁵⁷

First-round (i.e. direct) spending from forest-related tourism and recreation combined is estimated to give rise to a total GVA of around £210 million at 2007/08 prices. This probably under-estimates the total, as the basis for the estimates for Scottish residents are the 34.2 million visits where woodlands were the main destination with GVA due to spending for other

⁵⁴ This is a weighted average of two estimates. We assume (based upon the GB Day Visitor Survey) that about 20% of total expenditure is for fuel for which GVA share is very low (Simon Gillam, *pers. com.*), perhaps of the order of 5% (although the share of fuel in total expenditure may vary with type of visit). For the rest of the expenditure, the share of GVA is assumed to be 45% (following CJC Consulting, 2006: 22).

⁵⁵ The estimates were based upon mean expenditure of £5.80 per recreation visit and £26.89 per tourism visit in 2007/08 prices. 60% of visits (19.2 million of the 34.2 million total) were classified as recreation, and 40% as tourism (15 million of the 34.2 million total). The estimates cover expenditure during the visit, excluding accommodation and related expenditure. The SRS questionnaire has no category for accommodation expenditure (Neil Grant, *pers. com.*) and cannot separately identify visits associated with overnight stays.

⁵⁶ An estimated 0.9 million visits per year were made to FCS forests by visitors resident outside Scotland during the period 2004-2007 (based upon the combined visit numbers from the three years of the All Forest Survey). Of the 760,000 of these visits that were made by residents of other parts of the UK, 430,000 were trips where visiting woodland was the only or 'very important' reason for the trip. The estimate includes expenditure on accommodation, with the All Forests Survey questionnaire asking for expected expenditure on day of visit or night before if appropriate (Neil Grant, *pers. com.*).

⁵⁷ Visits by residents of other parts of the UK where visiting woodland was the only or 'very important' reason for the trip were associated with average spending per trip of £58.99 in 2007/08 prices, a total expenditure of £25 million, and GVA (assuming this accounts for 37%) of £9 million.

woodland trips excluded.⁵⁸ Spending by other UK residents to non-FC woodlands and by overseas visitors to Scottish woodlands is also not covered by the estimates.⁵⁹ To some extent these effects may offset each other.

Table 16. Gross Value Added of forest-related visitor spending

	GVA at constant (2007/08) prices (£m) ⁶⁰
Recreation (Scottish residents)	43
Tourism (Scottish residents)	157
Total (Scottish residents)	200
Tourism (other UK residents)	9
Total (all UK residents)	209

Sources: Scottish Recreation Survey 2004/05, All Forest Survey 2004-07, and Forest Research

Forest-associated spending is conceptualised as expenditure arising from the proportion of total visitor spending incurred as a consequence of forests influencing trip destination (Hill *et al.*, 2003). Table 17 gives estimates from Hill *et al.* (2003) of the average percentage of total tourist expenditure attributable to forests, based upon forests and forest facilities being ranked among other area characteristics by visitors surveyed at major tourist sites⁶¹ in the summer of 2002.

Table 17. Mean total tourist expenditure attributable to forests (%)

	The Trossachs	The Borders	Mean
Day visitors	11	13	12
Overnight visitors (staying in the area)	14	10	12
Overnight visitors (staying outside the area)	13	11	12
All visitors	13	11	12

Source: Hill *et al.* (2003, Table 6.16, p.114)

Although Hill *et al.* (2003) provide no estimates of GVA for forest-associated spending,⁶² an approximate calculation suggests that it could be significant. If the mean total tourist expenditure attributable to forests of 12% for the Trossachs and the Borders was assumed to

⁵⁸ Note however that, while expenditure on trips where woodland was visited but was not the main destination is not included, the entire expenditure in the case of trips where woodland was the main destination is apportioned to the influence of the woodland, irrespective of whether other places were visited, with the survey results not allowing precise apportioning of expenditures to different destinations where several were visited.

⁵⁹ If (based upon the combined estimates from the three years of the All Forest Survey) the estimated 97,000 visits per year to FCS forests by visitors resident outside the UK for whom woodland was the only or very important reason for their visit are included, this would add a further £2m in GVA. (This is based upon average spending per trip of £61.95 in 2007/08 prices, and an associated total expenditure of £6m, and assumes, as previously, that GVA accounts for 37% of expenditure).

⁶⁰ GDP deflators were used from the HM Treasury web site:

www.hm-treasury.gov.uk/economic_data_and_tools/gdp_deflators/data_gdp_index.cfm. The latest value of the index is for 2007/08 and is 103.25, compared to 95.2 in 2004/05, giving an 8.5% increase between the three years.

⁶¹ See Hill *et al.* (2003, Table 6.14, p.112).

⁶² CJC Consulting (2006) also provides no estimates of GVA for forest-associated spending.

hold for the whole of Scotland,⁶³ applying this to the total expenditure by tourists on visits to the countryside in Scotland from the 2004/05 Scottish Recreation Survey of £1,984 million at 2007/08 prices⁶⁴ would produce an estimate of total forest-associated spending of approximately £238 million at 2007/08 prices. This translates into a GVA of around £88 million at 2007/08 prices.⁶⁵ This could be considered an under-estimate because the Scottish Recreation Survey does not include overnight costs.⁶⁶

INDICATOR 8: GROSS VALUE ADDED OF FOREST PRODUCTS AND SERVICES

With few exceptions, data is not published either on the proportion of Scottish timber used by downstream wood processing sub-sectors, or on the proportion of GVA generated by forestry in other sectors such as agriculture. An estimate of the direct GVA generated by the Scottish forestry sector associated with use of timber grown in Scotland was obtained by assuming that the share of the GVA generated by forestry corresponds to the share of forestry sector employment (FTEs) in each sub-sector.⁶⁷ This gives an estimate for total direct GVA generated by the Scottish forestry sector associated with use of timber grown in Scotland of around £304 million in 2007/08 prices (see Table 18 and Figure 5).⁶⁸

⁶³ Hill *et al.* (2003: 113) base their estimates upon the importance of forests in individuals' decisions to visit or stay in an area, with tourism expenditure partitioned by dividing the forest score by the sum of the total possible scores for all of the trip-motivating reasons specified. By contrast, CJC Consulting (2006: 17) cautions: "It would be difficult to allocate this proportion of expenditure... because forests were not within the top five categories of most frequently mentioned characteristics that were involved in decision-making for the trip."

⁶⁴ This estimate is based upon assuming a mean expenditure on visits to the countryside of £21.43 in 2007/08 prices and 93m trips to the countryside (excluding visits where forests were the main destination, as the latter are already taken into account in the forest-related GVA estimate) based upon Scottish Recreation Survey data for 2004/05, reflatd using the GDP deflator (as previously). As the SRS excludes visits by non-residents, the basis of the following very rough estimates is conservative.

⁶⁵ Assuming (as previously) that GVA accounts for 37% of turnover.

⁶⁶ The mean total expenditure attributable to forests estimated by Hill *et al.* (2003, Table 6.17, p.114) is of the order of 2-3 times higher for visitors staying overnight than day visitors from home.

⁶⁷ This represents a pioneering attempt to quantify the level of GVA generated by the industry (broadly defined) associated with the use of Scottish timber, with no estimates previously published on the contribution of Scottish timber to GVA generated in each of these sub-sectors.

⁶⁸ Estimates from Scottish Government Input-Output analysis based upon FR employment estimates for IOCs 1, 31, 32, 94, 115, 116 and 120. 100% was assumed for 2.1 and 2.2 rather than inflating GVA estimates for these sub-sectors by taking account of the higher FR estimates for FTEs than the ABI totals as some evidence suggests GVA estimates for forestry harvesting and planting in the ABI are over-estimates (Sheila Ward, *pers. com.*).

Table 18. Direct GVA of Scottish forestry in 2004 associated with Scottish timber, and share of sub-sector employment, by sub-sector (IOC)

Sub-sector (IOC)	Share of sub-sector employment (%)	Direct GVA (£m at 2007/08 prices)
Forest planting (2.1)	100	59.6
Forest harvesting (2.2)	100	46.1
Farm woodland (1)	2.8	27.5
Other road transport (including haulage) (94)	1.3	22.4
Wood processing (31)	34.1	111.4
Pulp and paper (32)	10.5	20.5
Public administration (including Local authorities) (115)	0.15	9.4
Membership organisations (120)	0.67	3.0
Research and education (116)	0.07	3.7
Total		303.6

Source: Forest Research, and 2004 Scottish Input-Output Tables⁶⁹

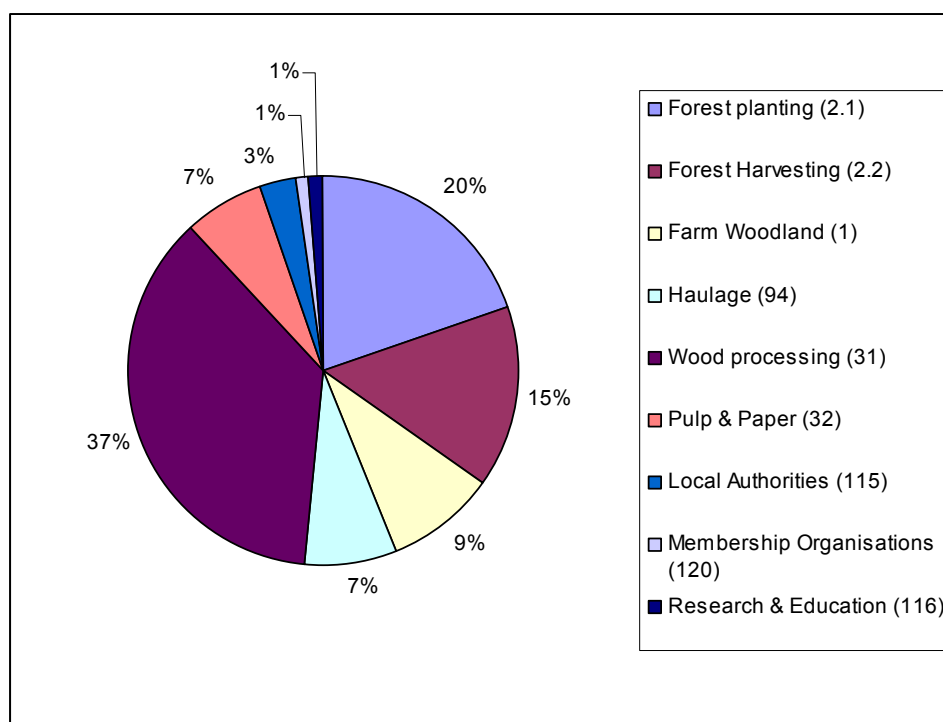


Figure 5. Direct GVA of Scottish forestry in 2004 associated with Scottish timber by sub-sector (IOC)

In addition to the direct GVA associated with Scottish timber production and processing, the sector contributes to indirect GVA through the activities of related industries such as suppliers of chemicals or transport, as well as induced GVA associated with spending of incomes earned either directly or indirectly from forestry. Direct, indirect and induced impacts

⁶⁹ Total direct GVA for forestry across all these sub-sectors including use of imported timber is estimated to be about £700 million at 2007/08 prices.

associated with Scottish-grown timber in the Scottish forestry sector are estimated in 2004 to have contributed around £460 million GVA at 2007/08 prices to the Scottish economy (see Table 19). This figure represents around 0.5% of the total GVA for the Scottish economy.⁷⁰

Table 19. GVA associated with the use of Scottish timber by the Scottish forestry sector in 2004

Effects	GVA (£m at 2007/08 prices)
Direct	303.6
Indirect	85.6
Induced	69.4
Total	458.6

Source: Scottish Government Input-Output analysis

There was little overall trend in the total GVA associated with the use of Scottish timber by the sector from 1998 to 2004, although there appears to have been a large increase in that associated with the pulp and paper industry in 2001 (see Figure 6). However, data is missing for most years for GVA associated with the manufacture of wood and wood products.

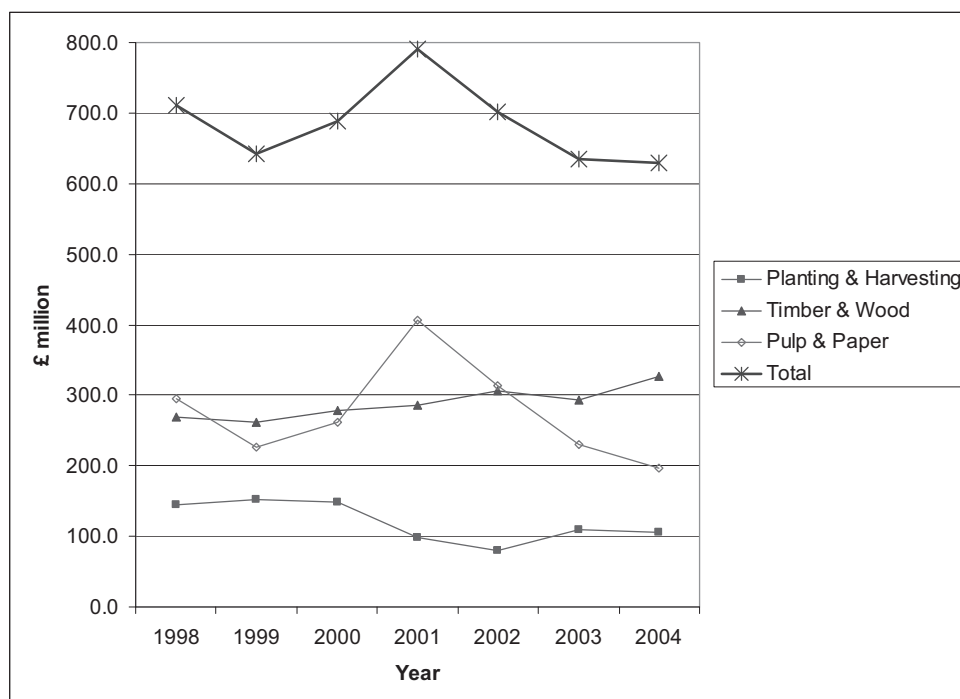


Figure 6. Trends in total GVA in timber production and processing in Scotland at constant 2007/08 prices (Source: Office for National Statistics, 2004)

Data on GVA generated by forestry businesses of different sizes is sparse. Table 20 gives data for three main sub-sectors by Standard Industrial Classification (SIC) including pulp and paperboard products under SIC 21. Using the size of businesses as a proxy measure, the

⁷⁰ Total direct, indirect and induced GVA for the forestry sector including use of imported timber is estimated to have been around £1,200 million in 2004 at 2007/08 prices. The UK GDP deflator (at market prices) from the HM Treasury website has been used throughout to reflate estimates to 2007/08 prices.

contribution of the Scottish timber industry to local economies is quite significant as more than 43% of the GVA is produced by micro and small businesses (see Table 20).

Table 20. Total GVA of Scottish forestry sector by business size

SIC	Description	Size band	GVA in 2007/08 prices (£ million)
02	Forestry, logging and related services (for 2004)	Micro 0-9	51.8
		Over 10	61.2
		Sub-total	113.0
20	Manufacture of wood and wood products (for 2000)	Micro 0-9	67.1
		Small 10-49	107.3
		Over 50	108.5
		Sub-total	282.9
21	Manufacture of pulp, paper and products (for 2004)	Micro 0-9	10.6
		Small 10-49	35.2
		Medium 50-249	141.8
		Large 250+	185.8
		Sub-total	373.4

Source: Office for National Statistics (2004)

Although the contribution of 'forestry logging and related services' (SIC 02) is lower than the contribution of 'manufacture of wood and wood products' (SIC 20), its impacts on local economies were important. Almost half (46%) of the GVA associated with 'forestry logging and related services' was produced by micro-business in 2004 compared to less than 3% of the GVA associated with 'pulp, paper and paper products manufacturing' (see Figures 7 and 8).

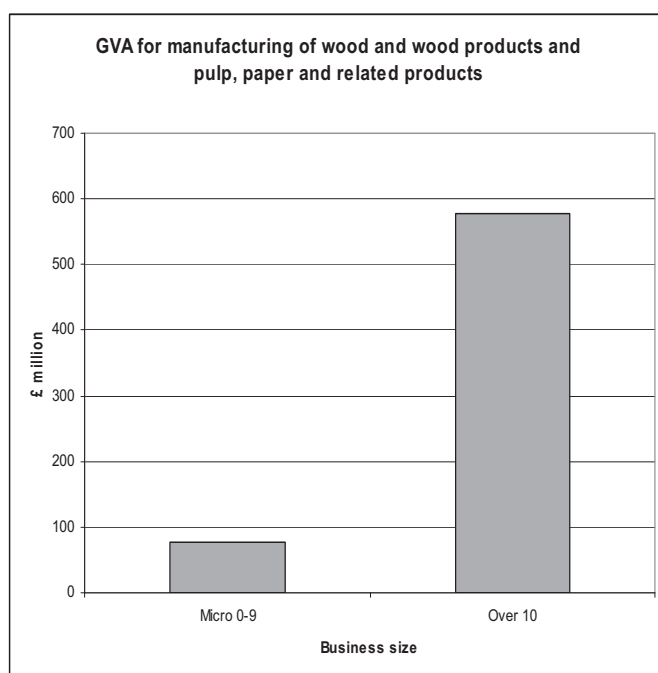


Figure 7. GVA in Scottish wood, pulp and paper manufacturing (SIC 20 and 21) by business size, at 2007/08 prices (Source: Office for National Statistics, 2004)

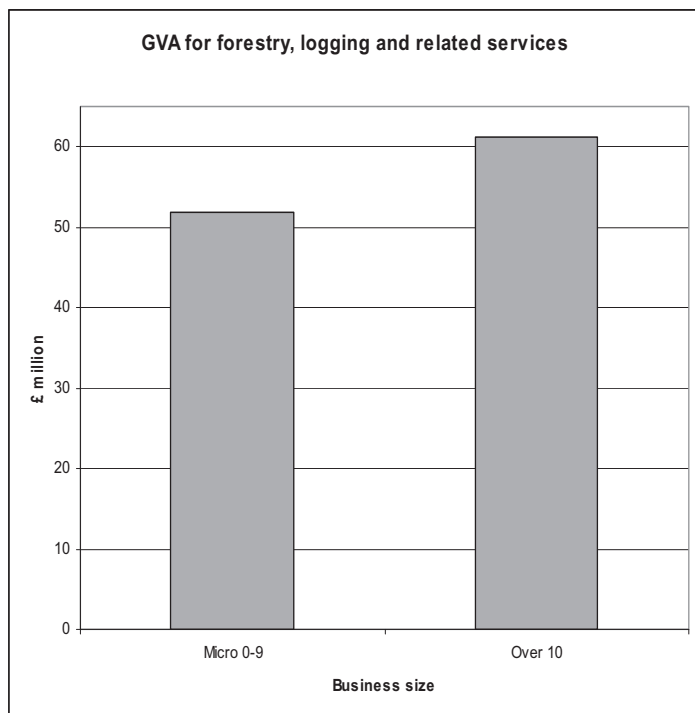


Figure 8. GVA in Scottish forestry, logging and related services (SIC 02) by business size, at 2007/08 prices (Source: Office for National Statistics, 2004)

A comparison of the estimates derived for timber production and processing (Indicators 2 and 8) with those for forest-related visitor spending (Indicators 3 and 7) shows that GVA per employee is far higher for the former than for the latter. This is unsurprising given that timber production and processing is far more capital intensive. For example, according to the ABI, average GVA per employee was 1.7 times higher in the manufacturing sector than the service sector in 2005 (49,590 compared to 29,747). Furthermore, average labour productivity increased much faster in agriculture, forestry and fisheries than in tourism and recreation over the decade 1995-2004 (Mason and Osborne, 2007).

Non-timber forest products

Information on GVA related to NTFPs is not available, although there is some incomplete data on revenue flows for specific products, which are gathered from non-woodland as well as woodland habitats and so it is not possible to attribute all revenue to forestry. Fungi is probably the most important traded NTFP in Scotland, with a harvest estimated to be worth around £400,000 per year (Dyke and Newton, 1999; see also Murray and Simcox, 2003; CJC Consulting, 2005a). Staddon provides a very approximate estimate of £500,000 per year for the value of the wild Scottish moss trade in Scotland. Tree nurseries in Scotland are estimated to spend up to £100,000 per year on mainly self-employed seed collectors (Sanderson and Predergast, 2002), while one company exports rhododendron stems for use in floral decorations, with a value of around £8,000 per week (Wong and Dickinson, 2003).

The F4P Omnibus Survey 2006 provided new data which can be used to assess the contribution of NTFPs (particularly by non-commercial uses) to livelihoods (see Table 21). As mentioned under Indicator 2, an estimated 13% of the Scottish adult population had gathered NTFPs from woodland in the previous 12 months. Of those who had gathered NTFPs, 6% (or less than 1% of the Scottish adult population) estimated the retail value of products gathered in the previous 12 months to be worth more than £50. Although revenues for most collectors

are very low, data collected as part of research by Emery *et al.* (2006) shows that for some harvesters it is not the size of the revenue associated with the trade of NTFPs that is important in maintaining a livelihood, but the timing of that money coming into the household, for example when other sources of income are scarce.

Table 21. Estimates of retail value of NTFPs in Scotland

Estimated retail value of all products gathered in the last 12 months	% of respondents who had gathered NTFPs
£0-50	87
£51-100	2
£101-500	1
£501-1000	1
Over £1000	2
Don't know	7

Source: F4P Omnibus Survey (2006)

Paul and Chapman (2007) provide tentative estimates for turnover within Scottish NTFP businesses, and for the growth of the sub-sector. Average turnover for 16 respondents was extrapolated to the approximately 150 Scottish NTFP businesses recorded for the research. Total turnover in the sub-sector is estimated at between £7 million and £22 million in 2007/08 prices, and the growth rate at between 19%-38% from 2001 to 2006. If GVA were assumed to account for 37% of turnover,⁷¹ corresponding estimates for GVA would be in the range of £2.6 million to £8.0 million.

Game

The Scottish game sector contributes direct GVA to the Scottish economy through the provision of sport shooting opportunities by providers (mainly through operational expenditure and staff costs) as well as through paid trips by participants. The game sector also contributes indirect GVA to the Scottish economy through the expenditures of providers and participants to related suppliers (reared game, clothing, accommodation, etc). Finally, GVA is created through the spending of wages and profits of staff, providers and game sector-related suppliers (induced GVA).

The Scottish game sector contributed a total of around £260 million GVA to the Scottish economy in 2007/08 prices. This included an estimated £51 million in direct GVA and £209 million in indirect and induced GVA (PACEC, 2006).⁷² Habitats used for sport shooting in the UK include woodlands, moorland, spinneys, stubbles, cover crops, beetle banks, hedgerows, grass strips, conservation headlands, release pens, wetlands, glades and rides, flight ponds and river or stream banks. As GVA associated with different habitat types is not given, GVA associated with woodlands cannot be identified

The proportion of the total GVA generated by the Scottish game sector that is associated with woodlands is unknown. However, a very approximate estimation can be made using the area of woodlands as a proportion of the total area managed for sport shooting purposes in

⁷¹ This proportion applies to Scottish agriculture according to the latest Scottish Input-Output Tables (see: www.scotland.gov.uk/Resource/Doc/133434/0054634.xls). It is also assumed to apply to forest-related and forest-associated tourism and recreation expenditure (but for a different reason).

⁷² The indirect/induced GVA was calculated by subtracting the direct GVA (£51 million) from the total (£260 million).

the UK, and assuming that this proportion is the same in Scotland as for the UK as a whole, and that the same mean GVA per hectare is generated for woodland as for the other land use types. If it is assumed that 40% of the area managed for sport shooting in Scotland is woodland,⁷³ this suggests that woodlands may contribute around £104 million to the total GVA (see Table 22).⁷⁴ This can be considered additional to the other GVA estimates for timber production and processing as it does not cover GVA generated in woodland management,⁷⁵ but there may be some overlap with GVA estimates for visitor spending.

Table 22. Contribution of woodlands to GVA in the Scottish game sector

Effects	GVA (£ million) in 2007/08 prices
Direct ⁷⁶	20
Indirect / Induced ⁷⁷	84
Total	104

In Scotland, the majority of the shooting opportunities are provided by an estate (PACEC, 2006).⁷⁸ The contribution of the FC is likely to be significant, especially for deer stalking. However, the extent of this impact is not clearly stated.

A very approximate estimate of the GVA associated with woodland generated by different organisations providing sport shooting can be made by applying the percentage of opportunities provided in the Scottish game sector as a whole to the total GVA associated with woodland (£104 million) (see Table 23).

Table 23. GVA by organisation providing sport shooting in Scotland

Type of organisation providing sport shooting in Scotland	%	GVA (£ million) in 2007/08 prices
Part of estate	87	91
Part of tenant farm	5	5
Shooting tenant	13	13
Club	2	2
Syndicates	13	13
Total⁷⁹	100	104

Source: Percentages from PACEC (2006)

Economic regeneration

Currently there are no reliable estimates of GVA due to forestry contributing to economic regeneration. Adopting a broad definition of economic regeneration, Dawson (2006) argues that there are several relevant categories to consider. These include indirect and induced impacts of timber production and processing (estimates for which have been provided earlier

⁷³ At the UK level, there are 830,000 ha of woodlands out of a total of 2,067,000 ha of land managed for sport shooting (i.e. 40%).

⁷⁴ This could be an over-estimate if the GVA associated with woodlands is lower than the average.

⁷⁵ See PACEC (2006: 50).

⁷⁶ i.e. £51 million*0.4.

⁷⁷ i.e. £209 million*0.4.

⁷⁸ PACEC (2006: 10) adopts a broad definition of an estate as "land which is not a tenant farm".

⁷⁹ Percentages from PACEC (2006) do not add up to 100% as some providers are classified in more than one category. For this reason, the sum of the GVA for each category is higher than the total.

in this section),⁸⁰ uplift in residential⁸¹ and business property prices, and residential and commercial 'halo' effects associated with additional expenditure by households and firms which relocate to areas near woodland to enjoy the higher environmental quality.

INDICATOR 9: PUBLIC PERCEPTIONS OF THE CONTRIBUTION OF FORESTRY TO THE ECONOMY

As part of the F4P Omnibus Survey 2006, Scottish adults were asked whether woodlands in Scotland are important in helping people to earn a living or make ends meet. 56% agreed and 18% strongly agreed. This is a similar result to the 2007 UK Public Opinion of Forestry in which 44% of Scottish respondents agreed and 18% strongly agreed to the same question.

The level of agreement or strong agreement in the F4P Omnibus Survey 2006 was lower among the 16-34 year age group (64%) than the 35-54 (79%) and 55+ (78%) age groups, possibly because younger people did not feel that forestry jobs were as relevant to them as they might once have been to the older age groups (see Figure 9).

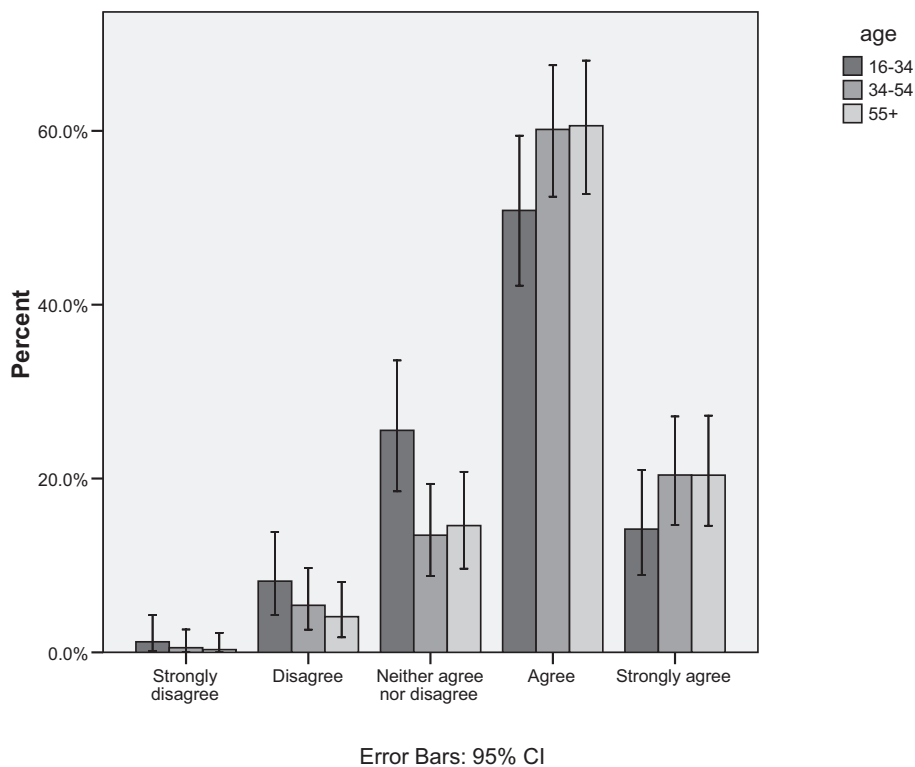


Figure 9. Percentage of respondents who perceived woodlands in Scotland to be important in helping people to earn a living or make ends meet, by age class (Source: F4P Omnibus Survey 2006)

⁸⁰ Viewed as primarily rural effects, impacts of forestry on urban regeneration are argued to be potentially even larger.

⁸¹ In the order of 5%.

The Scottish Public Opinion of Forestry Surveys asked Scottish adult respondents to select, from a list of 17 possible public benefits, good reasons to support Scottish forestry with public money. 90% of respondents selected at least one benefit. There were three economic benefits listed, and overall 59% of Scottish adult respondents gave at least one economic reason to support forestry with public money. Percentages for each economic benefit are given in Table 24, for the last three surveys.

Table 24. Percentages who suggest that the following are good reasons to support Scottish forestry with public money

Reason	2003	2005	2007
To support the economy in rural areas	37	37	46
To help rural tourism	32	27	43
To provide timber for sawmills and wood processing	17	22	28

Source: Scotland Public Opinion of Forestry Survey 2007 (Base: 2003 = 1,018, 2005 = 1,009, 2007 = 1,007)

2.3 RECREATION AND ACCESSIBILITY

KEY FINDINGS

The percentage of Scottish adults who visited Scottish woodlands varied between 56% in 2005/06 (August 2005 to August 2006), and 41% in 2006/07 (August 2006 to August 2007). This equates to 2.3 and 1.7 million people respectively. The substantial decline between 2005/06 and 2006/07 is likely to be mainly due to the unusually wet summer of 2007.

It is estimated that the annual number of visits by Scottish adults ranged between 68 million in 2005/06 and 37 million in 2006/07. At least six million of these visits were made to forests managed by Forestry Commission Scotland. Although more visits are made to non-Forestry Commission woodlands, on average, visits to Forestry Commission woodlands were of a longer duration and involved longer round trips.

In addition, in 2006/07 an estimated 63.5% of Scottish children made a total of 11.6 million visits to Scottish woodlands.

An estimated 51% of visits to Scottish woodlands by Scottish adults were made while accompanied by a dog.

Adults from the most deprived areas in Scotland, those from urban areas, C2 and DE socio-economic groups, and the 55+ age class, were all significantly less likely to have visited woodlands in the previous 12 months than those from other social groups.

The non-market value of visits to Scottish woodlands by Scottish adults is estimated to be between £44 million and £76 million per year.

Around 1500 public events were organised by Forestry Commission Scotland between August 2006 and August 2007, involving an estimated total of 134,000 visits.

72% of Scottish adults surveyed stated that they had woodland near to where they lived (within a 10 minute walk). Of those who had local woodland, 22% did not feel safe visiting their local woodland, with women more likely to feel unsafe than men.

BACKGROUND

This theme is concerned with levels of recreational use of forests and woodlands in Scotland. Recreational benefits are defined for the purposes of this study as those derived through use of woodlands for any non-work related purpose. Accessibility is seen to be more than just physical access, and includes the full range of economic, social, cultural and psychological factors (or barriers) that influence decisions to visit woodlands for recreation. For example, some groups of people may feel unsafe while visiting woodlands; others may feel out of place in a woodland setting among visitors that are not predominantly like them, while people without a car may not visit rural woodland recreational sites due to lack of transport.

Another way to conceptualise accessibility is by the level of engagement with woodland. Weldon *et al.* (2007) provide a continuum of five levels of access, which has been adapted below:

1. Virtual access to woodland (through the media or internet)
2. Access to woodland through a view

3. Visiting or being in a woodland
4. Active engagement (e.g. through volunteering or employment in physical work)
5. Ownership or active management of woodland

This section is concerned primarily with the benefits derived through levels 2 and 3 identified above (together with 'learning and education' and 'health and well-being'). Level 1 is considered under 'culture and landscape'; level 4 is covered by 'employment and volunteering' and levels 4 and 5 are covered primarily by the 'community capacity' theme.

Being in a woodland, or active engagement with woodland, provides experiential contact with nature, and Pyle (2002: 316) has suggested that, if this contact is diminished, negative impacts may be realised at different levels, as follows:

- Physically from lack of fresh air and exercise
- Intellectually from not developing awareness, observation and imagination
- Emotionally by not developing attachments to special/specific places
- Morally through lack of awareness of the ethical and moral dimensions to human interactions with the natural world

One of the simplest ways to quantify these benefits is to estimate the proportion of the population who have visited forests in a given time period (i.e. one year), and the total number of visits that are made in that period. This section provides a range of estimates for both of these indicators by combining results from several surveys, including those commissioned for this study.

Levels of recreational use is also a measure of the accessibility of woodlands, and one of the primary aims of the Scottish Forestry Strategy is to create and improve public access as a means to increase other benefits such as health and well-being, and education and learning and 'quality of life'. Thus, while the benefits of accessibility are measured here under the title 'recreation and accessibility', the indicators also measure levels of visit-related benefits that could also be recorded under several other themes in the report.

Measuring total visitor and visit numbers as an indicator of recreational benefits has its limitations, since it assumes that all visits by all people have the same value to the individual. It would be preferable to include a measure of the quality of experience from each visit. One way to do this is to separate total visits according to different activities (such as dog walking, walking, mountain biking), types of person (such as age, gender, socio-economic group), types of forest, and geographical location, and to quantify the relative value of each kind of visit, possibly through economic valuation methods such as Travel Cost and Contingent Valuation. A separation into types of visitor, and types of visit, was incorporated into the F4P Omnibus Surveys reported here, although previous research that has been carried out to provide economic values for different types of visitor, and visit, is not considered sufficiently robust to be of use by this project.

INDICATOR 10: NUMBER OF VISITORS AND VISITS TO FORESTS

This section presents estimates for number of visitors and number of visits, estimated from the results of several surveys that have been carried out in Scotland over the last five years, as follows:

- F4P Omnibus Surveys 2006 and 2007 (TNS, 2006a and 2007)
- Scottish Recreation Survey, 2004/05 (TNS, 2006b)
- GB Day Visit Survey, 2002/03 (GBDVS, 2004)

- Public Opinion of Forestry Surveys, for UK (or GB) and Scotland, 2003, 2005 and 2007 (FC, 2003a, 2003b, 2005a, 2005b, 2007a and 2007b)
- All Forests Visitor Survey, 2004/05, 2005/06 and 2006/07 (TNS, 2006c, 2006d, 2008a and 2008b)

The F4P Omnibus Surveys (2006 and 2007) and Public Opinion of Forestry (POF) Surveys (2003, 2005 and 2007) used a similar methodology, and provide the most useful set of estimates for visit and visitor numbers. They are based on the following two measures:

1. The percentage of adults who visited forests in the previous 12 months, from which an estimate can be derived for the total number of people who visited forests annually.
2. The frequency of visits (for those who had visited forest in the previous 12 months), from which an estimate can be derived for the total annual number of visits.

From these surveys, eight different estimates for number of visitors and six estimates for number of visits can be derived. These are given in Table 25. In addition, an estimate for number of visits can be derived from the Scottish Recreation Survey 2004/05 and an estimate for both visitors and visits can be derived from the GB Day Visits Survey 2002/03, but both use different methodologies and definitions of forest visits, and are thus not directly comparable with the other surveys. However, the results are still revealing, and a brief discussion of what each survey can tell us is given below.

Table 25. Estimates for annual number of visits by adults resident in Scotland, and annual number of visitors, to woodlands and forests in Scotland

Study	Period surveyed	% of adult population who visited in previous 12 months	Number of adult visitors in the previous 12 months (million)	Number of visits (million)
F4P Omnibus Survey 2007	Aug 06 – Aug 07	41%	1.7	37
F4P Omnibus Survey 2006	Aug 05 – Aug 06	56%	2.3	68
Scotland POF* 2007	Feb 06 – Feb 07	72%	3.0	60
UK POF* 2007 (Scottish respondents)	Feb 06 – Feb 07	74%	3.1	89
Scotland POF* 2005	Feb 04 – Feb 05	50%	2.1	-
GB POF* 2005 (Scottish respondents)	Feb 04 – Feb 05	64%	2.7	51
Scotland POF* 2003	Feb 02 – Feb 03	64%	2.7	-
UK POF* 2003 (Scottish respondents)	Feb 02 – Feb 03	57%	2.3	37

*Public Opinion of Forestry Survey

1. F4P Omnibus Surveys 2006 and 2007

In August 2006, the F4P Omnibus Survey (TNS, 2006a) asked a representative sample of the adult population of Scotland (16 and over) if they had visited any Scottish forests or woodlands in the previous 12 months. 56% said they had (+/-5.0% using 95% confidence

intervals). The Scottish adult population size can be obtained for the mid-point in the year (i.e. 30 June) for different years from the General Register Office for Scotland (GROS, 2007). From these data it is possible to estimate the population for the mid-point for each survey period discussed here. (See: www.gro-scotland.gov.uk/statistics/population/index.html). For example, for the F4P Omnibus Survey 2006 a population size of 4,180,000 adults was assumed. Therefore the total number of Scottish adults who visited Scottish forests in the previous 12 months (i.e. from mid-August 2005 to mid-August 2006) is estimated to be 2.3 million.

In August 2007 the question was repeated, and a substantially lower figure of 41% was obtained (+/-4.6% using 95% confidence intervals).⁸² Using an updated figure for the population size (4,195,000), the total number of Scottish adults who visited Scottish forests in the previous 12 months (i.e. from mid-August 2006 to mid-August 2007) is estimated to be just 1.7 million. The most likely explanation for this apparent decline is the weather during the summer of 2007, which had unusually high rainfall and low sunshine levels. Data from the Meteorological Office show that there were 110 fewer sunshine hours, and 150 mm more rainfall, in the summer of 2007 (June to August) compared to the summer of 2006. As indicated in Table 26, the decline in numbers of people visiting between 2007 and 2006 can be seen across all social groups. There was no significant difference at the 95% confidence interval level between proportions of visitors in the two years according to gender, age and socio-economic group. However, Table 26 indicates that, for a given year, there were differences in the number of adults who had visited woodlands from different social groups, as discussed in the next sub-section.

Table 26. Decline in percentage of adults visiting woodlands between 2005/06 and 2006/07 according to gender, age and socio-economic group

	Percentage of adults visiting woodlands between 2005/06 and 2006/07									
	Total	Gender		Age			Socio-economic group			
		Male	Female	16-34	35-54	55+	AB	C1	C2	DE
2005/06	56	57	54	63	64	42	69	63	49	43
2006/07	41	45	37	42	49	33	50	46	34	32
% difference	-15	-12	-17	-21	-15	-9	-19	-17	-15	-11

Source: F4P Omnibus Surveys 2006 and 2007 (TNS, 2006a and 2007)

In August 2006, the F4P Omnibus Survey asked all respondents, who had visited forests in the previous 12 months, how frequently they had visited woodlands in the previous winter (i.e. between October 2005 and March 2006) and how frequently they were visiting woodlands during the current summer period (i.e. between April 2006 and September 2007). For both winter and summer, they were asked to respond by choosing one of five frequency classes: 'several times per week'; 'several times per month'; 'about once a month'; 'less often'; and 'never'. From the data it is possible to calculate the total number of visits that were made in Scotland. If, on average, these classes are conservatively assumed to mean: twice per week; twice per month; once per month; twice per year; and no visits, and since the total number of visitors is estimated to be 2.3 million, then the total number of visits by adults to Scottish woodlands between September 2005 and August 2006 is estimated to be 68 million (+/-5.5 million using 95% confidence intervals). Annex 5 (Tables A2-A4) gives the calculations for the visit estimates from all eight F4P and POF Surveys.

⁸² Analysis of car counters at some of the bigger sites on the FCS estate suggest that the number of visits increased by around 8% in 2007.

The F4P Omnibus Survey 2007 repeated the questions on frequency of visits. If the same conservative assumptions are made for frequency classes (and using the estimate of 1.7 million adult visitors cited above) the total number of visits was just 37 million (+/- 4.2 million using 95% confidence intervals). Again, this decline from 2006 may be explained by the high rainfall and low levels of sunshine in the summer of 2007.

The totals are highly dependent on the assumptions that are made to interpret each frequency class, especially for the class 'several times a week'. For this reason, the Survey in 2007 included additional questions that sought to overcome this uncertainty. For example, for those who stated that they visited 'several times a week', they were then asked to provide a single figure for the average number of times that they visited per week. The results we obtained were substantially higher: 4.2 times per week; 3.5 times per month; once a month; 2.1 times per year; and no visits. Using these frequencies, the total annual number of visits (between September 2006 and August 2007) increases to 72 million.

In order to derive a range of values for total annual visit numbers that are calculated with a comparable methodology, it was decided to use the conservative frequency classes given above for the Public Opinion of Forestry Surveys (discussed below) and the two F4P Omnibus Surveys. This was because, while the higher frequency estimates derived from the F4P Omnibus Survey 2007 can be applied to the 2007 data, they cannot simply be transferred to the data for the 2006 Survey (which would produce a total of some 130 million visits) or the Public Opinion of Forestry Surveys, because a different set of frequencies would have been obtained for each class. Indeed, the poor weather in 2007 might lead us to conclude that frequencies obtained in previous years would have been even higher. Also, there are doubts about the ability of people to recollect frequencies of visits accurately. Furthermore, the figures derived, even with conservative assumptions, are higher than other surveys (see below). An additional reason why some people may overestimate the average number of times a week that they visit is that they may forget that they don't go out so much in bad weather, during holidays abroad, and during periods of sickness (see also discussion below). Thus, the conservative figures are used here for all surveys.

2. Public Opinion of Forestry Surveys

The Public Opinion of Forestry (POF) Omnibus Surveys are conducted every two years on behalf of the FC. They are carried out at UK level (or GB level in 2005) with around 4,000 adult respondents, and also at country level (each with around 1000 adult respondents). The results for the Scottish POF for 2003, 2005 and 2007 provide three values for number of visitors to Scottish woodlands. Three more values can be obtained from the subset of Scottish respondents in the UK (or GB) POF surveys for the same three years. The results from all the surveys are given in Table 25.

For all of these surveys, informants were asked to recall whether they had visited 'in the last few years', rather than 'in the last 12 months', which has a small but significant impact on the estimate of number of visitors. However, for the UK (or GB) POF, additional questions were asked about frequency of visits in the most recent summer and winter, and it is possible to use these data to derive an estimate for number of visitors during the previous summer.

Neither the Scottish POF 2005 nor the Scottish POF 2003 surveys asked respondents to recall the frequency of their woodland visits, so it is not possible to use the data to derive estimates of number of visits. However, the relevant questions were inserted in the Scottish POF 2007. From this dataset, and using the same conservative assumptions for frequency classes, we estimate that annual number of visits to be 60 million (+/- 5.0 million using 95% confidence intervals) between February 2006 and February 2007.

Similarly, the frequency questions were asked as part of the GB (or UK) POF Surveys, and using the subset of Scottish respondents to each of these Surveys we can estimate annual number of visits to be 89 million in 2007 (between February 2006 and February 2007), 51 million in 2005 (between February 2004 to February 2005) and 37 million in 2003 (between February 2002 and February 2003). All of these estimates are based upon contemporary population sizes obtained from the General Register Office for Scotland. Importantly, however, these estimates are based on a much smaller sample size (around 250 respondents instead of 1000 for the Scottish POF and F4P Surveys). They are consistent with the values derived from the latter surveys, but they have not been used directly to derive a headline range of estimates quoted in this report. They provide supporting background information, and possibly they provide some evidence of trend. However it is necessary to highlight that the 50% results from the Scotland POF Survey 2005 may be due to use of a different research company (see discussion below).

3. Scottish Recreation Survey, 2004/05

The Scottish Recreation Survey is a much larger household survey involving around 1000 respondents (aged 16 and over) per month, organised jointly by Scottish Natural Heritage and FCS. It commenced in 2003/04 and will run for ten years. Data is available for 2003/04 and 2004/05 (TNS 2005 and 2006b). Respondents were asked about visits to the outdoors in the previous 12 months for the purposes of recreation or leisure. By 'outdoors' the survey meant "open spaces in the countryside as well as in towns and cities such as woodland, parks, farmland, paths and beaches", and this definition was explained to respondents at the start of the questionnaire.

It is not possible to use the data directly from the report to estimate the total number of visitors to woodlands. However, the Scottish Recreation Survey can be used to estimate the total number of visits, using a different methodology to the F4P Omnibus Surveys and POF Surveys. For 2003/04, a broad estimate of the total number of visits to the outdoors is given at around 189 million (between July 2003 and June 2004). Of these, 18% were to woodlands as the main destination, while 26% included time spent at woodlands (regardless of whether or not woodlands were the main destination). Thus, the total number of visits to woodland in the previous 12 months (July 2003 to June 2004) is estimated to be 49 million (189×0.26). Similarly, in 2004/05, the total number of visits to the outdoors is given as 214 million, of which 16% were to woodlands as the main destination, and 23% included time spent at woodlands. The total number of visits to woodland in the previous 12 months (July 2004 to June 2005) is estimated to be 49 million (214×0.23), coincidentally the same figure as that derived from the previous year's survey.

4. GB Day Visit Survey 2002/03

The GB Day Visit Survey was a regular household survey sponsored by a consortium of national agencies responsible for recreation and tourism, and co-ordinated by the Countryside Agency (now Natural England) (GBDVS 2004). The survey is no longer run across Great Britain, and the last year in which Scotland was included was in 2002/03, which involved around 1,500 respondents in Scotland (aged 16 and over). The survey used a different methodology and was of more limited scope than the other surveys discussed here. It sought to provide estimates of home-based leisure day visits, defined as "round trips made from home for leisure purposes to locations anywhere in Great Britain". The trip must have taken place within the same day, but there was no lower time limit. Interviewing took place through random sampling throughout the March 2002 – March 2003 period. Respondents were asked about visits taken from home in the previous two weeks, which was later scaled up to provide an estimate for a 12 month period.

In 2002/03 the survey estimated that 36% of the adult population resident in Scotland visited a wood or forest in the previous 12 months. This figure is much lower than the estimates derived by other surveys discussed here. With an adult population in Scotland of 4.1 million

in 2002/03, the total number of visitors to woodlands can be estimated from these data to have been 1.5 million.

The GBDVS also estimated that there had been 18 million visits to wood or forest in the previous 12 months. Estimates from GBDVS surveys from previous years were 18 million (1994), 26 million (1996) and 22 million (1998). Again, all of these estimates are considerably lower than the figures derived by all other surveys discussed here.

5. All Forests Visitor Survey, 2004-07

A major survey was commissioned by FCS to measure volume of visitors and visits across FCS forests, and to obtain information on visitor profiles. Fieldwork was spread across a three year period, from June 2004 to June 2007. In each year a sample of five of the fifteen Forest Districts in Scotland were surveyed.⁸³ Questionnaires were filled in by surveyors located at each entry point at a representative sample comprising approximately 20% of the FCS forests in each District. Following a number of adjustments to the data, the overall estimate for annual number of visits to FCS forests was concluded to be 8.7 million (TNS, 2008b).

This figure includes adults and children, and to make it comparable with results from other surveys described here, which only provide estimates for adults, it is necessary to exclude the children from this total. For the three years of the All Forests Survey, children represented 16% of all visitors. Thus, we estimate that the total number of adult visits per year was 7.3 million ($0.84 \times 8.7\text{m}$). Similarly the All Forests Survey included visits by non-Scottish residents, and this requires a further adjustment since other surveys only sampled Scottish residents. 85% of visitors were from Scotland. The total number of visits to FC forests by Scottish adults thus becomes 6.2 million ($7.3\text{m} \times 0.85$).

Data of comparable quality is not available for the non-FC woods and forests in Scotland. The number of visits to non-FC woodlands by adults resident in Scotland can be estimated tentatively by subtracting the figure for visits to FC woodlands derived from the All Forests Survey (6 million) from the range of figures for visits to woodlands of all ownership categories, to obtain a tentative estimate of between 31 and 62 million.

The proportion of visits to forests of all types of ownership that are made to FCS forests is lower, according to this methodology, than is implied when the public are asked to identify the owner of the forests that they visit. This was asked as part of the Scottish Recreation Survey and GBDVS. While there are a number of reasons why the All Forests Survey, which measured visits to FC forests, could be a slight underestimate, there is evidence from other sources that supports the figure of 6 million derived from this survey. Monitoring and expert judgement by Forest District Managers in Scotland has provided a comparable total, and analysis of UKDVS data also concluded that approximately 5 million visits to the FC estate was reasonable.

While these data suggest that more visits were made to non-FC forests, on average, visits to FC forests were of a longer duration and involved longer round trips. Using the entire ScRS dataset (2003-07), and weighting for number of visits, it can be seen that 27% of FC visits were three hours or more in duration compared to 22% of non-FC forest visits, and that 46% of FC visits involved round trips of six miles or more compared to 33% of non-FC forest visits.

⁸³ Since the survey began, Kincardine and Buchan Forest Districts were merged to form Aberdeenshire Forest District.

Discussion

Several reasons may account for differences in estimates derived from the surveys discussed above. Real changes in numbers of visits over time may account for some of the difference, for example between the dry summer of 2006 and the wet summer of 2007, as discussed above. Methodological factors such as differences in sample populations, time of sampling, frequency of sampling and sampling error, and changes in Omnibus Survey provider may also account for variations. There were also differences in the ways in which the survey questions were framed and defined, as follows:

A survey that is seen to be asking more detailed forest or woodland related questions such as the F4P Surveys and POF Surveys could cause respondents to focus harder on past visits to woodlands, and to recall more information, thereby raising the total number of visitors and visits.

Some people may overestimate the average number of times a week that they visit because they may forget that they don't go out so much in bad weather, during holidays abroad, and during periods of sickness.

As discussed above, the POF surveys asked about visits 'in the last few years' whereas the F4P Survey asked about 'the last 12 months'. The affect on proportion of the population who have visited caused by this difference in scope appears to be small, and it had a very small affect on the total number of visits.

The F4P Surveys provided a broad definition of woodlands and forests whereas the POF surveys did not provide a definition. Thus, respondents for the F4P Surveys may have judged that a greater proportion of their outdoor trips included visits to woodlands than for the POF respondents. Despite this possibility, the F4P Survey 2007 gave a lower estimate than the corresponding POF Survey carried out earlier in the same year.

A further consideration is that the F4P Survey was carried out in August whereas POF Surveys are carried out in February. If respondents base their estimates for the previous 12 months on recollections of more recent events, then the POF may derive lower estimates than for the F4P Survey because fewer visits were made during winter. Yet, as noted, the F4P Survey 2007 gave a lower estimate.

Regarding the low estimate derived by the GBDVS 2002/03, respondents may have perceived, correctly, that the GBDVS was asking about 'leisure day visits', which may have constrained the kind of visits to woodlands that they chose to recall. As a result, they may not have recorded short, regular trips to local woodlands, either because these trips involved dog walking and were seen largely as a necessity rather than 'leisure' or 'recreation', or because the trips were too short and insignificant to be called a 'proper' leisure day visit. Analysis carried out on earlier GB/UKDVS surveys suggest that, compared to the numbers reported, similar numbers of shorter trips may have been taken, but not counted. This observation provides further evidence that the range of number of visits quoted in this report is a reasonable estimate.

Similarly, the ScRS is explicitly concerned with 'outdoor trips for recreation or leisure', and possibly its scope was seen to be broader than for the GBDVS, giving correspondingly larger estimates than the GBDVS.

In the ScRS, the option 'woodland/forest' is first on the list of locations that respondents had to choose from, possibly leading to an increased proportion of positive responses. This is a phenomenon that is acknowledged by market research companies.

Both the GBDVS and ScRS place less emphasis on dog walking as a leisure or recreational activity, which may also have reduced the number of respondents who considered that dog walking was relevant to the question. The GBDVS makes no mention of dog walking, while the ScRS does not list dog walking as a recreational activity, but only records the number of trips on which a dog accompanied the person or family (20 percent). The F4P Survey 2007 concluded that dog walking accounted for 51% of visits to woodlands and forests. In the F4P Survey 2006, 57% of people who visited woodlands several times per week were accompanied by a dog (although some of their visits involved other activities as well or instead). Using the conservative assumptions for frequency classes, dog walking could therefore account for the entire difference between the upper estimate of total visits used in this report (89 million visits, derived from the UK POF 2007), and the estimate from the ScRS (49 million visits). Dog walking cannot, however, account for the entire difference between this upper estimate and the estimate from the GBDVS 2002/03 (18 million visits) because, as mentioned above, the scope of the latter was constrained by the focus on 'formal' leisure day visits.

Conclusions

For the reasons outlined, estimates from both the GBDVS and ScRS were omitted from the selection of a range of values for this indicator. Also the UK (and GB) POF estimates were not used due to the small sample size for Scottish respondents. The headline range of figures that is concluded from this work only used estimates from the F4P Omnibus Surveys and Scotland POF Surveys given in Table 25. From these data, then, the annual number of visitors from the Scottish adult population to woodlands and forests in Scotland ranged between 1.7 and 2.3 million. The number of visits, using conservative assumptions, ranged between 37 and 68 million.

Number of visits by children and other social groups

Number of visits by children

The F4P Omnibus Survey 2007 asked questions that allow us to estimate the total number of visits by children under 16 years in the previous 12 months. 63.5% of children (+/- 6.3% using 95% confidence intervals) visited woodlands. Interestingly, this proportion was significantly higher than that for adults derived from the same survey (41%). Using the same conservative assumptions for frequency classes, 11.6 million visits were made by children, both accompanied and unaccompanied. Note that these figures are based upon estimates provided by individual parents or guardians on behalf of their children, rather than directly from the children themselves.

Number of visitors by gender, age, socio-economic group and ethnic group

Table 26 indicates that, for a given year, there were differences in the number of adults who had visited woodlands from different social groups. Male adults, people aged between 35-54 years, and people from AB and C1 socio-economic groups were all more likely to have visited. Although not significant due to the low sample size, the data also suggests lower proportions of people from black and minority ethnic groups visited woodland than from other groups (53% and 56% respectively in the period from August 2005 to August 2006).

Number of visitors and visits by people from deprived areas

TNS were asked to separate the results of the F4P Omnibus Survey data for 2006 and 2007 into two levels of deprivation: respondents living in the 15% most deprived areas, and the remaining 85%. This was done using the Scottish Index of Multiple Deprivation (SIMD) which categorises all postcodes in Scotland according to several different deprivation classes. The SIMD combines several socio-economic indicators of deprivation, including income and access to education and healthcare, and is a more accurate way of identifying and analysing

important socio-economic differences between areas than through the use of the categories A, B, C1, C2, D and E, which are based on employment status and type. The estimates for number of adults who visited in the previous 12 months, and number of visits made by those adults, from the F4P Surveys in 2006 and 2007, were separated according to these two deprivation categories (see Table 27).

The number of respondents (from a total of 998 in the 2007 Survey) who were from the 15% most deprived areas in Scotland was 142. Of these, 91 were resident in the west of Scotland, 50 in the south and east, and just one respondent in the north. This skewed distribution of deprivation can be explained largely by the fact that most deprived areas, as defined by the SIMD, are located in cities in the central belt of Scotland.

Table 27. Percentage of adults, and average number of visits per adult, who visited in the previous 12 months, for the most deprived 15% and remaining 85% of areas in Scotland

Year of survey	Percentage of adults who visited in the previous 12 months			Average number of visits per adult who visited in the previous 12 months ⁸⁴		
	Most deprived 15%	Remaining 85%	Average	Most deprived 15%	Remaining 85%	Average
2005/06	40.6% (+/- 11.7%)	58.3% (+/- 5.0%)	56%	8.5 (+/- 4.7)	17.6 (+/- 3.5)	16.3
2006/07	30.5% (+/- 11.5%)	42.4% (+/- 5.0%)	41%	6.7 (+/- 4.7)	9.2 (+/- 2.9)	8.9

Source: F4P Omnibus Surveys 2006 and 2007 (TNS, 2006a and 2007)

The data for the F4P Omnibus Survey 2007 suggest that there is an important relationship between parenthood, deprivation, and the percentage of adults visiting woodlands. For adults from the 15% most deprived areas, the proportion who had visited woodland in the previous 12 months was approximately the same for adults with children (33%) and adults without children (30%). However, for the remaining 85% of the adult population, there was a large difference depending upon whether or not the respondent had children. For those with children, 56% had visited woodlands, but for those without children only 36% had visited – a figure only slightly higher than for respondents from deprived areas. The results are given in Table 28. They suggest that responsibility for children can act as an incentive for adults to visit woodlands, except for adults from deprived areas who either do not wish to, or are unable to, visit woodlands more, perhaps due to barriers such as lack of transport or time.

Table 28. Percentage of adults visiting woodland in 2006/07, for parents with children and parents without children, and for deprived and non-deprived areas in Scotland

	Percentage of adults who visited woodlands in 2006/07	
	15% most deprived	Remaining 85%
Adults with children	33%	56%
Adults without children	30%	36%

Source: F4P Omnibus Surveys 2006 and 2007 (TNS, 2006a and 2007)

Number of visitors and visits from people living in rural and urban areas

The F4P Survey results for 2006 and 2007 were also separated for respondents from urban, rural and remote rural areas. This was based upon data from the Scottish Government which

⁸⁴ The frequencies of visits in Table 27 use the same assumptions as those used in Table 25.

categorises all postcodes according to these three categories.⁸⁵ The data was used to derive separate estimates for each type of location for numbers of visitors, and numbers of visits, in the previous 12 months (See Table 29). The results for rural and remote rural are aggregated (and referred to as 'non-urban') because the sample size from remote rural areas was too small.⁸⁶

Table 29. Percentage of adults, and average number of visits per adult, who visited in the previous 12 months, from urban and non-urban areas of Scotland

Year of survey	Percentage of adults who visited in the previous 12 months			Average number of visits per adult who visited in the previous 12 months		
	Urban	Non-urban	Average	Urban	Non-urban	Average
2005/06	53% (+/- 5.4)	63% (+/- 8.6)	56%	14.6 (+/- 3.5)	21.5 (+/- 5.3)	16.3
2006/07	37% (+/- 5.3)	50% (+/- 8.8)	41%	6.7 (+/- 2.8)	15.2 (+/- 5.0)	8.9

Source: F4P Omnibus Surveys 2006 and 2007 (TNS, 2006a and 2007)

The results indicate that a lower proportion of the urban adult population visit woodlands in a 12 month period, and that those who do visit woodlands do so less frequently.

INDICATOR 11: PERCENTAGE OF VISITS INVOLVING DIFFERENT ACTIVITIES

The F4P Omnibus Surveys 2006 and 2007 included questions to determine the percentage of adult visitors who had carried out each of 15 different recreational activities while visiting woodlands in the previous 12 months. The results are presented in Table 30, with activities ranked according to average frequency for the two years. The results show that percentages of adults who undertook each activity remained constant between the two years despite the poorer weather in 2007. However, there was a decrease in the number of occasions that each activity took place.

The F4P Omnibus Survey 2007 asked additional questions, which allow us to estimate the number of visits that involved each of these recreational activities. These are also given in Table 30 with activities listed in the same order as before for comparison. The greatest difference in the ranking of activities is for dog walking. While 30% of adults had walked a dog while visiting woodlands (in both 2005/06 and 2006/07), 51% of visits involved dog walking (in 2007). This is because dog walking accounts for a very large proportion of people who identified themselves as belonging to the highest frequency class of 'several visits a week'.

Of relevance here, the F4P Survey 2007 also asked about use of local woodlands, and from this we can conclude that dog walkers visited their local woodland on 43% of their visits, while non-dog walkers visited local woodland on just 28% of their visits.

⁸⁵ Rural areas are defined by the Scottish Government as settlements with a population of less than 3,000. These are split into a) accessible rural areas (with less than 30 minutes drive time to the nearest settlement with a population of 10,000 or more), and b) remote rural areas (with greater than 30 minutes drive time). See www.scotland.gov.uk/Publications/2007/07/20145359/3.

⁸⁶ In 2007 there were 714 respondents from urban areas, 210 from accessible rural and 42 from remote rural with 32 not specified. In 2006 there were 741 urban, 165 accessible rural, 87 remote rural, and 22 not specified.

Table 30. Percentage of adults (who had visited woodlands in the previous 12 months) undertaking different recreational activities in woodlands in 2005/06 and 2006/07, and percentage of all visits involving those activities in 2006/07

Activity	Percentage of adults undertaking the activity		Percentage of all visits involving the activity
	2006	2007	2007
Walking (without a dog)	57	49	33
Dog walking	30	30	51
Taking children to play	28	27	18
Nature watching	21	30	23
Picnicking	17	27	12
Cycling	13	13	5
Photography	11	11	8
Seeing something in the wood	5	10	7
Jogging	6	6	6
Mountain biking	6	6	2
Attend cultural event or activity	2	3	2
Horse riding	3	2	1
Orienteering	2	2	1
Conservation activity	1	1	3
Fishing	0	1	1

Source: F4P Omnibus Surveys 2006 and 2007 (TNS, 2006a and 2007)

INDICATOR 12: NON-MARKET VALUE OF VISITS TO FORESTS

A tentative range of estimates for the recreational value of forests in Scotland can be made by transferring existing willingness to pay (WTP) values derived elsewhere for forest recreation. The estimate can be refined further by recognising that different sub-sets of recreational users will have different values for forest recreation, and aggregating values over these sub-markets. CJC Consulting (2006) followed this approach. They differentiated between values for different woodland based activities (walking dogs, other walking, cycling, horse riding, and nature/other) by transferring WTP values for visits to FC woodlands derived from Crabtree *et al.* (2001), Scarpa (2003) and Christie *et al.* (2006), giving estimates of £47m – £89m. On examination, it was decided that some of the values, in particular for specialist activities such as cycling, could not be applied across all FC woodlands in Scotland, and that a more robust estimate would be obtained by using WTP values for general recreation in FC woodlands provided by Scarpa (2003). Scarpa derived a mean maximum WTP of £1.66 per trip for all trips to FC woodland (£1.91 in 2007/08 prices). This value was separated into short trips (subset with round trips under 10 miles) and longer trips, giving values of £0.90 and £1.80 respectively, or £1.03 and £2.08 in 2007/08 prices.

To derive a range of values for woodland recreation in Scotland the calculation uses different WTP values for visits to FC and non-FC woodlands. Scarpa's value per trip for all trips to FC woodlands (£1.91 in 2007/08 prices) is used for all trips to FC woodlands. His value for short trips (£1.03 in 2007/08 prices) is used for all trips to non-FC woodlands, because these trips are assumed to include a greater proportion of short visits to local woodlands with a correspondingly lower value per visit.

To derive a lower estimate for woodland recreation, the figure of 37.2 million visits to woodlands is used, derived from the F4P Omnibus Survey 2007 (see Table 31). Of these visits, 6.2 million are assumed to be to FC woodlands (from the All Forests Survey, see discussion above) and therefore 31.0 million are to non-FC woodlands. By applying the WTP values given above, the lower estimate becomes £11.8 million for FC woodlands (6.2 *1.91), and £31.9 million for non-FC woodlands (31.0*1.03), giving a total of £43.7 million.

To derive an upper estimate, the figure of 68.0 million visits to woodlands is used, derived from the F4P Omnibus Survey 2006 (see Table 31). Using the same figure of 6.2 million for the share of visits to FC woodlands, then the number of visits to non-FC woodlands is 61.8 million. By applying the WTP values given above, the estimate for woodland recreation remains at £11.8 million for FC woodlands, and becomes £63.7 million for non-FC woodlands (61.8*1.03) giving a total of £75.5 million (see Table 31).

Table 31. The recreational value of Scottish forests and woodland

Ownership	Number of Scottish adult visits (m)		WTP per visit (£)	Aggregate value (£m)	
	Lower estimate	Upper estimate		Lower estimate	Upper estimate
FC	6.2	6.2	1.91	11.8	11.8
Non-FC	31.0	61.8	1.03	31.9	63.7
Total	37.2	68.0		43.7	75.5

To conclude, the value of woodland recreation in Scotland to the Scottish adult population is tentatively estimated to be between £44 million and £76 million. Clearly these results should be interpreted with caution. As discussed above, some of the variation in total number of visits between surveys remains unexplained, in particular for non-FC woodlands. If a higher estimate is used, then the value of recreation in non-FC woodlands will become proportionately higher. Similarly, if a higher share of visits to FC sites is assumed, then the upper estimate increases. Also it was decided not to disaggregate values for different woodland-based activities, some of which are likely to be valued much higher than £1.91. Christie *et al.* (2006) derive much higher values for activities such as cycling and horse riding, but these values were derived from a study of prime recreational sites with well-developed facilities. Also, the values adopted from Scarpa (2003) for FC sites are conservative; the highest value Scarpa provides is £2.78, £3.20 in 2007/08 prices. If these higher values were used, perhaps for trips where the main purpose was to visit woodland, then the higher estimate would increase.

The values for recreation given here are for individual adult visits. The valuation of visits by children is a relatively untouched area of research, and has not been attempted as part of this study. However, there is a possibility that Scarpa's values implicitly include WTP for accompanied children. Finally, little work has been done on the value of recreation for non-FC sites, which is likely to vary considerably for different sites, users and activities. It was assumed that £1.03 provides a reasonable estimate for the average value per visit, but it is expected that further research would provide more accurate estimates.

INDICATOR 13: NUMBER AND PURPOSE OF FOREST-RELATED PUBLIC EVENTS

The F4P Survey of Activities included questions to estimate the number of forest-related public events, levels of participation, number of partner agencies who helped to organise the event, and the primary and secondary purpose of the event according to the same ten categories used to separate total time spent working and volunteering in forest-related work

(see Annex 3 for definitions). These additional questions were only asked of FCS Forest Districts and Conservancies, partly to minimise the time burden on recipients, but also to avoid double counting since public events are typically organised with one or more other agencies. The results give an insight into the scale and scope of forest-related public events in Scotland, and are summarised below.⁸⁷ Results for specific thematic activities, such as 'culture' are also presented and discussed in the relevant sub-sections.

In total, FCS Districts and Conservancies organised 1,517 public events in the 12 months prior to the Survey in August 2007. It is assumed that an insignificant number of events were organised by other parts of the FC in Scotland. The number and percentage of events for each category of purpose is given in Table 32.⁸⁸ This indicates that 'woodland management' was the most common primary purpose, followed closely by 'formal education' and 'informal learning'.

Table 32. Primary and secondary purpose of FCS public events

Category	Primary purpose		Secondary purpose	
	Total events	Percentage	Total events	Percentage
Organisational support	2	0	10	1
Woodland management	352	23	82	5
Harvesting and processing	5	0	6	0
Biodiversity and wildlife	63	4	161	11
Recreation and access	226	15	149	10
Formal education	325	21	40	3
Informal learning	239	16	188	12
Health and well-being	137	9	203	13
Cultural activities	51	3	27	2
Public involvement	117	8	90	6
No event recorded	0	0	561	37
Total	1,517	100	1,512⁸⁹	100

Source: F4P Survey of Activities (2007)

The survey asked respondents to provide an estimate of the level of attendance for each event by selecting one of the following frequency classes: '1-10 people', '11-50 people', '51-100 people', '101-500 people', and 'more than 500 people'. These were assumed to represent, respectively: 5 people, 30 people, 75 people, 300 people, and 750 people. Using these assumptions the numbers and percentage of participants in all events for each type of primary purpose, and total number of participants, is given in Table 33. The figures are very sensitive to the assumptions used for each frequency class, especially for 'more than 500 people', where a conservative figure of 750 is used.⁹⁰ In total, the number of participants in FC events during the 12 months prior to the survey is estimated to be 133,880 people.

⁸⁷ There is the possibility of double counting if an event was organised by overlapping Forest Districts and Conservancies, and respondents from both units believed that they were the lead agency. However the incidence of this problem is considered to be low.

⁸⁸ The list of ten purposes was designed to be identical to the list used to separate time spent working and volunteering on social forestry and 'other' activities (see Table 2 and Indicator 5).

⁸⁹ There were 5 missing values.

⁹⁰ Rather than using mid-points for the frequency classes, it would be possible to model the frequency distribution to derive more accurate values. However, the increase in accuracy would probably be insignificant when compared with the error associated with the 'more than 500 people' class, which does not have a range associated with it.

Comparing Table 32 with Table 33 indicates that the most common type of event defined by primary purpose is 'woodland management' representing 23% of all events. But this ranking is not reflected in the level of attendance. 'Woodland management' only accounts for 5% of all participants, which suggests that FCS organises a large number of public events to relating to woodland management, but only a few people attend each event. In contrast, the type of event with the greatest total number of participants was 'formal education with 32% of all participants, although this category only comprised 3% of events. This may be explained by the likelihood that the majority of formal education events involve large numbers of children.

Table 33. Number and percentage of participants in FCS public events in the previous 12 months, by primary purpose

Type of event (primary purpose)	Number of events ⁹¹	Numbers of people attending	Percentage of people attending
Organisational support	2(2)	-	-
Woodland management	352	6,750	5
Harvesting and processing	5	2,355	2
Biodiversity and wildlife	63(3)	6,055	5
Recreation and access	226(54)	27,705	21
Formal education	325	42,245	32
Informal learning	239(3)	16,365	12
Health and well-being	137(4)	17,845	13
Cultural activities	51	4,900	4
Public involvement	117	9,660	7
Total	1,517	133,880	100

Source: F4P Survey of Activities (2007)

The Survey results also indicate that 35% of events were organised solely by FCS, while 65% involved one or more partners. Of those events that only took place once in each District or Conservancy in the previous 12 months, 90% of them were organised by four or fewer other partners. This proportion is only indicative of all FCS events, because it is not possible to use the data for multiple events (e.g. regular visits from local primary schools) due to the likelihood of double counting of partners.

INDICATOR 14: PUBLIC PERCEPTIONS OF FOREST-BASED RECREATION AND ACCESSIBILITY

The Scottish Public Opinion of Forestry Survey 2007 estimated that 41% of the Scottish adult population agree that a good reason to support Scottish forestry is to make woods more accessible to all in the community. In the same survey 57% gave positive responses when asked to rate the provision of woodland recreation opportunities in Scotland. When asked the same question for their local area 42% gave positive responses.

⁹¹ Number of missing values is shown in brackets.

Local woodland

It follows that the level of woodland use by the Scottish population is influenced by the proximity of woodland to people's homes, and this was shown to be the case in the F4P Omnibus Survey 2006. The Scottish adults who were surveyed were asked whether they had woodland near to where they lived (within a 10 minute walk). 72% said they did have local woodland nearby and 27% did not. Those who had visited forests in the previous 12 months were more likely to have local woods near to them than those who had not (76% as opposed to 67%). The DE social group were less likely to have local woodlands (61%) near to them than the other groups (AB 76%, C1 75%, C2 80%).

The Woodland Trust 'Space for People' research in 2004/05 estimated that only 15% of the Scottish population have access to woodland within 500m of their homes.⁹² However, the Scottish Forestry Strategy Implementation Plan states that this had increased to 23% by 2006/07 (FCS, 2008). One reason for the large difference with the F4P Omnibus Survey result of 72% is likely to be the narrower definition of 'woodland' used by the Woodland Trust, which was restricted to permissively accessible woodland of 2 ha or more that can be used by the public for recreational purposes, and excludes for example woodlands that are served only by public rights of way.

Safety and accessibility

Apart from physical accessibility of woodlands, another reason that affects woodland use is individual perceptions of safety. A recent report on the barriers to accessing woodlands in Scotland for health and well-being highlighted that negative perceptions about safety were an important issue, particularly for women and those living in deprived areas where there may also be evidence of anti-social behaviour in local woodlands such as dumping of litter, vandalism or drug use (Weldon *et al.*, 2007). Concern about safety did not necessarily mean that people did not use woodlands, but that they were more cautious, and only visited them at particular times of the day when they knew others were around. This point helps to explain why some of the quantitative evidence for perceptions of safety in woodlands can appear contradictory, with responses appearing to be dependent on the precise questions that are being asked, as illustrated below.

As part of the F4P Omnibus Survey 2006 those Scottish adults who had woodland near to where they lived (i.e. those 72% of the Scottish adult population mentioned above) were asked whether they felt safe visiting them. 74% said yes and 22% said no. There was a gender difference in the results as might be expected from previous research which suggests that some women feel more vulnerable in woodlands, particularly if they are on their own (Burgess, 1995; O'Brien, 2004; Weldon *et al.*, 2007). In this survey 33% of women with woods nearby said that they did not feel safe visiting them while for men the proportion was 12% (see Figure 10). This evidence is broadly comparable with data from the Greenspace Scotland 2007 Omnibus Survey, which concluded that 10% of respondents disagreed either slightly or strongly with the statement 'my local greenspace is a safe place for physical activity', while 56% strongly agreed (Greenspace Scotland, 2007).

⁹² See: www.treeforall.org.uk/AboutTreeForAll/WhyTreeForAll/Science/spaceforpeople.htm

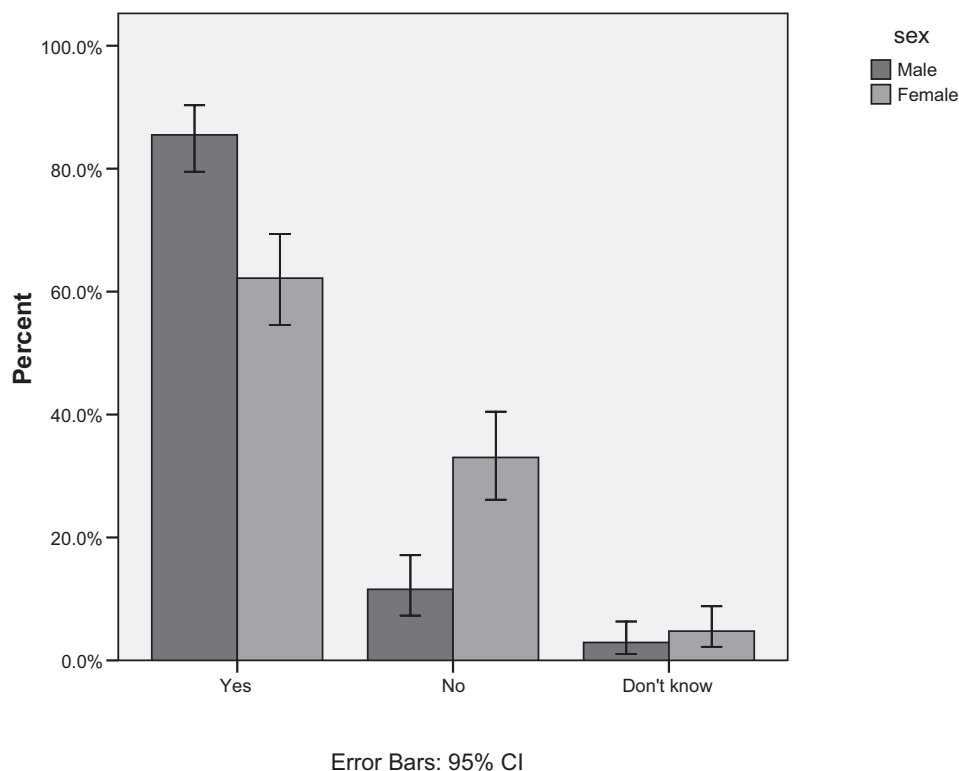


Figure 10. Percentage of respondents who feel safe visiting the woods near to them, by gender (Source: F4P Omnibus Survey 2006)

In the F4P Omnibus Survey 2006, black and minority ethnic groups with woods nearby were also less likely than other groups to feel safe (50%). Previous surveys and qualitative research have suggested that black and minority ethnic (BME) groups do not use woodlands and the countryside in numbers proportionate to their numbers in society (Edwards and Weldon, 2006; Countryside Agency, 2004; OPENspace, 2006). The F4P Omnibus Survey results for 2006 and 2007 indicate lower percentages of people from BME groups visiting woodland than for other groups, although due to the low sample size these differences are not statistically significant. A telephone survey for the Department of Transport and Local Government Regions (2002) also found that non-European ethnic minorities were more likely to be non-users or infrequent users of urban greenspace together with people over 65 years of age, women, disabled people, and 12-19 year olds.

In contrast to the relatively high concerns with safety in local woodlands revealed in the F4P Omnibus Survey 2006, the Public Opinion of Forestry Survey 2007 (FC, 2007b) asked members of the Scottish adult population who had not visited woodland in the previous few years to identify the main reason for not visiting woodland from a list of ten options, and only 1% chose 'concerns that woods are not safe', compared to 36% who chose 'not interested in going', 23% who chose 'other personal mobility reasons' and 14% who chose 'don't have a car'. Since only one reason was selected by each respondent, the low figure of 1% who chose concerns about safety does not include respondents for whom safety was a significant but secondary factor influencing their use of woodland.

2.4 LEARNING AND EDUCATION

KEY FINDINGS

15% of the Scottish adult population, or members of their families, were estimated to have attended a forest-based organised learning activity or event in the previous 12 months.

24% of Scottish children were estimated to have visited woodland in the previous 12 months as part of a nursery or school trip. Each child made an average of 2.3 visits per year, which equates to a total of around 510,000 visits.

Forestry Commission Scotland works with an estimated 20% of schools in Scotland, through school trips to forests, ranger visits to schools, and Forest School initiatives.

An estimated 24% of the Scottish adult population, who had visited woodland in the previous 12 months, had followed an interpreted trail.

58% of the Scottish adult population were estimated to have recalled seeing or reading about at least one topic related to Scottish forests, woods or trees in the last 12 months. 13% of respondents had used the Internet and 14% had used a leaflet to find out something about woodlands. 22% had discussed something about woodlands with their family or friends.

An estimated 96% of the Scottish adult population agreed or strongly agreed that woodlands allow families to learn about nature. 95% agreed or strongly agreed that woodlands play an important role in children and young people's outdoor learning experience.

BACKGROUND

Forests in Scotland are an education and learning resource that contributes to individuals and to society in a variety of settings including within woodland, the classroom, and the home. The broad scope of this theme is reflected in the range of substantive topics and types of learning that are woodland-related, including learning about nature and society, and interactions between them; learning about oneself; learning through working with others; developing new skills and undertaking practical work. Two perspectives are highlighted as part of this theme, as follows:

- 1) Formal education is provided by a variety of organisations in Scotland, for example through school trips to woodlands, visits to schools by rangers, and Forest School and Forest Education Initiative (FEI) activities. Benefits are primarily focused on 3-18 year olds, but some adult education also takes place in woodland settings.
- 2) Informal learning takes place in a woodland setting through organised trips including guided walks and interpretation, while printed materials and web-based information contribute to learning outside the woodland itself. It can be a significant part of lifelong learning, and includes individuals' use of woodlands and what they learn for themselves, as well as what they learn or is passed on to them from family and friends.

According to a report for the National Foundation for Education Research, learning outdoors can have a range of positive impacts:

- Cognitive impacts – gaining knowledge and understanding, academic outcomes
- Affective impacts – related to attitudes, values and beliefs e.g. gaining a sense of wonder or respect for nature
- Interpersonal/social impacts – improving communication skills, improving leadership expertise
- Physical/behavioural impacts – improving physical fitness, improving fine and gross motor skills, personal behaviour and social actions (Dillon *et al.*, 2005: 22)

A recent review of wild adventure space use by young people (Travlou, 2006) also identified a range of physical, educational and social benefits of outdoor play and adventure in natural settings (see also Ward Thompson *et al.*, 2006). Given these benefits, there appears to be a growing concern that children and young people are losing contact with the natural environment (Thomas and Thompson, 2004; O'Brien and Weldon, 2007). This is perceived to be due to a number of factors, including increasing time spent on indoor activities such as computer use, watching television, and a range of organised activities that are built into many children's spare time. In addition, many parents and teachers are becoming increasingly concerned about children's safety when outdoors. The effects of a more sedentary lifestyle are likely to be long-lasting in terms of health and well-being, as discussed under sub-section 2.5. Recent research in Scotland found that the single most important factor influencing use of woodland by adults was whether they had visited woodlands when they were young (Ward Thompson *et al.*, 2004; see also O'Brien, 2004).

Perhaps in response to these concerns, there is evidence of strong public and political support for outdoor education including forest-based education and learning. The Scottish Government has recognised the importance of learning outdoors. Scotland's education curriculum, 'A Curriculum for Excellence', produced in 2004, has important and positive implications for outdoor education (Scottish Executive, 2004b, 2006a). Part of the Curriculum for Excellence focuses on active learning outdoors, which is recognised by the Scottish Government to provide motivating opportunities for learning in all aspects of the curriculum: "The sights, sounds and smells of the outdoors, the closeness to nature, the excitement most children feel, the wonder and curiosity all serve to enhance and stimulate learning" (Scottish Government, 2007a).

Key examples of how forest-based formal education and informal learning are delivered in Scotland are outlined below.

Formal education: Forest School

Forest School has been defined by the Forest School England network as: "an inspirational process that offers children, young people and adults regular opportunities to achieve, and develop confidence and self-esteem through hands-on learning experiences in a woodland environment" (Murray and O'Brien, 2005).⁹³ Several aspects to Forest School differentiate it from other outdoor education activities, which emphasise its particular benefits as a learning and education opportunity for children (O'Brien and Murray, 2006). Broadly these features can be described as follows:

⁹³ Many Forest School projects are linked to the Forest Education Initiative, which was set up in 1992 as a partnership between several countryside service agencies to increase the understanding of young people of the environmental, social and economic potential of trees, woodlands and forests (see www.foresteducation.org/index.php).

- The use of a woodland (and therefore 'wild') setting
- A high adult-to-pupil ratio
- Learning can be linked to the national curriculum
- The freedom to explore using multiple senses
- Regular contact for the children over a significant period of time

To date, research into outdoor learning has focused on the personal and social development attainment of children's outdoor learning experiences. Thus, a recent evaluation by Borradaile (2006) of Forest School in Scotland concluded that it raises self-esteem, self-respect, and confidence of the children who participate, and, in turn, effects improved attitudes towards others and the environment. The impact of outdoor learning on pupils' academic attainment has not been specifically explored, and one recommendation for future research would be longitudinal studies that seek to assess attainment, including academic attainment of Forest School participants.

Informal learning: public events

Many forest-related agencies in Scotland offer programmes of public events, often in woodland settings, and, while there are often several reasons for organising each event, many have an informal learning or awareness-raising component. The diverse range of events and activities include bird-watching, learning about modern or traditional forest management, bats, making broomsticks, tree identification, and rambling with a ranger to learn more about forests or deer watching. Some events have a formal education role by providing venues for Forest School and through other partnerships with local educational institutions. The numbers and purposes of events organised by FCS are analysed in the 'recreation and accessibility' theme; numbers of events which had education and/or learning as the main purpose are given below.

Volunteers who carry out work in woodlands for a variety of organisations can also learn new skills and improve their understanding of the environment. Levels of volunteering are assessed under the 'employment and volunteering' theme. People who participate in 'friends' groups and community woodland groups may also learn informally in a variety of ways. Levels of participation in such groups are given under the 'community capacity' theme.

INDICATOR 15: PERCENTAGE OF THE POPULATION INVOLVED IN ORGANISED FOREST-BASED LEARNING ACTIVITIES

Estimates for participation in organised events that provide formal education and informal learning are given below, drawn from the two F4P Omnibus Surveys and the F4P Survey of Activities. Supporting evidence is provided by qualitative evaluations of organised activities.

The Scottish Public Opinion of Forestry Survey 2007 estimated that 15% of the Scottish adult population, or members of their families, had attended a forest-based organised learning activity or event in the previous 12 months. Of those 15%, 9% were referring to a school trip, and 6% were referring to a guided walk or talk. The same question was asked as part of the F4P Omnibus Survey 2006, and again 15% of the Scottish adult population, or members of their families, had attended such an activity or event. However, of those 15%, 11% were referring to school trips, 3% were referring to a Forest Education Initiative event, and 1% to a Forest School activity. All of these figures are higher than those derived from the equivalent survey in 2005, which found that 10% of respondents, or members of their families, had

attended an organised learning activity and, of those, 5% had been on a school trip and 5% had been on a guided walk or talk. From these data it is not possible to determine a clear trend in the level of participation in organised forest-based learning activities.

The F4P Omnibus Survey 2007 sought to go further than the previous surveys mentioned above and provide a figure for the total number of visits to woodlands in a 12 month period by children under 16 as part of organised nursery and school trips. Of the respondents to the Survey in 2007, 31% had children under 16 years of age living in their household. These were asked whether their child or children had made any visits to Scottish woodlands in the previous 12 months as part of a nursery or school trip. Responses were obtained for each child up to a total of three children in each household. From the data, an estimate of 24% can be derived for the proportion of children who had made such a trip. Of these children, 43% had made just one visit. However, each child made an average of 2.3 visits per year, which equates to a total of 510,000 visits as part of nursery or school trips during the period covered by the Survey. There was little difference in percentages between socio-economic groups, as might be expected for children's visits made as part of formal education. To put these estimates in context, in 2007 the total number of pupils in publicly funded schools in Scotland was 692,000 (Scottish Government, 2008).

Other surveys provide additional data to support this indicator. A survey carried out recently by FCS concluded that they worked with 569 schools in Scotland during 2007/08 (Sally York *pers. com.*) which represents 21% of the total number of primary, secondary and special schools in Scotland. Similarly, in 2006, O'Brien carried out a questionnaire survey of FCS Forest Districts and Conservancies to estimate levels of formal education activity for 3-18 year olds undertaken by FCS. The survey concluded that there were 560 visits made during the year covered by the survey (see Table 34).

Table 34. Number of formal educational trips to FCS forests

Type of school	Annual number of school trips made to FCS forests
Nursery	73
Primary	370
Secondary	79
Special needs	38
Total	560

Source: O'Brien (2006)

Assuming that there were 20 children on each trip, the total annual number of visits by children would be around 11,200. The figures are likely to be under-estimates because respondents may not have recalled all visits to their respective District or Conservancy. Also it should be stressed that the figures only cover the public forest estate.

A number of education progress indicators were also identified and data collected for a six-month period for the Woods for Learning 2005/2006 annual report by FCS. The data collected is shown in Table 35. It suggests that 8,095 visits were made to woodlands by pupils as part of formal educational activities between June 2005 and March 2006 (FCS, 2007a).

Table 35. FCS 'Woods for Learning' education progress indicators

Indicator	June 2005 – March 2006
Total number of pupils on school visits	8,095
Number of vocational pupils (worked with on course projects)	101
Number of teachers (worked with on placements)	157
Number of children with additional support for learning needs	286
Number of FEI funded projects	9
Number of FEI Cluster groups	12
Number of Forest Schools	20
Number of Forest School leaders in training	112

Source: FCS (2007a)

Additional data on 'formal education' and 'informal learning' events organised by FCS are available from the F4P Survey of Activities which was carried out in 2007, as reported under the 'recreation and accessibility' theme. Out of the 1517 events that were organised by FCS in the 12 months prior to the Survey, 325 events (21%) were considered to have had 'formal education' as the primary purpose, while 239 events (16%) were considered to have had 'informal learning' as the primary purpose. The Survey also estimated the number of people who visited each event, which allows an estimate to be made for the total number of visits for events with different primary purposes. However, since it is likely that some people will have attended more than one event, it is not possible to use these data to estimate the total number of people who attended those events. Formal education events involved a total of 42,245 visits (32% of all visits to organised events), while informal learning events involved a total of 16,365 visits (12%). Thus, taken together, education and learning accounts for 44% of all visits made as part of public events organised by FCS.

Additional data on informal learning was obtained from the F4P Omnibus Survey 2006, which concluded that 6% of the Scottish adult population, who had visited a woodland in the previous 12 months, had been on a guided walk on at least one of those visits.

The same Survey estimated that 24% of those respondents who had visited woods in the previous 12 months had followed an interpreted trail. There was a significant gender difference, with men being more likely to have been on an interpreted trail (30%) than women (19%). Those in the higher socio-economic groups were also more likely to have been on an interpreted trail (AB 27%, C1 27%) than those in the lower groups (C2 21% and DE 19%). Those in the 35-54 year old age group (28%) were more likely to have been on an interpreted trail than those in the 16-34 age group (23%) or the 55+ age group (19%).

Finally it is relevant to highlight that, while the numbers of children (and adults) who participate in organised forest-based learning and education activities may be a small proportion of the Scottish population, the benefits that some individuals derive may be considerable due to the large number of visits that they make and the intensity of the experience, for example for children who participate in Forest School (Murray, 2003; Murray and O'Brien, 2005). Table 36, taken from O'Brien and Murray (2007), highlights six of the key themes that emerged from research into the impacts of Forest School in England. Related research in Scotland broadly supports these findings (Borradaile, 2006).

Table 36: The impacts of Forest School on participating children

1. Confidence	2. Social skills	3. Language and communication
Characterised by the self-confidence and self-belief that comes from children having the freedom and the time and space to learn, grow and demonstrate their independence.	Characterised by an increased awareness of the consequences of actions on other people (peers and adults). The acquired ability to undertake activities with others either by sharing tools and tasks, or by taking part in co-operative play.	Characterised by the development of more sophisticated uses of both written and spoken language (vocabulary and syntax) that is prompted by the visual and other sensory experiences of a child. At the same time these experiences can stimulate and inspire conversation among children who are otherwise reluctant to engage in dialogue with peers and adults.
4. Motivation and concentration	5. Physical skills	6. Knowledge and understanding
Characterised by keenness to participate in exploratory, learning and play activities. Also an ability to focus on specific tasks and to concentrate for extended periods of time. In conversation at school or at home they display a positive attitude towards Forest School in particular, and towards learning in general.	Characterised by the development of physical stamina and gross motor skills – the physical skills and co-ordination allowing the free and easy movement around the Forest School site. As well as the development of fine motor skills, the effective use of tools and the ability to make structures and objects, e.g. shelters, dens or creative art projects.	Characterised by a respect for the environment and an interest in their natural surroundings: making observations and insights into natural phenomena such as seasonal change and the ability to identify different species of flora and fauna. This can be reflected in improved academic attainment.

Source: O'Brien and Murray (2007)

INDICATOR 16: PERCENTAGE OF THE POPULATION WHO HAVE SEEN OR READ ABOUT SCOTTISH FORESTS, WOODLANDS AND TREES IN THE MEDIA

Apart from direct contact with woodlands, one of the ways in which people can gain an understanding or awareness about issues relating to woodlands and trees is by seeing or reading about them in the media. The range of forest-related stories or issues that are covered by the media includes public rights of access, the loss of ancient woodlands, and the creation of new woodlands.

Respondents were asked in the Scotland Public Opinion of Forestry Surveys 2003, 2005 and 2007 whether they had seen or read about Scottish forests, woods or trees on the television, radio or in the newspapers in the previous twelve months. The results are given in Table 37. 58% of respondents in the 2007 Survey recalled seeing or reading about at least one of the topics listed. This is considerably higher than in 2003 or 2005. It is not clear in the 2005 Survey why the percentage of people recalling at least one topic was so low (26%) compared with the 2003 (49%) and 2007 (58%) surveys. Part of the explanation may be the changing level of promotion of forest-related issues and events by forest-related organisations. For example, 2007 was the Year of Highland Culture in Scotland and FCS, with a range of partners, ran a number of flagship events to celebrate this. One example of this was the 'Green Machine' an interpretative trailer that visited schools and community events around the country promoting natural heritage as an asset to enjoy. This initiative was a joint venture

with Scottish Natural Heritage (FCS, 2007c). Climate change has had an increasingly high profile in the media and related to this have been reports about changes in biodiversity and debates about conservation issues. The higher percentage (35%) of respondents who had heard about public rights of access in 2007 could potentially be related to the new Scottish Outdoor Access code which clarifies details of the 2003 Land Reform Scotland Act.

Respondents in the Scotland Public Opinion Survey 2007 who had visited forests in the previous few years were more likely than those who had not visited to have seen or heard about all of the topics listed. The top five topics that people had seen or read about were: 1) public rights of access, 2) tree planting, 3) forests helping to tackle climate change, 4) birds and animals in woods and 5) forests as places to visit. For the topics of tree planting and climate change the AB and C1 social groups were more likely to have seen or read about them than the C2 and DE groups (31% if AB and C1, and 22% of C2 and DE for the topic of tree planting, and 32% of AB and C1, and 19% of C2 and DE for climate change).

Table 37. Percentage of adult population who had seen or read about Scottish forests, woods or trees in the previous 12 months

Topics recalled	2003	2005	2007
Public rights of access to woodland	19	15	35
Tree planting	19	9	27
Birds and other animals in woodland	19	8	23
Forest and woodlands as places to visit	14	6	22
Protests about roads or other developments on woodland	13	6	19
Loss of ancient or native woodland	9	5	13
Flowers and other plants in woodland	8	4	13
Restoration of ancient or native woodland	8	4	13
Selling public woodland	8	4	-
Community woodland	-	4	13
Woods in and around towns, new local woods or improved local access	-	4	11
Creation of new native woodland	6	4	11
Tree pests and diseases	5	3	7
Wood for fuel / short rotation coppice	4	2	8
Labelling / certification of wood products	2	1	6
Timber transport	4	0	-
Forests and woodlands helping to tackle climate change	-	-	25
Percentage of adult population who recalled at least one topic	49	26	58

Source: FC (2007b). Base: 2003 (1,018), 2005 (1,009), 2007 (1,007)

The F4P Omnibus Survey 2006 also asked respondents to recall whether and how they had found out something about woods. The results indicated that 13% of the Scottish adult population had used the internet, and 14% had used a leaflet, to find out something about woodlands, while 22% had discussed something about woodlands with family and friends in the previous 12 months. Members of the AB socio-economic group were twice as likely as members of the DE group to have used the internet or a leaflet to find out something about woods (see Figure 11).

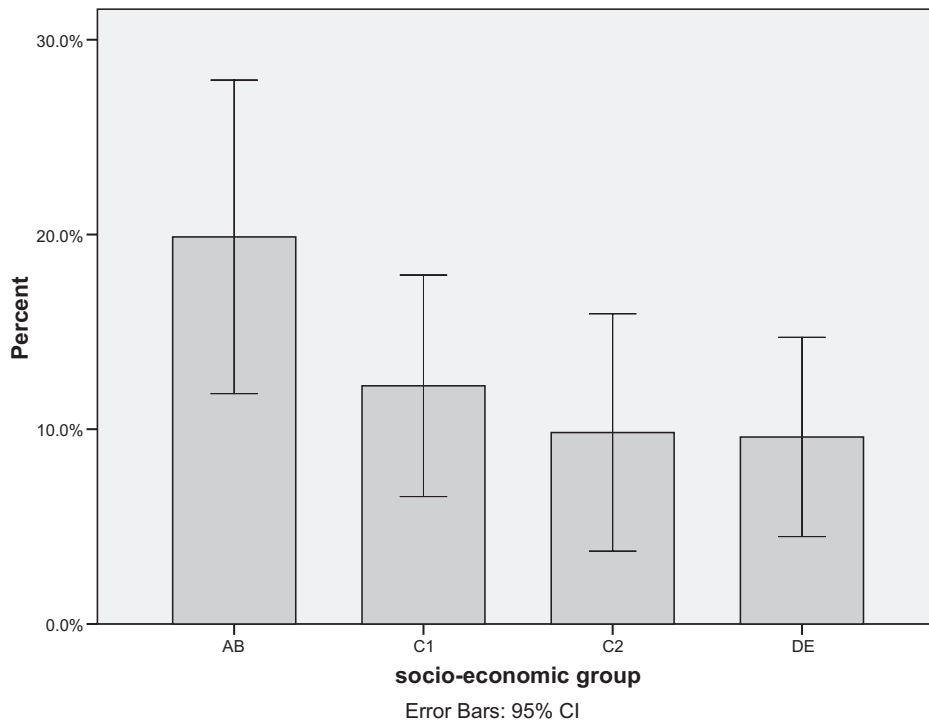


Figure 11. Percentage of respondents who had used the internet to find out about something about a woodland, by socio-economic group

The 16-34 and 35-54 year old age group were more likely to have used the internet, a leaflet, or discussed woods than the 55+ age group. Men were more likely to have used the internet than women. However women were more likely to have used a leaflet than men. Internet usage decreased with increasing age class. Of those who had used the internet, a leaflet, or talked to family or friends about woods, 81% had visited woodlands in the previous twelve months while 19% had not. 53% of those who had visited woodlands, and 15% of those who had not visited, had done one of the above activities, which suggests that those who visit woodlands are more likely to seek out information about them or discuss them with others than those who do not visit.

INDICATOR 17: PUBLIC PERCEPTIONS OF THE LEARNING AND EDUCATION BENEFITS OF FORESTS

The F4P Omnibus Survey 2006 examined public perceptions of the learning and education benefits of forests in Scotland. 96% of the Scottish adult population agreed or strongly agreed with the statement that woodlands allow families to learn about nature. 41% of those who had visited woods in the previous 12 months strongly agreed with the statement as opposed to 27% of those who had not visited, which suggests that forest users are more likely to value the learning and education benefits provided by forests than non-users (see Figure 12).

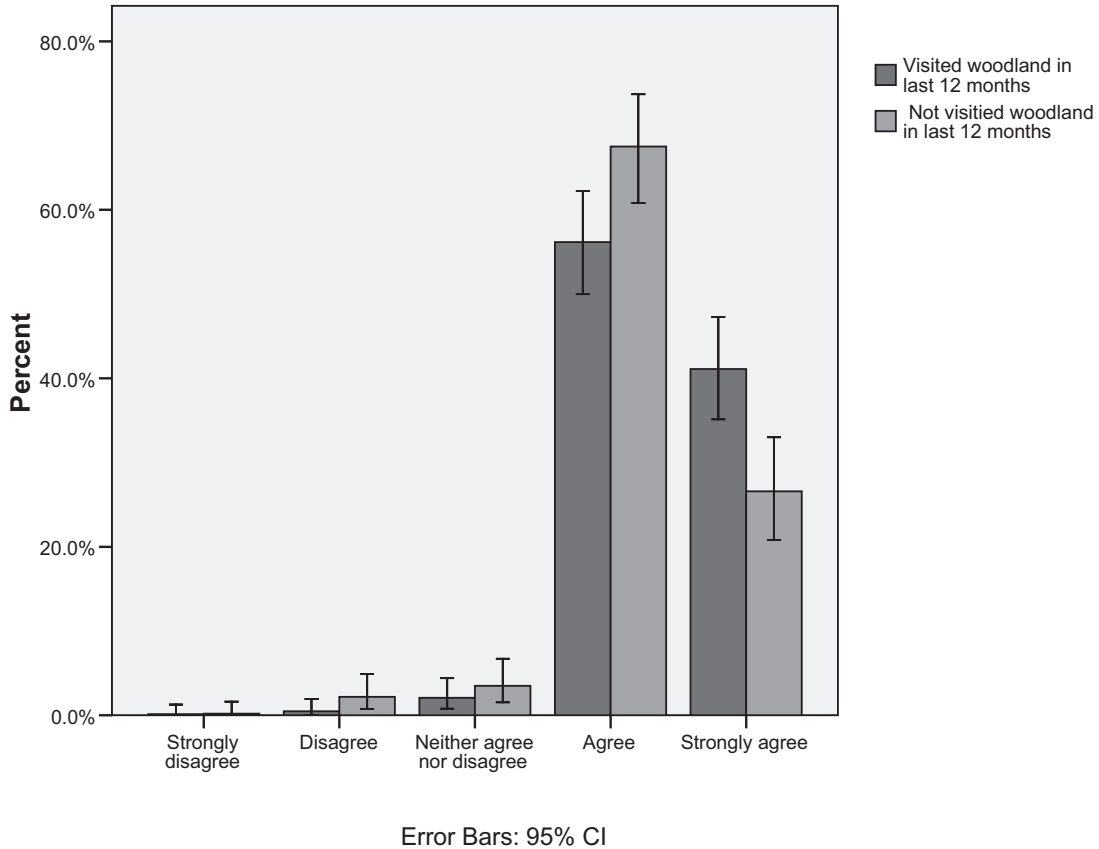


Figure 12. Percentage of respondents who perceived woodlands to be places that allow families to learn about nature, by those who had or had not visited woodland in the previous 12 months

Respondents were asked whether woodlands play an important role in children’s and young people’s outdoor learning experience and 95% agreed or strongly agreed with this statement. Women were significantly more likely than men to strongly agree, although there were similar responses across age groups and socio-economic groups. These findings are similar to those from the UK Public Opinion of Forestry Survey 2007, as shown in Table 38.

Table 38. Percentages of respondents who agreed or strongly agreed with two statements on the benefits of woodland-based learning

Statement	Percentage of adult population who agreed or strongly agreed		
	F4P Omnibus Survey 2006	UK POF Survey 2007	UK POF Survey 2007: Scottish responses
“Woodlands allow families to learn about nature”	96	94	93
“Woodlands play an important role in children’s and young people’s outdoor learning experience”	95	93	95

Source: F4P Omnibus Survey 2006 (Base = 1,015), UK POF 2007 (Base = 4,000), Scottish respondents to UK POF 2007 (Base = 353)

Also of relevance, an Omnibus Survey commissioned by Greenspace Scotland in 2007 found that 89% of respondents strongly agreed that greenspaces are good places for children to play. Play has been shown to be an important part of children's social and cognitive development and an important way in which they learn about themselves, other people, society and nature.

2.5 HEALTH AND WELL-BEING

KEY FINDINGS

An estimated 5% of the Scottish adult population had attended an organised event in a wood that involved physical activity in the previous 12 months.

Around 40% of the Scottish adult population carry out the recommended minimum level of at least 30 minutes of moderate intensity exercise on at least five days a week. 2.5% are estimated to be exercising at this level in woodlands, and 2% are estimated to be exercising for at least 30 minutes on three or four days a week in woodlands.

9% of the public events organised by Forestry Commission Scotland between mid-2006 and mid-2007 were considered to have had 'health and well-being' as the primary purpose. 'Health and well-being' events involved 13% of all visits by the public to Forestry Commission Scotland events in that year.

An approximate estimate for the annual value of the physical and mental health benefits of Scottish woodlands is calculated to be between £10 million and £111 million at 2007/08 prices, depending upon the assumptions used. Further research is needed to refine these estimates.

An estimated 82% of the Scottish adult population agree or strongly agree that woodlands are places to reduce stress and anxiety, while an estimated 79% agree or strongly agree that woodlands are places to exercise and keep fit.

BACKGROUND

Scotland is near the top of international league tables for major diseases of the developed world such as coronary heart disease (CHD), cancer and stroke (FCS, 2007b). The Health Survey in Scotland 2003 found that only 44% of men and 33% of women aged 16-74 were meeting the minimum recommendation of exercising for at least 30 minutes on at least five days a week (Scottish Executive, 2005b). The same Survey estimated that 65% of men and 60% of women in Scotland were either overweight or obese, while another study (Scottish Executive, 2006b) estimated that 30% of girls and 35% of boys aged 2-15 years are either overweight or obese.

The importance of the 'health and well-being' theme to the Forestry for People project is supported by evidence that levels of public health are related to levels of physical activity undertaken by individuals, and to the socio-economic and environmental conditions of individuals and communities, and that outdoor settings in general, and woodlands in particular, can provide favourable environments to undertake physical activity that enhances both physical and mental health and well-being. These relationships are discussed briefly below. As with other themes, the indicators presented here seek to assess the 'gross' value of the impacts of woodlands on Scottish health and well-being, rather than the 'net' value that may be additional to alternative forms of land use (see sub-section 1.1).

The medical case has been made for the importance of physical activity in relation to physical health. According to the WHO (2002) physical inactivity is one of the main causes of death and disability in the developed world. Promoting physical activity is “a powerful means of preventing chronic diseases [for individuals] and for nations it can provide a cost effective way of improving public health across the population” (WHO, 2006). Similarly, according to the British Heart Foundation (2002), policies that create supportive environments for physical activity have the potential to save human lives, health care resources, and industry lost-production costs. It has been estimated that 9% of deaths from CHD could be avoided if people who are presently inactive become moderately active (British Heart Foundation, 2002; see also Parliamentary Office of Science and Technology, 2001).

Research has shown that walking is the most successful activity to promote to inactive people and promoting physical activity has been described as public health’s best buy (Morris, 1994). Research also shows that there is a beneficial link between exercise and mental health, and this is the case regardless of whether a person has a clinical condition.⁹⁴ However, estimates for the cost of mental health to the economy, and hence the benefits of prevention, vary due to inherent difficulties associated with the measurement of mental condition.

Regarding the impacts of socio-economic and environmental conditions, studies have demonstrated that poverty, unemployment, education, living and working conditions, families, friends, social support and physical environment can all significantly affect health (Mitchell-Banks, 2006). For many diseases the wealthy have a lower incidence rate than the poorest within a population. Regarding the role of outdoor settings as venues for physical activity, existing literature suggests that people tend to accumulate their physical activity in informal outdoor settings rather than in formal structured contexts (Physical Activity Task Force, 2003). It also reveals that maintenance of this activity is most likely in relatively unstructured natural circumstances, and does not necessarily require attendance at a formal facility (Hillsdon *et al.*, 1995). Some of this work is outlined in the briefing paper on woodlands and greenspace and the promotion of health and physical activity produced by the Physical Activity and Health Alliance (2007).

Meanwhile, a growing body of evidence suggests that trees and woodlands can have a role to play in improving people’s health and well-being. A range of reviews have brought together this work and various categories of benefits have been identified (Rhode and Kendle, 1994; Henwood, 2001; Tabbush and O’Brien, 2003; Bird, 2004; Pretty *et al.*, 2005; and O’Brien, 2005). The various benefits are increasingly cited in policy documents, for example the FCS ‘Woods for Health’ strategy outlines the benefits of using woods for health gain and provides illustrations of current activities (FCS, 2007b). Benefits tend to be separated into the following three types, although for many forest users all three are perceived to be inextricably linked:

Physical well-being: the ability to exercise in a pleasant environment, which may encourage higher levels of exercise.

Psychological well-being: stress reduction, mood improvement and restoration in natural environments. Research by Kaplan (2004) suggests that natural environments such as woodlands are particularly important as restorative environments through their

⁹⁴ The Scottish Government launched its National Programme for Improving Mental Health and Well-being in 2001 which aims to improve the mental health and well-being and quality of life of all living in Scotland (Well Scotland, 2008).

ability to provide opportunities for fascination, extent (opportunity for exploration), compatibility (fitting in with the needs of the person at that moment) and being away.

Social well-being: social capital generated as part of health intervention projects, such as walking schemes that motivate people to get involved and stay involved because they meet others and develop social networks.

In response to this broad evidence-base, promotion of physical activity has become increasingly prominent in Scotland over the last decade as a means to enhance public health. In 2003, the Scottish Executive produced a white paper on health, 'Partnership for Care' (Scottish Executive, 2003a) which stated that "Scotland's health is improving but remains poor compared to the rest of Europe, with an unacceptable health gap between the richest and the poorest communities". The paper called for an improvement to Scotland's health and a reduction in health inequalities within Scottish society. In the same year, a new Strategy for Physical Activity was produced (Scottish Executive, 2003b) which argued that: "As a nation Scotland is inactive, unfit and increasingly overweight" (Scottish Executive, 2003b: 6). Most recently, in 2005 the Deputy Minister for Health announced the development of the Environment and Health Strategic Framework to coordinate and direct action on the key environmental impacts on human health. Its goal is "the development of better systems to pursue environments consistently with, and promoting of, human health and well-being and a Scotland of equal opportunity" (Scottish Government, 2007b). This new approach recognises the many complex links between the environment and health, both positive and negative, and is discussed by Morris *et al.* (2006).

INDICATOR 18: PERCENTAGE OF POPULATION INVOLVED IN ORGANISED FOREST-BASED HEALTH ACTIVITIES

The F4P Omnibus Survey 2006 estimated levels of organised forest-based health activity and concluded that 5% of the Scottish adult population had attended an organised event in a wood that involved physical activity.⁹⁵ There was a small gender difference, with men being more likely to have done this (6%) than women (4%). The 55+ age group were significantly less likely to have attended an organised event involving physical activity (1%) than the 16-34 (7%) group. There were also small social group differences with the AB group (7%) and C1 group (7%) more likely to have been involved in an organised physical activity than the C2 (4%) or DE (2%) groups. There could be many reasons for these differences, including the levels of access to woodlands near to where people live.

The F4P Survey of Activities 2007 provided additional data on public events organised by FCS in the 12 months prior to the Survey for which 'health and well-being' was considered to have been the primary purpose, as reported under the 'recreation and accessibility' theme. Out of the 1,517 events that were organised by FCS in the 12 months prior to the Survey, 137 events (9%) were considered to have had 'health and well-being' as the primary purpose. The Survey also estimated the number of people who visited each event, which allows an estimate to be made for the total number of visits for events with different primary purposes. However, since it is likely that some people will have attended more than one event, it is not possible to use these data to estimate the total number of people who attended those events. Health and well-being events involved a total of 17,845 visits (13% of

⁹⁵ 'Organised' events means primarily those that are organised by an agency, such as FCS or a local authority, as opposed to informal events organised by individuals. Survey respondents were left to make their own interpretation of the meaning of 'organised' and it is possible that a small proportion will have included 'self-organised' events (e.g. running with friends or small group outings) in their responses.

all visits to organised events), which is less than a third of the number of visits to events with either 'formal education' or 'informal learning' as the primary purpose.

Although this indicator focuses on organised forest-based health activity this will probably account for a small percentage of people's activities related to health in woodland, since many individuals carry out a wide range of informal recreational pursuits as individuals or with friends and family, which provide mental, physical and social health and well-being benefits. To assess levels of physical exercise in woodlands the F4P Omnibus Survey 2006 asked respondents about overall levels of exercise, and levels of woodland-based exercise, as reported below.

The F4P Omnibus Survey 2006 asked respondents on how many days a week they undertook at least 30 minutes of moderate intensity physical exercise. Respondents were informed that 'physical activity' was defined as any activity that made breathing and heartbeat faster such as sport, recreation or domestic activities. Exercise on at least 5 days per week is the recommended amount of physical activity to maintain a healthy lifestyle and to gain health benefit. 40% of respondents said that they were carrying out the recommended 5 or more days per week. For women, 41% (+/- 6% at 95% CI) were exercising at least 5 days a week, which is higher than the 33% estimated by the Scottish Health Survey 2003 (Scottish Executive, 2005b). As might be expected, respondents in the 55+ age class did less exercise than those in younger age classes, although similar proportions of each age class were exercising 7 days a week.

Regarding exercise in woodlands, 2.5% of the Scottish adult population said that they carried out 5 or more days of exercise a week in woodlands. Note that these individuals may also have undertaken exercise in non-woodland locations. This figure is 6% of all respondents who said that they exercised at this recommended level in both woodland and non-woodland locations. It is used to estimate the economic impacts of forest-based health activities (Indicator 19), and is based upon the subset of respondents who said that they had visited woodlands several times per week in both summer and winter, and exercised in woodlands 5 or more times in an average week. In comparison, 2% of the Scottish adult population (who visited woodlands several times per week in both summer and winter) exercised in woodlands between 3 and 4 times in an average week.

INDICATOR 19: ECONOMIC IMPACTS OF FOREST-BASED HEALTH ACTIVITIES

There are no 'willingness to pay' estimates for the health benefits of woodlands as distinct from the recreational benefits of physical exercise in woodlands. Therefore the health benefits of physical exercise in woodlands in monetary terms are calculated in this report by the value society places on reducing preventable fatalities and on the money society saves by not incurring health care costs of those who become ill because of a lack of adequate physical exercise, i.e. mortality and morbidity avoided.

As described above, the F4P Omnibus Survey 2006 estimated that 2.5% of the Scottish adult population had visited woodlands several times per week in both summer and winter, and said that they had exercised 5 days per week or more in woodland. This means that 2.5% of the Scottish adult population can be said to undertake physical exercise in woodlands on a basis considered to be regular enough to improve or maintain their health, which can be estimated to be around 105,000 adults based upon the total Scottish adult population of 4,195,000 in mid-2006 (GROS, 2007). These individuals may also be undertaking exercise in non-woodland settings.

Avoided mortality

Using data on relative risk and calculations based upon the proportion of the population exhibiting that risk, the number of avoided deaths attributable to woodland recreation for the sedentary Scottish population (i.e. exercising less than one 30 minute session per week) is estimated to be 50 for Coronary Heart Disease (CHD), 13 for stroke, and 5 for colon cancer; or 68 in total.⁹⁶ The benefits of increased physical activity due to woodland for CHD, stroke and colon cancer increases the probability of immediate survival. Therefore according to CJC Consulting (2005b) the valuation is similar to the case for valuing mortality as a result of road accidents. If, following the method adopted in CJC Consulting (2006), each avoided death is valued at £1.5 million,⁹⁷ the annual value of avoided mortality due to physical exercise in Scottish woodlands would be about £99 million (at 2007/08 prices).⁹⁸ This is equivalent to a capitalised value (assuming a 3.5% discount rate) of £2,800 million at 2007/08 prices.

However, at present there is no consensus among health professionals on whether the health impacts are immediate or long-lasting. If the benefits of exercise are of a more immediate than of a long-lasting nature, the effects of reduced mortality would be concentrated in older age groups, especially individuals aged over 75 years, and the value of avoided death at £1.5 million would be too high, because the increase in life expectancy for that age group would be significantly lower than for the Scottish adult population as a whole. Furthermore, it is not known to what extent average life expectancy of those exercising in woodlands is increased compared to those who are sedentary. For these reasons, the above can be considered to constitute a 'high' estimate of the benefits.

A 'low' estimate can be derived by excluding avoided mortality benefits to those in the over-75 age group (who in any case are less likely to be undertaking the required level of exercise in woodlands), assuming that the health benefits of exercise are delayed rather than immediate, and that only a proportion of those currently meeting Department of Health guidelines would become sedentary if unable to exercise in woodlands. The estimates for avoided mortality based upon excluding over 75 year olds can be obtained by using the proportions of the total deaths averted in younger age groups from CJC (2005: Tables 3.1,

⁹⁶ The original estimates by CJC Consulting (2006) of number of avoided deaths attributable to woodland recreation for the sedentary Scottish population are based upon a figure derived from the F4P Omnibus Survey 2006 of 5% for the proportion of the Scottish adult population who carry out the recommended level of exercise in woodlands. The figure of 5% is likely to be an over-estimate, and 2.5% is used here instead, which is the proportion who exercised at the recommended level in woodlands and who had visited woodlands several times per week in both summer and winter. The relationship between the proportion of the population exercising and the associated avoided mortality benefits is assumed to be linear (Ken Willis, *pers. com.*)

⁹⁷ This estimate is taken from the Value of a Preventable Fatality of £1,312,260 in June 2003 from Department for Transport (2004) guidance on valuing the benefits of prevention of road accidents and casualties, reflatd to 2007/08 prices using the GDP deflator.

⁹⁸ CJC Consulting (2006: p.33 Footnote 45) reflatd to 2007/08 prices and based on 2.5% of the Scottish population rather than 5% (see previous footnote). The estimate of £1.5m is in line with the top range of the DEFRA figures from "Annex 2: Valuing the health benefits associated with reductions in air pollution: recommendations for valuation" at: www.defra.gov.uk/environment/airquality/publications/stratreview-analysis/annexes-icgb.pdf. The figures recommended here, per year of life gained, are £15,000 to £29,000 in 2004 prices. This makes (£29,000 x 40 years; see Table A2.7 on page 320 paragraph 51) £1.2 million for the Value of Statistical Life (VOSL). They further state on page 314, paragraph 31 that "...a consensus number of £1 million to £1.2 million emerges for the UK" when considering stated preferences studies.

The Value of Preventable Fatality (VPF) is estimated by assessing people's willingness to pay to avoid the risk of death or injury. The value of £1.3m was derived in the road accident context by the Department of Transport. Quality Adjusted Life Years (QALY) is another method used to measure years of life saved and the quality of life experienced in those years. The National Institute for Clinical Excellence use QALYs as a cost effectiveness measure to value the benefits from intervention through public expenditure. VPF has been used in this study rather than QALY to focus on the public benefits of a reduced probability of morbidity or mortality rather than the cost effectiveness of an intervention.

3.2 and 3.3, pp.24-25) of 34% for CHD, 19% for stroke, and 45% for colon cancer. This gives estimates for the number of avoided deaths attributable to woodland for those under 75 years old of 22 in total (17 for CHD, 3 for stroke, and 2 for colon cancer). While research is needed to determine to what extent benefits are delayed and to what extent those currently exercising in woodlands would become sedentary, here it is assumed that deaths are avoided five years after exercise is taken (rather than immediately) and that only 10% of those currently meeting Department of Health guidelines through exercise in woodlands would become sedentary.⁹⁹ Adopting these assumptions gives a 'low' estimate of the annual value of avoided mortality benefits due to physical exercise in Scottish woodlands of £2.7 million and a capitalised value of £77 million at 2007/08 prices (assuming a 3.5% discount rate as previously).

Reduced morbidity

The benefits of reduced morbidity are calculated using a similar approach to that given above. The number of avoided morbidity cases attributable to woodland recreation for those exercising on 5 or more days a week is estimated at 31 for CHD, 1 for stroke and 0.3 for colon cancer.¹⁰⁰ The benefits of reduced morbidity were calculated by CJC Consulting (2005) as £2,903 per CHD case avoided, £12,363 per stroke case avoided and £3,650 per colon cancer case avoided. These provide a 'high' estimate of the annual value of around £110,000 equivalent to a capitalised value of £3.2 million (at 2007/08 prices). A 'low' estimate is derived by excluding avoided morbidity benefits to those in the over-75 age group,¹⁰¹ assuming that the health benefits of exercise are delayed rather than immediate, and that only a proportion would reduce their physical activity to a level whereby they no longer obtained these benefits if unable to exercise in woodlands. Adopting similar assumptions to the avoided mortality benefits (i.e. that avoided morbidity benefits occur 5 years after exercise is taken and that only 10% of those currently obtaining these benefits would reduce their physical activity to a level that they were no longer obtained) gives a 'low' estimate of the annual value of avoided morbidity due to physical exercise in Scottish woodlands of around £5,800. This is equivalent to a capitalised value of £170,000 (at 2007/08 prices).

Aggregating the above mortality and morbidity estimates gives an annual value of between £2.7 million and £99 million, and a capitalised value of between £77 million and £2,800 million (at 2007/08 prices).

Most of the physical health benefits are for avoided mortality through the use of woods by people for physical exercise. This may be a conservative estimate by restricting benefits to those who undertake at least 30 minutes of physical exercise per week on 5 days or more in

⁹⁹ These assumptions are necessarily somewhat arbitrary in the absence of research, but are arguably no less so than assuming benefits are immediate and apply fully to all those exercising in woodlands at the recommended level. They are thought to provide a useful comparison with the higher estimates derived from following the approach adopted in CJC Consulting (2006).

¹⁰⁰ The original estimates by CJC Consulting (2006) of number of avoided morbidity cases attributable to woodland recreation for the Scottish population of 63 for CHD, 2 for stroke and 0.5 for colon cancer were based upon 5% of the Scottish adult population carrying out the recommended level of exercise in woodlands estimated from the F4P Omnibus Survey 2006. As with the avoided mortality estimates, 2.5% is used here instead, which is the proportion of those surveyed who exercised at the recommended level in woodlands and who had visited woodlands several times per week in both summer and winter.

¹⁰¹ The estimates by CJC Consulting (2006) of the annual avoided morbidity benefits attributable to woodland recreation for the Scottish population under 75 of £132,612 were also based upon 5% of the Scottish adult population carrying out the recommended level of exercise in woodlands estimated from the F4P Omnibus Survey 2006. Using 2.5% (the proportion of those surveyed who exercised at the recommended level in woodlands and who had visited woodlands several times per week in both summer and winter) instead of 5% halves the original benefit estimate.

woods.¹⁰² Ascribing similar health effects to a wider population group exercising on 3-4 days a week would effectively double the benefits from avoiding premature death by undertaking physical exercise in woodland. Similarly, assuming that people who undertake exercise for 30 minutes but for fewer than 5 days per week also receive health benefits in terms of avoided morbidity, then additional benefits in terms of increased cost savings from reduced illness would also be attributable to woodland.

Air pollution reduction

Trees can improve the health of the general population by improving air quality. Reduction in air pollution can increase a person's life-span, rather than reducing the likelihood of premature death. Trees in Scotland are estimated to capture 190 million metric tonnes of particulate matter of 10 micrometers or less in diameter (PM₁₀) found in the air, for example from vehicles, construction sites, and factories, that can be breathed in by people, and 2.5 million metric tonnes of sulphur dioxide. The capitalised benefits, according to CJC Consulting (2006: 39) for the impact of Scottish woodlands by reducing air pollution and improving health are between £122,000 and £7.4 million in 2007/08 prices, which is equivalent to an annual value of between £4,000 to £260,000. This is an extremely large range and reflects the continuing uncertainty and debate of the impact of air pollution reduction in improving individuals' health by only a potentially small amount many years into the future. This figure does not account for the benefits of single trees or woods of less than 2 ha and their contribution may be considerable especially in urban locations. A strategy of woodland expansion around and within urban areas may lead to a significant realisation of public health benefits compared to woodlands in rural areas of Scotland.

INDICATOR 20: IMPACTS OF FORESTS ON MENTAL WELL-BEING

Mental health problems are estimated to cost the UK from £25 - £77 billion per year through the cost of care, economic losses and premature death (Layard, 2004; ODPM, 2004). Evidence for Scotland suggests that the prevalence of depression and anxiety is about 1 in 10 for the population as a whole. The cost of mental illness in Scotland can be approximately estimated by calculating the number of people suffering from a mental illness multiplied by the economic cost to society per person mentally ill. The economic cost to society per mentally ill person in the UK is estimated to be £2,532 per year (Layard, 2004). The Scottish population was 5,116,900 in mid-2006 (GROS, 2007), while the percentage of people suffering from depression and anxiety was 11% in 2004/05 (Scottish Public Health Observatory, 2006). If it is assumed that the proportion of the population suffering from mental illness is the same in Scotland as the UK as a whole (16.4%), then 839,172 people in Scotland may be assumed to suffer from some form of mental illness. This suggests that the total economic cost to society of mental illness in Scotland to be in the region of £2,304 million in 2007/08 prices.

There are currently major gaps in knowledge that prevent an accurate and reliable appraisal of the effect of woodlands on reductions in mental health costs, and conversely the benefits forests provide in improving mental health. However visits to woods may alleviate some forms of mental illness more than others. Research seems to suggest that visits to woods and greenspace alleviate anxiety and stress (De Vries *et al.*, 2003; Hartig *et al.*, 1991; Henwood, 2001; Kaplan, 2004; O'Brien, 2004; Pretty *et al.*, 2005; Ulrich, 1984). But this condition is only part of an array of mental illness and may be the least expensive in terms of

¹⁰² However, the estimates assume that benefits for these individuals (exercising at least 5 times a week in woodlands) are entirely attributable to the woodland even though they may also be undertaking exercise in non-woodland settings.

total economic cost to society. Many people with anxiety and stress may consult doctors and alleviate their symptoms with drugs, but continue in their employment avoiding expensive in-patient treatment and claims for incapacity benefit due to mental ill health.

A GIS analysis undertaken by Forest Research from the 1991 Census¹⁰³ estimates that just over 1 million people live within 1 km of a forest or wood recorded in the National Inventory for Woodland and Trees database (i.e. with a minimum size of 2 ha and greater than 20% cover by tree crowns), and that just under 4 million live within 3 km.¹⁰⁴ Since 110.4 people per 1000 in Scotland experience anxiety and depression (Scottish Public Health Observatory, 2006), this would suggest that approximately 441,600 people living within 3 km of woods in Scotland suffer from anxiety and depression, assuming (following CJC Consulting, 2006) that those suffering mental health problems are evenly distributed within urban areas.¹⁰⁵ One of the models in the research by De Vries *et al.* (2003) shows that mental health is improved for all people living within 3 km of greenspace. If it is assumed (following CJC Consulting, 2006) that the coefficient in the De Vries' study indicates an improvement in mental health such that a person does not suffer from anxiety and depression, then the presence of woods results in 4,416 fewer people per year being subject to anxiety and depression. An alternative estimate can be derived by applying another De Vries model which investigates the effect of greenspace within 1 km and between 1 to 3 km on a person's mental health score. In the latter model only the coefficient for people living between 1 and 3 km is statistically significant. The use of this latter coefficient suggests that the presence of woods within 1 to 3 km of a person's residence reduces the number of mental health anxiety and depression cases by, 2,755.

Assuming that the average cost per anxiety and depression case is £2,532 (Layard, 2004) (which is the average cost per year per person suffering from mental illness) then the mental health value of woodland in Scotland lies between £7.7 million and £12.4 million per year (at 2007/08 prices). This can be capitalised at 3.5% to give a range of £221 million to £354 million. However there are several caveats to this estimate. For example the De Vries study was unable to derive a statistically significant effect for different types of greenspaces. Thus the Scottish aggregation assumes that all greenspace effects are attributable to woodlands. The mental health value outlined above assumes that the incidence of mental ill health is evenly distributed. However a report on environmental justice in Scotland showed that areas with high levels of deprivation in Scotland are less likely to have woodlands nearby (Fairburn *et al.*, 2005). The report however goes on to outline that for new woodland the analysis highlights that there is a tendency in planting towards deprived populations, outlining that current policies may be addressing the imbalance. Further research is needed in this area to map mental ill health within Scotland and woodland cover and use.

INDICATOR 21: PUBLIC PERCEPTIONS OF THE HEALTH AND WELL-BEING BENEFITS OF FORESTS

The F4P Omnibus Survey 2006 estimated that the proportion of the Scottish adult population who agreed or strongly agreed that woodlands are places to exercise and keep fit was 79%,

¹⁰³ The dataset used was an FCS spatial dataset derived from 1991 Census tabled data joined with Ordnance Survey Urban polygon data (Spatial data). This process has not been completed for more recent census data.

¹⁰⁴ This refers to accessible woodland (see Table 39). Since some of the mental health benefits may result from accessing, rather than simply viewing, local woodlands this is preferred to the population proximate to all woodlands. For all woodlands, the populations within 1 and 3 km are 3.840m and 4.533m respectively.

¹⁰⁵ This may be an over-estimate if those with mental health problems are located predominantly within inner city areas further away from woodland.

while the proportion who agreed or strongly agreed that woodlands were places to reduce stress and anxiety was 82%. (The UK Public Opinion of Forestry Survey 2007 asked the same questions, and derived similar figures from its Scottish respondents.) There was a small difference between the 16-34 year olds and the other age groups, with the older age groups agreeing more that woodlands were places to reduce stress and anxiety. Those who had visited woods in the previous 12 months strongly agreed (42%) with the statement to a greater extent than those who had not visited (25%) (see Figure 13), suggesting that those who do visit woods see this as an important benefit that can be derived from woodland use.

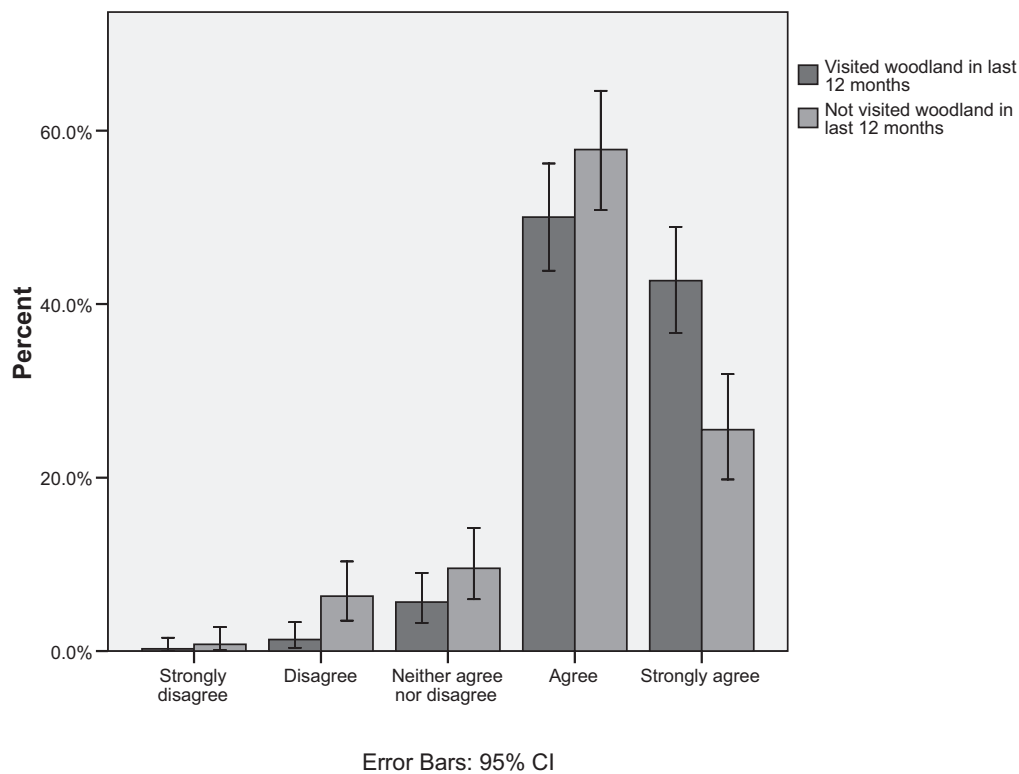


Figure 13. Percentage of respondents who perceived woodlands to be places to reduce stress and anxiety, by those who had or had not visited woodland in the previous 12 months

Additional evidence of positive public attitudes towards woodlands' contribution to health and well-being is given below.

An Omnibus Survey commissioned by Greenspace Scotland in 2007 concluded that 90% of respondents strongly agreed that greenspaces should be places where people can relax and unwind. However when respondents were then asked about the value of their own local greenspace, only 60% strongly agreed that it was somewhere that they could relax and unwind. This highlights a discrepancy between people's preferences and their current experience.

Of the respondents to the F4P Omnibus Survey 2006, who had gathered non-timber forest products in the previous 12 months, 24% felt that this activity in woodlands was very important for their ability to exercise, while 30% felt that the feelings of relaxation they gained from this activity were very important to them.

In the Scotland Public Opinion of Forestry Surveys 2005 and 2007 respondents were asked to select good reasons to support Scottish forestry for public benefit. In the 2005 survey 23% stated that a good reason to support forestry was to provide healthy places for physical activity, relaxation and stress relief. In the 2007 survey this figure had risen to 49% of respondents. The increase could be explained partly by the increased focus within Scotland on the health of the nation, and the work of FCS and other organisations in promoting the use of woods for healthy activities through, for example, the 'Active Woods' campaign (FC, 2008). 40% of those in the 2007 survey also suggested that a good reason to support forestry with public money was to provide places to cycle or ride horses and for 61% it was to provide places to walk in, which again highlights the importance of forests and woodlands as places for physical activities.

2.6 CULTURE AND LANDSCAPE

KEY FINDINGS

There are 1,418 scheduled ancient monuments located within Scottish forests, and 150 recorded Heritage Trees and at least 1,000 recorded Ancient Trees in Scotland.

An estimated 3.5% of the Scottish adult population who had visited woodlands in the previous 12 months said that their visits had involved seeing something of cultural interest in the wood (e.g. cultural features such as sculptures, ancient trees or historic sites). Approximately 7% of all visits to woodlands involved seeing features such as these.

Approximately 1.5% of the Scottish adult population who had visited woodlands in the previous 12 months said that they had attended a cultural event or activity while in woodland.

Around 3% of events organised by Forestry Commission Scotland between mid-2006 and mid-2007 were considered to have had 'cultural activities' as the primary purpose. These events involved a total of 4,900 visits (i.e. 4% of all visits to organised events).

Preliminary results from viewshed analyses suggest that approximately 557,000 people in Scotland have visible woodland within 1 km of their homes, while 275,000 people have visible woodland within 300 m of their homes. The economic value of woodland views from homes and on journeys by commuters in Scotland is estimated to be between £21 million and £90 million per year at 2007/08 prices, depending upon the assumptions used.

An estimated 95% of the Scottish adult population agree or strongly agree that woodlands in Scotland are an important part of the country's natural and cultural heritage.

Around 57% of the Scottish adult population are estimated to gain substantial benefit from seeing trees or woods from where they live, while 50% are estimated to gain substantial benefit from seeing trees or woods as they undertake their daily activities.

An estimated 68% of the Scottish adult population gain substantial benefit from knowing that there are trees and woods in Scotland, while around 72% gain substantial benefit from knowing that Scottish woodlands will be there for future generations. 70% gain substantial benefit knowing that Scottish woodlands provide a place for wildlife.

BACKGROUND

This theme is concerned with the cultural and aesthetic values that people attach to the presence of woodlands and forests in the Scottish rural and urban landscape, and the non-use values people derive from knowing that trees exist for the benefit of present and future generations, and as a habitat for biodiversity preservation. These three related perspectives are introduced below.

Cultural values

The cultural benefits of forests can be particularly difficult to define and value, since many are intangible, such as those that relate to meaning and identity, and attempts to quantify them are often considered inappropriate or controversial. Intangible cultural values are also

difficult to separate from each other, yet they are undeniably important and often rank higher in stakeholder consultations carried out for forest planning and policy-making than timber benefits. In response to this interest, a range of forest-related organisations and woodland owners in Scotland provide opportunities for performance art in woodland settings, art installations (e.g. sculptures) and organise public events with a primary or secondary cultural purpose. A recent review of the FC's involvement in the arts across Great Britain, and its options for the future, is given by Pritchard (2008).

The overall aim of the Scottish Government policy on culture is to encourage the "widest possible participation in a vigorous and diverse cultural life bringing real benefits for communities and individuals".¹⁰⁶ In this context, FCS has developed a policy on "the arts in, about, or using woodland", which sees the role of the arts as a way to "help communities develop their local identity through the cultural setting and historic environment in woodlands and through living culture, including the Gaelic language and the performing arts". In addition, artistic events and projects, typically led by other organisations, are seen as a means to deliver key objectives in the Scottish Forestry Strategy, namely to assist community participation, enhance opportunities for health and enjoyment and increase the contribution of forestry to tourism (FCS, 2007f). The policy recognises that woodland-related arts include interpretations of, or responses to, the historic environment as well as forms of contemporary art.

The following typology provides a basis for quantifying and describing the cultural benefits of forests: a) cultural sites and features, b) cultural activities, practices, skills and events, and c) meanings, identities and representations (Edwards, 2006). Each category can be further divided as follows:

1. Sites and features

- Cultural heritage sites and features located *in the forest*, for which the forest is not a direct part of their cultural value (although the presence of forest may add to the visitor experience). Typically this category will include Scheduled Ancient Monuments.
- Cultural heritage sites and features *of the forest*, such as ancient, heritage and champion trees, ancient forests and cultural landscapes, which have particular cultural interest because they have been, or continue to be, managed in traditional ways.
- Modern sites and features such as sculptures or ecologically-sensitive-designed interpretation centres or other structures, which have cultural interest to the public beyond their purely practical function, and which interpret or interact with their forest setting.

2. Activities, practices, skills and events

- Cultural activities, practices, skills and events located *in the forest*, for which the forest is not a direct part of their cultural value (although the presence of forest may add to the visitor experience). This category includes jogging, walking, mountain biking, car rallies and music concerts in forests.
- Cultural activities, practices and skills *of the forest*, including the cultural aspects of livelihood strategies and ways of life, whose cultural value is inseparable from the forest and trees. Examples include traditional crafts, coppicing, NTFP collection and hunting, where specialist traditional knowledge and skills relating to forests are required. Events of the forest may include musical or theatrical performances, which interpret or interact with the forest.

¹⁰⁶ www.scotland.gov.uk/Topics/ArtsCulture

3. Meanings, identities, and representations

- Meanings, associations, beliefs, and norms attached to specific forest-based natural or cultural sites or features, to forests and trees in general, or to forest-based activities, by individuals or groups.
- Spiritual or emotional attachment to, or identification with, specific forest-based natural or cultural sites or features, to forests and trees in general, or to forest-based activities, by individuals or groups.
- Inspiration derived for art, advertising and the media, from forest-based natural or cultural sites or features, forests and trees in general, forest-based activities, or meanings, identities and representations of trees and forests (Edwards, 2006).

Partly for the reasons mentioned above, there are still relatively few studies that seek to place an economic value on cultural and heritage assets. In most UK studies, a substantial proportion of research participants (30-50%) were not willing to pay anything for access or restoration of historic sites. This finding implies that interest in cultural heritage, as reflected in a positive willingness to pay is far from universal in the population (CJC Consulting, 2006: 55).

One simple way to quantify aspects of the cultural benefits of forests is by estimating the number of cultural sites and features of different kinds located in Scottish forests. This is attempted for Indicator 22. It is acknowledged that this measure alone is a poor proxy for the values attached to cultural events, activities and sites by the Scottish population, since many of them may not have been visited or even known about except by a small number of forest managers or experts. Where possible, the indicator goes further by assessing numbers of people visiting, and/or numbers of visits, over a 12 month period. A second approach to valuing cultural benefits is to assess public perceptions of the cultural value of forests, and the results from recent surveys are presented under Indicator 25, together with related perceptions of the contribution of woodlands and forests to the quality of the Scottish rural landscape and urban greenspace.

Aesthetic values

For the purposes of this report, the aesthetic values derived through forests in Scotland refer specifically to the benefits gained by the Scottish population from seeing forests from where they live or when they undertake their daily activities, rather than through visits within the forest itself, which are covered by other themes in particular, 'recreation and accessibility', 'learning and education', and 'health and well-being'. This is an important value as a view from the window or living in a pleasant environment provides benefits for many people, including health and well-being benefits (Ulrich, 1991), and by contributing to self identities (Myers *et al.*, 2003). Aesthetic values are also reflected in property prices. A report on greenspace and house prices in London found that the amount of greenspace in wards was the fifth most significant indicator in explaining the variation in average house prices. The top four factors were level of income support, travel time to central London, average air quality, and dwelling density (Greater London Authority, 2003).

Using a novel methodology involving GIS-based viewshed analysis to estimate the proportion of residences in Scotland that have views of forests, a tentative non-market value for forests in the landscape is derived. Evidence is also drawn from the F4P Omnibus Survey 2006, and from the study conducted by CJC Consulting (2006), which presents a review of existing attempts to assess the landscape value of forestry in Scotland. In the two case study areas, qualitative research was used to explore the ways in which research respondents benefit from the visual amenity of woodlands and forests and how these aesthetic values contribute to the general quality of life of resident populations.

Non-use values

People value forests and woodlands, not just by visiting them, or by seeing them from a distance, but also simply by knowing that they exist, or that they exist for future generations to experience (bequest value), or as habitats for the preservation of biodiversity (existence value). Such non-use values are difficult to separate, but an attempt has been made to assess them by measuring public attitudes towards their importance. Data from the F4P Omnibus Survey 2006 is presented under Indicator 23 below.

INDICATOR 22: NUMBER OF FOREST-BASED CULTURAL EVENTS AND SITES, AND NUMBER OF VISITS

Number of cultural sites

Sites and features with cultural value that are located within Scottish forests and greenspace include Scheduled Ancient Monuments (SAMs), and individual trees with remarkable characteristics. Efforts have been made to define, locate and catalogue these features. Other features have not yet been systematically assessed.

According to the FC (2002) there are 1,418 Scheduled Ancient Monuments (SAMs) located within woodlands in Scotland, of which 348 are on FCS land. Regarding individual trees of cultural value, various types have been defined and catalogued, including heritage, ancient or veteran, and champion trees.

Heritage trees are defined as trees that are revered for their historical, cultural and botanical significance, for example because they are very old, have interesting historical associations or are champions of record dimensions (Rodger *et al.*, 2003). Treefest (2006) lists 192 candidates for heritage trees in Scotland, and, of these, 150 have been awarded the title of heritage tree (Rodger *et al.*, 2003). Ancient (or veteran) trees are defined as trees that are old relative to others of the same species, and are of interest biologically, aesthetically or culturally because of their age (Woodland Trust, 2006). A birch tree is considered to be a veteran at 200 years old, while a yew has to survive for at least 1000 years before it is considered ancient (Treefest, 2006). According to The Woodland Trust there are at least 1,000 recorded ancient trees in Scotland. Champion trees are trees that have record dimensions (girth, height, amount of timber etc.) relative to others in its species (Treefest, 2006). The Tree Register has a database which lists over 4,000 champion trees, many of which are in Scotland. It also has a database of ancient, veteran and significant yews, of which 12 are located in Scotland.

Number of visits to cultural events and sites

The F4P Omnibus Surveys 2006 and 2007 asked Scottish adults who had visited a woodland in the previous 12 months whether any of their visits had involved "seeing something in the wood (e.g. sculptures, ancient trees, or historic sites)". In the 2006 Survey, 5% said that at least one of their visits had involved this activity, while in the 2007 Survey the figure increased to 10%. In 2007 additional questions were asked, which allow us to estimate that 7% of all visits to forests in the previous 12 months had involved seeing these features (see Table 30 under 'recreation and accessibility').

Likewise the Surveys asked Scottish adults whether they had attended a cultural event or activity while in woodland. For both the 2006 and 2007 Surveys, 1% said that they had. For the 2007 Survey the percentage of all visits to forests that involved attending such an event or activity was 2%. From these data it would be possible to derive a very approximate estimate of 84,000 for the number of visits to cultural events and sites during the 12 month period covered by the F4P Survey in 2007, although this figure should be used with caution because the sample sizes are very low.

The F4P Survey of Activities 2007 also provides data on number of cultural events, and number of visits to those events, organised by FCS as reported under the 'recreation and accessibility' theme. Out of the 1,517 events that were organised by FCS in the 12 months prior to the Survey, 51 events (3%) were considered to have had 'cultural activities' as the primary purpose. Cultural events involved a total of 4,900 visits (4% of all visits to organised events). These data need to be interpreted in the context of alternative 'primary purposes' that were offered to FCS respondents in the questionnaire (see Table 32).

INDICATOR 23: THE VALUE OF FOREST LANDSCAPES TO THE SCOTTISH POPULATION

The landscape value of woodland can be measured by both revealed preferences, such as hedonic price models (HPMs), and expressed preferences, such as contingent valuation (CV) and choice experiment (CE) techniques. Ascertaining a robust estimate of the total landscape value of woodlands in Scotland presents problems, not least because values are likely to vary considerably across different woodland and management types. A revealed preference study showed that a 1% increase in the proportion of broadleaved woodland in a given 1 km square of FC-managed woodland increased the expected selling price of a property by £42.81, while a similar increase in the proportion of mature conifers (mainly Sitka spruce) reduced the expected selling price of a house by £141 (Willis and Garrod, 1992).

A further complication is that the total value of a given landscape is likely to be made up of many different land cover types, so that isolating the value added (or detracted) by woodland from other landscape characteristics presents particular methodological challenges. In a valuation of the Breadalbane ESA in Scotland, Hanley *et al.* (1996) used expressed preference methods to evaluate the importance of native woodland protection compared with other land cover types (grassland, moorland, walls and archaeology). The results suggest that respondents were willing to pay 82p per year to protect woodlands in the context of having to pay to conserve the other features of the ESA. By simultaneously valuing woodland in relation to other landscape attributes, Hanley *et al.*'s study represents a valuable attempt to assess the landscape value of woodland. However, this value cannot be generalised across Scotland because the study is specific to one area, it lacks detail on forest attributes in relation to landscape types, and the value presented relates to both use and non-use values.

A recent stated preference study by Garrod (2002) sought to address some of these issues by assessing the landscape value of forests in relation to both tree type (conifer and broadleaf), and landscape context (for conifer: plateau, mountain, and hilly/rolling landscape), (for broadleaf: mountain, hilly/rolling, and peri-urban). This study has provided the basis for estimates of the aggregate landscape value of Scottish woodlands in a peri-urban context (Willis *et al.*, 2003). Based on a calculation that 19,875 households had urban woodland views, the landscape value of views of Scottish forests and woods was then calculated as the annual willingness to pay for these urban fringe households (£268.79) for the 'with view' compared to 'without view' scenario, producing an annual value of £5.3 million and a capitalised value of £153 million for forest views from urban houses (capitalised at 3.5% per year).

However, there was considerable uncertainty in the Garrod (2002) study about the number of households with views of forests. More recently, Forest Research has produced more accurate estimates of the number of hectares of forest visible by households in urban areas with a population greater than 500 people, as well as the population and number of households in these urban areas who have a view of woodland. In addition, a GIS viewshed analysis undertaken by Forest Research showed that 10,478 ha of forest listed in the National Inventory of Woodland and Trees was visible in a 1 km radius from settlements with

a population greater than 500 people.¹⁰⁷ This area varied from 44 ha in Fort Augustus Forest District, to 999 ha in Inverness, to 5,543 in the Scottish Lowlands (see Table 39). Data on the number of households with a view of forests and woodland in a peri-urban setting is also reported in Table 39.

The viewshed analysis shows that approximately 557,000 people, or 242,000 households, have visible woodland within 1 km of their homes, and that approximately 275,000 people, or 120,000 households, have visible woodland within 300 m of their homes. The majority of visible woodland lies within Scottish Lowlands Forest District, because this district included over 70% of the Scottish population. It should be noted, however, that this GIS analysis does not distinguish between views of broadleaved woodland and conifer woodland, and that the Garrod willingness to pay value was for views of peri-urban broadleaved woodland.

Table 39. Visibility of forest and woodland from settlements with >500 people: hectares visible and number of households with woodland visibility

FCS Forest District	NIWT woodland (ha) visible within 1 km	Households with visibility of woodland within 1 km	Households with visibility of woodland within 300 m
Aberdeenshire	506	13,757	4,262
Ae	265	5,182	1,975
Cowal and Trossachs	817	5,788	3,787
Dornoch	211	2,026	943
Fort Augustus	44	364	198
Galloway	133	2,236	928
Inverness	999	7,758	4,215
Lochaber	197	1,101	559
Lorne	98	923	740
Moray	340	4,157	1,641
Scottish Borders	324	6,048	2,650
Scottish Lowlands ¹⁰⁸	5,543	170,463	89,150
Tay	856	20,082	7,987
West Argyll	147	1,205	659
Total	10,478	242,073	119,695

Source: Forest Research GIS analysis¹⁰⁹

Assuming a landscape value of household views of woodland of £307 per household¹¹⁰ and multiplying this by the number of households with a view of woodland within 300 m and 1 km (from the viewshed analysis), indicates corresponding landscape values of £37 million and £74 million per year in 2007/08 prices, giving capitalised landscape values of £1,050 million and £2,120 million for woodland views from homes in Scotland. These estimates should be treated with caution, however, as they are based upon a landscape value for broadleaved

¹⁰⁷ 55,486 ha of woodland were visible within 3 km.

¹⁰⁸ The estimates for numbers of households with woodland views within 1 km do not include the 983 households with woodland views within Inner Glasgow. For the case of 300 m, the proportion of households with woodland views within inner urban areas was substantially higher, and they were therefore included in the analysis.

¹⁰⁹ The estimated number of households is based upon the same assumption adopted by CJC Consulting (2006) of 2.3 people per household.

¹¹⁰ This follows the method adopted by CJC Consulting (2006: 46) with the figure of £296.87, representing the Garrod (2002) study value in 2006 prices, reflated to 2007/08 prices.

woodland, whereas some of these households will have views of conifers, and also as it takes no account of how values of woodland views vary with distance from a household's home (for example, as distance increases, the value may decrease).¹¹¹ If only views of broadleaved woodland are considered, this would give much lower estimates. For example, the NIWT1 database indicates that only 14% of woodland in Scotland is classified as broadleaved. Were this proportion also assumed to represent the proportion of households' woodland views that are of broadleaves, this would give estimates of household views of broadleaved woodland of £5 million and £10 million per year at 2007/08 prices, and capitalised landscape values of £150 million and £300 million corresponding to 300 m and 1 km maximum distances.

To summarise, the economic value of woodland views from homes in Scotland is estimated to be between £5 million and £74 million per year at 2007/08 prices. More research would be required to refine these estimates further (as outlined in Section 4).

CJC Consulting also use Garrod's (2002) estimates to present the capitalised value of views of urban fringe broadleaved woodland on journeys. The authors use 1991 Census data to calculate the proportion of population in predominantly rural wards plus mixed rural wards who commuted outside the district. They make the assumption that these households commute into an urban area, and multiply the number of households that commute by the probability that they encounter an urban fringe broadleaved woodland on their journey (using FC estimates that 15.5% of the urban and urban fringe area has tree cover). The capitalised value, at 3.5%, of the average household's willingness to pay for views of urban fringe broadleaved woodland on journeys, is £6,473. This value was multiplied by the number of commuting households who encounter this woodland, and produced a capitalised value of £391 million at 2002 prices or £448 million at 2007/08 prices, i.e. about £15.7 million per year. This figure is likely to be a conservative estimate of the value of woodland views on journeys as it is based on commuting trips only. There are many other types of journey with woodland views, for which people would be prepared to pay. Further research would be required to produce more accurate estimates of the value of woodland views encountered during all journey types.

INDICATOR 24: PUBLIC PERCEPTIONS OF THE CULTURAL AND LANDSCAPE BENEFITS OF FORESTS

Cultural benefits

The F4P Omnibus Survey 2006 estimated that 95% of the adult Scottish population either agree (51%), or strongly agree (44%) with the statement that woodlands in Scotland are an important part of the country's natural and cultural heritage (see Figure 14). The older age groups were also more likely to strongly agree than the 16-34 age group. There appeared to be slight ethnic differences with 95% of the white population agreeing with this statement and 87% of the minority ethnic population agreeing. The question referred to both 'natural' and 'cultural' heritage, and there is much overlap between the two categories, as outlined in the typology above. The results for this question are similar to those derived by the UK Public Opinion Forestry Survey 2007 in which 54% of Scottish respondents agreed and 41% strongly agreed with an identical statement.

¹¹¹ Distances to woodland in the pictures shown to respondents in the Garrod (2002) study are not known precisely, but 300 m may be a reasonable approximation to the average and 1 km a reasonable approximation to the maximum distance for which valuations based upon these woodland views apply. (The typical woodland view associated with the viewshed analysis results for all woodlands within 1 km will also be for a distance well under 1 km.) The approach taken here is more conservative than that adopted by CJC Consulting (2006) which included a high estimate based upon woodlands within 3 km.

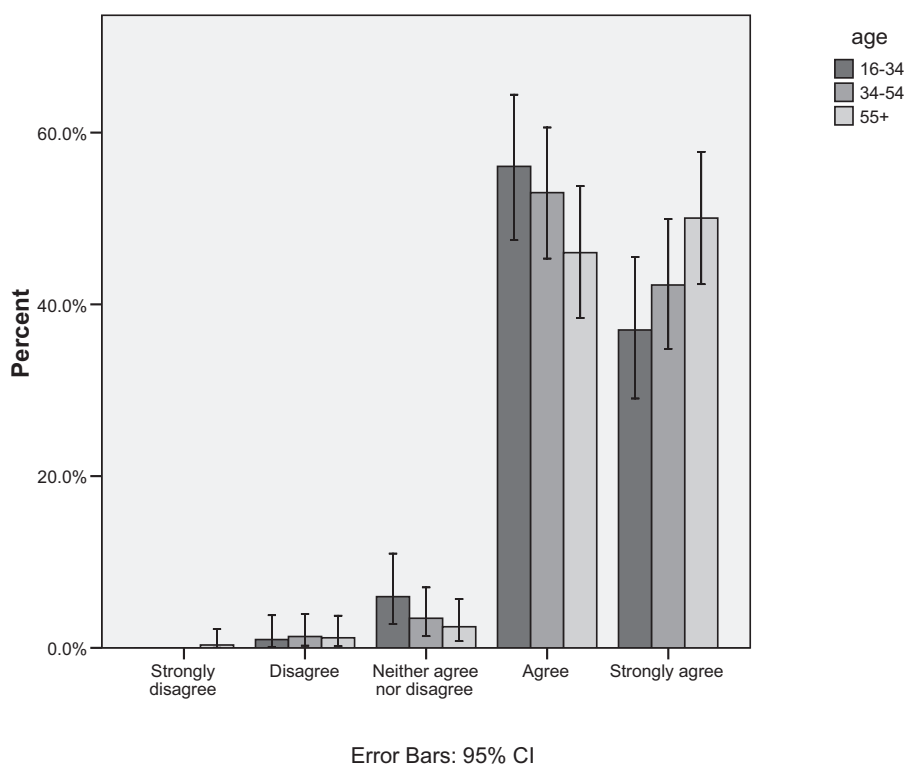


Figure 14. Percentage of respondents who perceived woodlands in Scotland to be an important part of the country's cultural heritage, by age class

The F4P Omnibus Survey 2006 also showed that 13% of the total Scottish adult population had gathered NTFPs in woodlands in the previous 12 months, and that, for a quarter of these people, gathering NTFPs was either important or very important to their religious and spiritual well-being.

Landscape benefits

Based on the findings of the F4P Omnibus Survey 2006, 57% of people said that they received a substantial benefit from seeing trees and woodlands from where they lived. Seeing trees and woodlands seemed to be more important to respondents aged between 35-54 and 55+yrs, of whom 63% and 66%, respectively, gain a substantial benefit. Among those aged between 16-34, only 39% said that they gain substantial benefits (see Figure 15). Substantial benefits were received fairly evenly across socio-economic groups (AB=62%, C1=60%, C2=53%, DE=54%), and between 'white' and 'other (non-white)' ethnic groups (57% and 59%, respectively).

The Survey also concluded that 50% the Scottish adult population received substantial benefits from seeing trees and woodlands as they undertook their daily activities. Respondents were able to interpret the phrase 'daily activities' according to their own circumstances, which may have included travelling to work, local shops, or taking children to school. Seeing trees and woodlands on a routine basis was slightly more important to women than to men (53% and 46% respectively). Substantial benefits seemed to accrue fairly evenly across socio-economic groups (AB=55%, C1=52%, C2=42%, DE=50%) and ethnic groups ('white'=50%, 'other', i.e. non-white=57%). Again, however, there is some variation across age groups, with more older people than younger people benefiting substantially (16-34 years=36%, 35-54 years=54%, 55+ years=57%). However, respondents from the 15% most deprived areas gained substantial benefit to a greater degree than those from all other areas (55% as opposed to 49%). Also, respondents who had visited woodlands

in the previous twelve months were more likely to receive substantial benefit than those who had not visited (56% and 42% respectively).

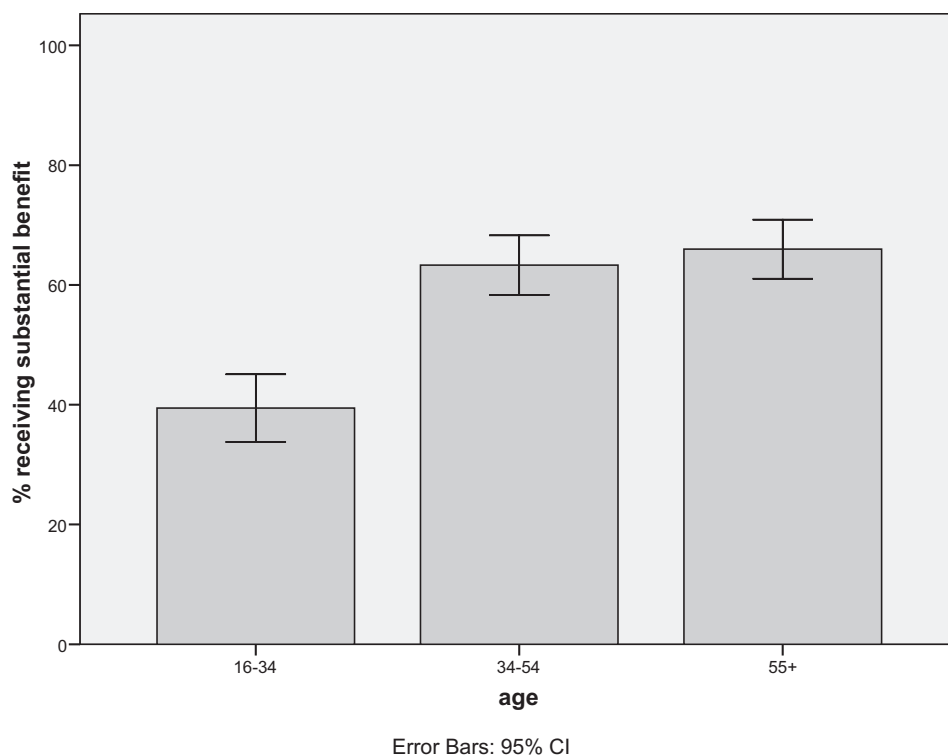


Figure 15. Percentage of respondents receiving a substantial benefit from seeing trees and woodlands from where they live, by age class

The UK Public Opinion of Forestry Survey 2007 asked respondents to state their level of agreement with the statement that trees and woods make towns and cities more attractive places to live, work and bring up families. Of the Scottish respondents to the question, 92% agreed or strongly agreed with the statement. Similarly, the Greenspace Scotland Omnibus Survey 2007 concluded that 85% of respondents strongly agreed, and 12% slightly agreed, that greenspaces make an area a great place to live. When asked whether their local greenspaces made their area a great place to live 48% strongly agreed and 28% agreed slightly. The survey also found that 85% strongly agreed that greenspaces should be attractive places and that when asked about their local area only 56% said their local greenspace actually was attractive. This suggests that respondents would like to see improvements in the quality and attractiveness of their local greenspaces (Greenspace Scotland, 2007).

The F4P Omnibus Survey 2007 asked Scottish residents additional related questions to assess how important locally available greenspace, such as woods, parks or the countryside, was to their decision to live at their current address. 57% of respondents stated that greenspace was very or quite important in their decision to live at their current address. The proportion was higher for those in the 35-54 and 55+ years age groups (60% and 63% respectively) than for those in the 16-34 year age group (43%). However those in the 16-34 year age group were much more likely to state that they had no choice or did not make the decision of where to live than the older age groups (16-34 years=25%, 35-54 years=6%, and 55+ years=7%). There were also differences reflected in the socio-economic groups particularly between the DE and AB groups, with the DE group being more likely to state that they have no choice about where they lived or did not make the decision compared with the

AB group (15% and 5% respectively). Of the respondents from the 15% most deprived areas, 19% said that they had no choice about where they lived compared to 10% who were not in deprived areas. Those who had visited forests in the previous 12 months were more likely to state that locally available greenspace was very or quite important in their decision to live at their current address compared to those who had not visited (66% and 51% respectively).

Finally, the UK Public Opinion of Forestry Survey 2007 also revealed a set of public attitudes regarding reasons to use public money for forestry. 43% of Scottish respondents stated that a good reason to support Scottish forestry with public money was to create pleasant settings for new and existing developments around towns. 56% felt that improving the countryside landscape was a good reason: an increase from 31% in the equivalent survey in 2005. 36% suggested that a good reason was to restore former industrial land.

INDICATOR 25: PERCENTAGE OF POPULATION WHO BENEFIT FROM KNOWING THAT THERE ARE TREES AND WOODLANDS IN SCOTLAND

This indicator is assessed using data from the F4P Omnibus Survey 2006, which measured public attitudes towards three perspectives on non-use values of forests: a) the value of knowing that trees and woodlands exist in Scotland (regardless of whether respondents intend to visit them), b) the value of knowing that they will be available for future generations, and c) the value of knowing that they exist as a habitat for biodiversity preservation. These are discussed below.

Knowing that there are trees and woodlands in Scotland

The Survey revealed that 68% of the Scottish adult population gained substantial benefit from knowing that there are trees and woodlands in Scotland. Those aged 35-54 years and 55+ years were more likely to gain substantial benefit from this knowledge (69% and 73% respectively) than those who were aged between 16-34 years (60%). Those in the AB socio-economic group were more likely to state that they gained substantial benefit (74%) than those in the other groups (C1 67%, C2 64% and DE 66%). Those in the 15% most deprived areas in Scotland were more likely to state that they gained substantial benefit (74%) than those who were not in this category (67%), although the figures need to be treated with caution due to the relatively small difference, and the small sample of respondents from deprived areas. Those who had visited woodlands in the previous 12 months (76%) were more likely to state that they gained substantial benefit compared to those who had not visited (57%).

Knowing that Scottish woodlands will be there for future generations

The Survey showed that 72% of Scottish adult respondents stated that they gained substantial benefit from knowing that Scottish woods will be there for future generations. As before, those aged 35-54 years and 55+ years were more likely to gain substantial benefit (72% and 77%) than those aged between 16-34 years (63%). Those in the AB and C1 social groups were more likely to gain substantial benefit (75% and 76% respectively) than those in the C2 and DE groups (68% in both categories). Those who had visited forests in the previous 12 months were more likely to state that they gained substantial benefit (81%) than those who had not visited (60%).

Knowing that Scottish woodlands provide a place for wildlife

A comparable figure of 70% of Scottish adult respondents stated that they gained substantial benefit from knowing that Scottish woodlands provide a place for wildlife. This is

substantiated by the Scotland Public Opinion of Forestry Survey 2007 in which the main reason people chose for publicly supporting forestry in Scotland was to provide places for wildlife to live: 67% of respondents chose this. It was also the main reason given for publicly funding forestry in the equivalent surveys in 2003 and 2005. In the F4P Omnibus Survey 2006, as before, those aged 35-54 years and 55+ years were more likely to gain substantial benefit from knowing that Scottish woods provide a place for wildlife (71% and 75% respectively) than those aged 16-34 years (60%). Women were more likely to gain substantial benefit (72%) than men (67%). Those in socio-economic group DE (71%) were slightly more likely to gain substantial benefit than those in the AB (69%), C1 (67%) or C2 (69%) groups. This concurs with the respondents from the 15% most deprived areas who stated that they gained substantial benefit (76%) to a greater degree compared to the rest of the population (68%), although these conclusions need to be treated with caution because of the small differences, and small sample of respondents from some social categories. Those who had visited forests in the previous 12 months were more likely to gain substantial benefit (74%) than those who had not visited (63%).

2.7 COMMUNITY CAPACITY

KEY FINDINGS

An estimated total of 138 community woodland groups are active in Scotland, with an estimated total membership of around 13,500.

Of the sample of community woodland groups surveyed in 2007, 66% of their directors, committee members and trustees were male, 28% were over 60 years of age, 5% were people with a disability, and all were from a 'white' ethnic background.

The total number of woodlands managed by community woodland groups in Scotland is estimated to be around 250, covering a total of 18,275 ha, or around 1.4% of the total woodland area in Scotland.

The total annual income that was received by community woodland groups in Scotland between mid-2006 and mid-2007 is estimated to be around £4.5 million, of which 50% was grants from public bodies, 17% from donations, 10% from membership fees, 6% from sales of forest products, and 6% from sales of other goods and services.

The proportion of Scottish adults who were involved in, or consulted about, forestry plans in the 12 months prior to mid-2006 is estimated to be 2%, while 83% agreed or strongly agreed that it is important to have a say in what happens in their local woodland.

Around 65% of the Scottish adult population are estimated to agree or strongly agree that woodlands are good places to meet with friends and family.

BACKGROUND

Approaches to community development in the forestry sector have evolved over recent decades from a focus on a 'service delivery' model, where communities are seen as passive entities that can be developed through the provision of external inputs, to an approach where communities are seen as active agents taking a lead role in identifying and realising their own goals. In the latter model, which could be described as 'capacity building', intervention is seen as a means to mobilise latent skills and resources within the local community (cf. Donoghue and Sturtevant, 2007). The term 'community capacity' is used here to express those local skills and resources, and the abilities of local people to direct them towards realising shared goals, often by working in partnership with a range of external agencies to access new sources of income.

'Community capacity' was identified as a theme for inclusion in this project during the scoping study (Hislop and Elliott, 2005), which revealed a cluster of related perceptions held by stakeholders of the benefits of forestry to local communities, as illustrated by the following statements:

"It can be very positive I think for bringing the community together in a common purpose."

"...it has increased their self confidence because they have been working with people. They have done things that they didn't know they could do."

“...there is a range of opportunities to actually reconnect people back into decision-making processes: that whole dimension which comes through engagement, through empowerment, through ownership, which has a wide range of social benefits for people... restoring an individual’s confidence... a degree of self esteem.”

“It would be a sense of local use, local control, local ownership. A sense of belonging, maybe.”

“But it is more than just a nice place to walk the dogs.... [its about] being part of something. ...and also the sociability factor is very high. ...meeting other people, find out what’s going on in the area. And they interconnect with people they would not normally connect with. And again there is a value in that” (Hislop and Elliott, 2005: 12).

The literature review carried out for the project identified evidence of the types of benefits provided by forestry in a community setting. Mendis-Millard and Reed (2007) provide a useful review and highlighted the following components: community stability (cf. Machlis *et al.*, 1990), community well-being (cf. Marchak, 1990), community resiliency (cf. Harris *et al.*, 1998), quality of life (cf. Vogel, 1997), and community sustainability (cf. Parkins *et al.*, 2001). Similarly broad in focus, a review of literature on social and cultural services of ecosystems by Chiesura and de Groot (2002) identified positive links between engagement with the environment and the quality of social relationships. They state that “nature encourages the use of outdoor spaces, increases social integration and positive social interaction among neighbours in public housing projects” (citing Coley *et al.*, 1997: 225). They also suggest that “the presence of trees and grass in outdoor common spaces may promote the development of social ties” (citing Kuo *et al.*, 1998). Reviewing literature more closely related to forestry, Willis cites a study carried out in Chicago which showed that: “In buildings with trees, residents reported significantly better relations and stronger feelings of unity and cohesion with neighbours, and greater reliance on more constructive and less violent means of dealing with conflict” (Sullivan and Kuo, 1993, cited in Willis 2003: 3.2.4).

The benefits that are derived through forestry at the community level, identified during the scoping study and literature reviews summarised above, can be divided into two types: those that are realised at the level of the individual, and those that are realised at the level of the community (or other social group). The benefits at the individual level include self-esteem and self-confidence, personal identity, sense of belonging, ownership, empowerment, well-being, and quality of life. These may be ends in themselves, or the means to achieve other personal goals. A simple measure of such benefits at the national level is the level of participation in community woodland groups and related initiatives, and in forestry consultation exercises. They are covered in particular by Indicators 26 and 29.

Benefits to the community as a whole include social connectedness, cohesion, stability, resilience and integration, as well as ‘community capacity’ itself. Again, these may be seen as ends in themselves, or means to achieve other shared goals. The term ‘social capital’ is often used as a metaphor to cover this broad range of attributes. Social capital can be defined more precisely as a combination of two elements: social connectedness, and related norms of reciprocity and trust (Putnam, 1993). It is often asserted that there is a causal link between high levels of social capital in a community or society and a range of positive social and economic outcomes. In this sense ‘social capital’ may act in a similar way to ‘community capacity’ as a means to achieve shared goals. However, further research would be needed to clarify the multiple definitions used for these various concepts, to tease out their relationships, and to identify possible external interventions that may help to ‘build’ social capital or community capacity in the context of community forestry in Scotland.

One way to measure community capacity in community woodland groups is to assess levels of income and expenditure, which allows conclusions to be made about the economic sustainability of the social forestry sector in Scotland. This is addressed under Indicator 28, while Section 3 explores both individual and community-level benefits of forestry from the perspective of lived experience in the two case study regions.

INDICATOR 26: NUMBER OF COMMUNITY WOODLAND GROUPS, NUMBER OF MEMBERS AND LEVELS OF INVOLVEMENT

The F4P Survey of Activities included questions for community woodland groups to provide a profile of the sector in Scotland (see Annex 3). A widely used definition of 'community woodland group', in a Scottish context, is given by MacIntyre (2002) as: "a body, which may or may not be constituted, consisting of individuals and possibly agency representatives, with a primary aim to develop a relationship with one or more woodlands. The body may be geographically defined, or may be defined in terms of a grouping of like-minded individuals (i.e. a community of interest). The body may or may not be democratically accountable to the community which it claims to represent."

The number of community woodland groups, as defined above, that were identified during the F4P Survey of Activities was 138. This figure was ascertained in December 2007 after completing work on a database of organisations in Scotland who carry out significant amounts of forest-related work, which formed the basis for the questionnaire survey. Of this total, 83 were members of the Community Woodland Association (CWA), while the majority of the remainder were partnerships with FCS. The total is a slight under-estimate because five of the CWA members included in the figure were umbrella organisations, each of which represented a range of smaller groups including some 'community woodland groups' as defined above. Several members of CWA were either 'individuals' or 'associations' (including for example some local authorities) and these were not included in the total figure because they do not fit the definition of community woodland groups used here.

The F4P Survey questionnaire asked community woodland groups to record the number of members. From this data the total number of members of all 138 groups, at the time of the Survey, is estimated to be 13,496. The total figure was rated up from the data provided by respondents, using conservative assumptions, as described in Section 1.

Other estimates are available. The F4P Omnibus Survey 2006 asked participants if they had been a member of a community-based woodland group during the past 12 months (see Table 48). 0.69% of the participants in the survey responded positively to the question. This value falls within the confidence interval for the figure of 13,496 derived from the F4P Survey of Activities in 2007 given above. Previously, CJC Consulting (2006) estimated a total involvement in community woodlands of approximately 8,800 people, based upon a total of 88 groups, of whom approximately 2,000 have the greatest involvement as directors or volunteers. The new figure derived from the F4P Survey is considered to be the best estimate currently available.

The Survey of Activities also asked respondents to recall the number of directors, committee members and trustees, and to separate the total according to gender, age, (dis)ability and ethnicity. This provides a measure of how many people, and what type of people, are involved in decision-making within the group. The average number per group was eight directors, committee members and trustees. Their social characteristics are given in Table 40.

Table 40. Social characteristics of directors, committee members and trustees of community woodland groups in Scotland

Social category		Percentage (weighted) ¹¹²
Gender	Male	66
	Female	34
Age (years)	Under 25	2
	25-60	70
	Over 60	28
Disability	Disabled	5
	Not-disabled	95
Ethnicity	White	100
	Mixed	0
	Asian	0
	Black	0
	Other	0

Source: F4P Survey of Activities (2007)

These data suggest that the committee members of community woodland groups are probably predominantly white, middle-aged men. The F4P Omnibus Survey 2006 questions regarding membership of community-based woodland groups also identified significant differences between socio-economic groups and the likelihood of being a member of such a group. Almost all respondents to this question identified themselves as being in socio-economic group C1.

The F4P Survey of Activities also asked respondents to record when their group was formed. The results are presented in Table 41 as percentages of all groups within different year classes. The results are weighted to represent all 138 known groups.

Table 41. Percentage of community woodland groups formed in different year classes

Year of formation	Percentage of groups (weighted)
Pre-1990	4
1990-1994	11
1995-1999	26
2000-2004	39
Post-2004	19
Total	100

Source: F4P Survey of Activities (2007)

The F4P Survey of Activities also asked each respondent to locate their group within one of four categories of level of community involvement in the group. The data is given in Table 42.

Table 42. Level of community involvement, as a percentage of all groups

Level of involvement	Percentage of groups (weighted)
Community control	64.4
Community led partnership	21.7
Agency-led partnership	4.4
No control	9.3
Total	100

Source: F4P Survey of Activities (2007)

¹¹² The weighting applied to Tables 40-47 is the ratio of the relative population sizes for each sub-sector (see Table 4).

The categories of level of involvement are defined as follows (after MacIntyre, 2002):

Community control: An organisation with democratic membership open to the local community. The majority of directors are elected from local community members, although there may in addition be some appointed directors.

Community-led partnership: Partial local democratic control. While locally elected directors will be the largest single group on the board, there are a significant number of appointees.

Agency-led partnership: A group where there is agency control over the agenda and management board, but where there is an element of local democratic representation.

No control: This includes consultation and informal arrangements

Over 85% of groups identified themselves as under either 'community control' or 'community-led partnership'. The significant number of groups self-defined as having 'no control' may reflect ambiguity in the definition, and the fluid nature of institutional arrangements in some groups, perhaps those that are recently formed.

INDICATOR 27: HECTARES OF WOODLAND MANAGED BY COMMUNITY WOODLAND GROUPS

The F4P Survey of Activities asked community woodland groups to record the number of woodlands that they own or manage, and, for each one, to record the number of hectares, and its legal status according to six different categories, described below. The total number of woodlands managed by the 138 community woodland groups is estimated to be 250. The total number of hectares is estimated to be 18,275. Both figures have used conservative assumptions when rating up from the sample obtained. In comparison, CJC Consulting (2006) report that the 57 groups that were on the CWA database at the time were involved in the management of 18,091 hectares.

From the F4P Survey, the percentage of total hectares under community woodland group influence for each of six different categories of legal status is estimated in Table 43.

The legal status categories are based on those used by MacIntyre (2002), as follows:

Ownership: The Community Woodland Group, or appointed representative, has the legal holding of title to the land and, typically, the trees growing on it.

Lease: A legally binding agreement between a Community Woodland Group and the woodland owner (or their managing agent). It stipulates the area of land subject to the agreement, the duration of the agreement, and the rights and restrictions conferred on the Group with regard to the woodland for the duration of the agreement.

Management Agreement: A formalised mutual understanding between the Community Woodland Group, the woodland owner or their management agent, and possibly another interested third party. This understanding is usually described in a document, agreed to by all parties, which identifies management objectives for the woodland, and prescriptions for specific management requirements and other activities, as well as the body(ies) responsible for carrying out (or ensuring that the activities are performed). The Community Woodland Group may be identified as the lead organisation, or as an active management partner organisation.

Informal Agreement: Such an arrangement does not include any of the mechanisms mentioned above for the formalisation of the group's involvement with the woodland. By its nature it is usually a verbal understanding between the group and the owner or their managing agent. The level of a group's involvement with the woodland can vary significantly within this framework and can range from direct participation in management planning and management operations to access to the woodland for a particular purpose.

Table 43. Legal status of woodland under management influence of community woodland groups in Scotland¹¹³

Legal status	Percentage of total hectares managed (weighted)	Estimated number of woodlands	Area of woodland (ha)
Ownership	44	88	8,100
Lease	2	22	450
Management agreement with FCS	12	31	2,250
Management agreement with other organisation (not FCS)	0	6	25
Informal agreement with FCS	20	3	3,650
Informal agreement with other organisation (not FCS)	10	18	1,750
Unknown (no response)	11	82	2,050
Total	100	250	18,275

Source: F4P Survey of Activities (2007)

These data can be compared with previous work by CJC Consulting (2006), given in Table 44, who use the 57 groups recorded on the CWA database at that time, and using slightly different terms to those defined by MacIntyre (2002). Here it may be assumed that 'partnership' equates to 'management agreement', and 'other' equates to 'informal agreement'.

Table 44. Forms of tenure of CWA members¹¹⁴

Form of tenure	Number of woodlands	Area of woodland (ha)
Ownership	21	3,391
Ownership/lease	3	1,261
Lease	5	732
Lease/partnership	2	2,100
Partnership with FCS	10	6,571
Other	16	4,036
Total	57	18,091

Source: CJC Consulting (2006)

¹¹³ Note that the data given in Table 43 was collected for each wood, while the data on community involvement given in Table 42 was collected for each community woodland group. For this reason it is not possible to cross-reference to two datasets.

¹¹⁴ CWA data at October 2006.

INDICATOR 28: INCOME OF COMMUNITY WOODLAND GROUPS

The total annual income of all 138 community woodland groups is estimated from the sample of respondents, using the same conservative assumptions as with numbers of members and hectares, to be £4,474,000. This total is separated into the sources of income given in Table 45.

Table 45. Sources of income to community woodland groups

Source of income	Total income (£m)	Percentage of total income (weighted)
Grants from public bodies	2.2	50
Donations from private or charitable organisations and individuals	0.7	17
Membership fees	0.4	10
Sales (forest products)	0.3	6
Sales (other goods and services)	0.3	6
Other	0.5	11
Total	4.5	100

Source: F4P Survey of Activities (2007)

Grant recipients were asked the average percentage of income in 2006 that was core funding (i.e. not tied to specific projects). The results are given in Table 46, grouped into six percentage classes.

Table 46. Percentage of groups, by % of income in 2006 that was core funding

Percentage of income that was core funding	Percentage of all groups (weighted)
0	39
1-20	20
21-40	2
41-60	11
61-80	2
81-100	26
Total	100

Source: F4P Survey of Activities (2007)

The scale of funding that groups were seeking to obtain in total for the following three years is given in Table 47, according to four classes for level of funding. Respondents were also asked to estimate the percentage of this stated funding requirement for the next three years that had been secured to date. The percentage secured by groups at each funding level is also given in Table 47. The average percentage secured, weighted for all groups, was 29%.

Table 47. Scale of funding sought for the next three years, and percentage secured to date, by community woodland groups

Level of funding sought	Percentage of all groups	Percentage secured to date (weighted)
£0 - £10,000	39	23
£11,000 - £20,000	10	23
£21,000 - £50,000	13	63
More than £50,000	38	17
Total	100	Average = 29%

Source: F4P Survey of Activities (2007).

INDICATOR 29: NUMBER OF PEOPLE INVOLVED IN, OR CONSULTED ABOUT, FORESTRY PLANS

The F4P Omnibus Survey 2006 asked participants about their involvement in a range of activities associated with F4P in order to provide insight into the level of involvement of the Scottish people in decision-making about forestry plans. The results of the question are presented in Table 48 together with an extrapolation from the data to the adult Scottish population to derive an estimate of the number of adults that may be involved in those activities.

Table 48. Participant responses to the question, “During the past 12 months, which of the following activities, if any, have you been involved in?”

Type of Activity	Percentage of participants
Become or are a member of a community based woodland group such as a ‘Community Trust’ or ‘Friends of Group’	0.7
Been involved in voluntary work in connection with a woodland e.g. physical work in the wood, administration, fund raising, running a group	1.4
Been involved in an organised tree planting event	1.9
Been involved in or consulted about plans for creating/managing or using woodlands in your area	2.2
Been or are a member of an environmental organisation	2.5
None	89.5
Don't know	3.5

Source: F4P Omnibus Survey (2006)

The Table shows that an estimated 2.2% of adults were involved in, or consulted about, plans for a woodland in their local area in the previous 12 months. A total of 8.7% had been involved in one or more of these ‘community capacity’ activities. Respondents were able to make multiple responses to the question in the survey so it is not possible to sum the numbers for different activities.

This compares with data from the Scottish Household Survey (SHS) for 2001/02 (Hope *et al.*, 2003) in which participants were asked to state their level of involvement in their local community. This study estimated that 26% of the Scottish adult population regard themselves as being involved ‘a great deal’ or ‘a fair amount’ in their local community.

INDICATOR 30: PUBLIC PERCEPTIONS OF THE COMMUNITY CAPACITY BENEFITS OF FORESTS

This indicator measures public perceptions of the benefits of forests and woodlands for enhancing aspects of community capacity broadly defined to include social connectedness, and social norms such as trust, friendship and reciprocity. The latter two terms (connectedness and norms) are the two elements typically associated with the notion of ‘social capital, which captures the idea that social bonds and social norms are an important basis for positive, collective action. Pretty and Ward (2001) explore the distinctions between these two broad sub-categories of social capital. For them, social bonds refer to the many possible types of connection and linkage between groups and individuals, while the normative features of social capital are evidenced by relations of trust, reciprocal

arrangements and commonly recognised rules and sanctions which place group interests above those of individuals.

Proxy estimates of the extent of social bonds that can be attributed to social forestry activities are provided by Indicator 26, while the total area of woodland managed by community woodland groups (Indicator 27) gives a spatial dimension. Measuring the extent of the social norms associated with social capital is not straightforward. Data can be gathered using social surveys, but the subject matter is complex and multi-faceted, requiring questions about attitudes, emotions and values which are difficult to address through this medium. Questions can be long and complicated and, due to the lack of any established reference, the resulting analysis does not easily convert into a reliable measure of 'high' or 'low' social capital.

A useful example, however, is provided by a question that was included in the Scottish Household Survey (2000/01) with the aim of assessing the level of help and support that people feel they can access within their neighbourhoods and communities. Respondents were asked to state their level of agreement with three statements. Table 49 presents the proportion of adults who tended to agree or strongly agree with each statement.

Table 49. Proportion of adults who strongly agree or tend to agree with the three quoted statements on neighbourhood support, 2000 and 2001

Statement	Percentage of adult population who agreed or strongly agreed
"If I was alone and needed help, I could rely on one of my friends or relatives in the neighbourhood to help me"	89
"If my home was empty, I could count on one of my friends or relatives to keep an eye on my home"	91
"I feel I could turn to friends or relatives in this neighbourhood for advice and support"	85

Source: Scottish Household Survey 2000/01 (Hope *et al.*, 2003). Base = 29,120

Overall, some 88% of people said that they could turn to friends or relatives in their neighbourhood for some kind of help and support. These data provide some indication of the prevailing level of trust within Scottish communities.

The F4P Omnibus Survey 2006 measured the extent of the social norms associated with forest-related participatory and community activities. Respondents who said they had been involved in one of the activities shown in Table 48 (for Indicator 29) were asked whether they associated feelings of 'friendship', 'trust', and a 'sense of belonging' with those activities. Friendship and trust, which are two of the key social norms associated with social capital, were associated with these community activities by 17% and 13% of these respondents respectively. A 'sense of belonging', another important attitudinal component of social capital was related to the activities by 42% of respondents.

Additional data on public perceptions towards the contribution of forests and woodlands to community capacity is available from the F4P Omnibus Survey 2006, which asked Scottish adults whether woodlands are good place to meet with friends and family. 49% agreed with this statement, and 16% strongly agreed. More women (68%) agreed or strongly agreed with this statement than men (62%), possibly because women use woods more for social activities than men. The 35-54 and 55+ years age groups were more likely to agree or strongly agree with the statement than the younger age group (see Figure 16).

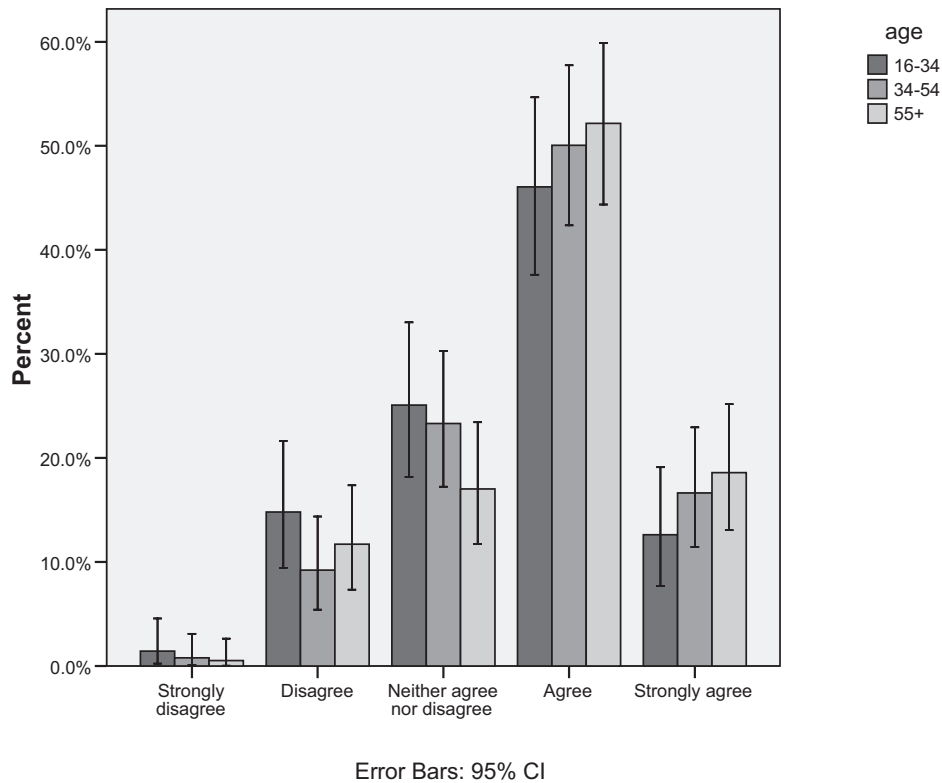


Figure 16. Percentage of respondents who perceived woodlands to be good places to meet with friends and families, by age class

When Scottish adults were asked whether it was important to have a say in what happens in your local woodland, 57% agreed and 26% strongly agreed with this statement. The 16-34 age group were less likely to agree or strongly agree (79%) than the 35-54 (85%) or 55+ (84%) age groups. In the UK Public Opinion Survey of Forestry 2007, 54% of Scottish respondents agreed and 33% strongly agreed with the same statement.

Related data is available from the Greenspace Scotland Omnibus Survey 2007 which asked Scottish adults whether greenspaces should be good places for people to meet others from their local community, and 69% strongly agreed while 21% slightly agreed. When asked whether their local greenspace was a good place to meet others from their local community, 41% strongly agreed and 27% slightly agreed. These data highlight a mismatch between what people would like and their local experiences.

SECTION 3: INSIGHTS FROM THE CASE STUDIES

3.1 INTRODUCTION

KEY FINDINGS

On the basis of case study research in the Loch Ness and Glasgow and Clyde Valley regions, the range of benefits to the people of Scotland includes the following:

- Employment and volunteering opportunities provided by forest-related organisations and initiatives, and due to visits to the region associated with forests and woodland.
- Contributions to local economies due to forest-related employment and visitor spending.
- Increased human capital and hence employability of individuals who participate in forest-related initiatives and activities, through educational attainment, training and skills development, and life skills such as teamwork and leadership.
- Fun, happiness and well-being.
- Raised awareness and understanding of the natural environment of residents and visitors through connections with nature.
- A sense of civic responsibility for, and ownership of, local natural resources.
- Positive reinforcement of good behaviour among young people and associated increases in capacity for learning.
- Improvements to mental and physical health associated with outdoor activity and associated healthy lifestyles.
- Stress reduction and other emotional and mental health improvements due to woodland visits and woodland views, and due to associated social interaction with friends and family.
- Stronger sense of identity and belonging associated with particular wooded landscapes.
- Increased social inclusion and community cohesion associated with shared experiences of forests through visits, or volunteering and employment, associated with forests.
- Increased community capacity to achieve shared goals, through increased 'bonding' social capital (i.e. within communities), and 'bridging' social capital (i.e. between members of communities and external partners).

The multiple benefits derived from any one 'forestry for people' initiative were present across the seven themes used to structure this research. Thus, livelihood benefits are derived principally as a result of the planning and delivery of other 'forestry for people' initiatives. Similarly, activities that are organised to provide learning and education, for example, may also indirectly provide a wide range of other benefits, such as health and well-being, or recreational opportunities.

There is good evidence from the case studies to show that 'forest-related initiatives targeting individuals and communities in both case study locations confront a range of local development issues and needs, and hence address a number of key government agendas.

The most striking finding was the evidence of a substantial increase in the scale and extent of partnership-working between agencies, both within and beyond the forestry sector at different spatial scales and levels of governance. In contrast to the 1990s, partnerships are now a fundamental feature of contemporary 'forestry for people' activity in Scotland, reflecting a new, outward-facing and collaborative dynamic that is having a positive effect on community development and the generation of public goods.

BACKGROUND

This section reports the major findings of the case study research. The primary objective was to complement the national-level thematic valuation given in Section 2 with detailed, context-specific assessments of forest-related benefits as they accrue to the resident populations of two selected regions of Scotland. These detailed assessments were achieved by directly finding and reporting stakeholders' experiences of and involvement in 'Forestry for People' activities. This was regarded from the outset as an important component of the project, because it provided a mechanism for the inclusion of stakeholder accounts and perceptions into the overall analysis, bringing a level of insight, detail and colour that would not have been possible through a national-level perspective alone.

The location of the case studies and an overview of the research brief and methodology is given below. Sub-section 3.2 gives a description and analysis of benefit types in the two case study locations. An analysis of important developmental impacts of 'Forestry for People' activities, highlighting ways in which these are helping communities and individuals to address specific development needs and issues in their respective regions is given in Sub-section 3.3. A key finding of the case study research, namely the increasing importance of partnership working in the delivery of 'Forestry for People' benefits is given in sub-section 3.4. Evidence of its increasing role in both case studies is presented, leading to a proposed refinement of how community forestry is defined in Scotland.

THE CASE STUDIES: LOCATION, RESEARCH BRIEF AND METHODOLOGY

The regions selected for case study research were Glasgow and Clyde Valley and Loch Ness. These distinct regions, one located in one of the most urban parts of Scotland, the other in the rural Highlands, were selected to capture some of the diversity of the forest and woodland experience in Scotland.

Cardiff University was awarded the contract to carry out the research in both case study regions, and their research is reported in full in Evans and Franklin (2008). The overall brief was to: 'examine and describe the nature and extent of 'Forestry for People' benefits accruing to residents in two case study areas, and to analyse the relationship between benefit types'. The brief was structured around two principal research phases (see also Section 1).

Phase One

The purpose of Phase One was to conduct an extensive profile of each case study region in order to provide a working knowledge-base from which a subsequent, more targeted, research phase could be designed and implemented. An important function of this profiling work was the selection of key locations within each case study to carry out this targeted research. This started with a brief overview of available data on 'Forestry for People'

activities that are taking place in the two case study regions, enabling the selection of sub-regions.

For Loch Ness, this revealed three sub-regions characterised by distinctive 'Forestry for People' activities (see Figure 17). Thus, the north shore of the Loch can be said to be characterised by community development activities, including a community enterprise development initiative to take advantage of the opportunities provided by a new 'experience economy' (Pine and Gilmore, 1999) that is becoming common in the Highlands region. The south shore of the Loch is characterised by both commercial and estate forestry, and well-established approaches to public amenity provision. The Fort Augustus area offers the opportunity to examine how social benefits of a forest location are being captured by the community of a small rural village.

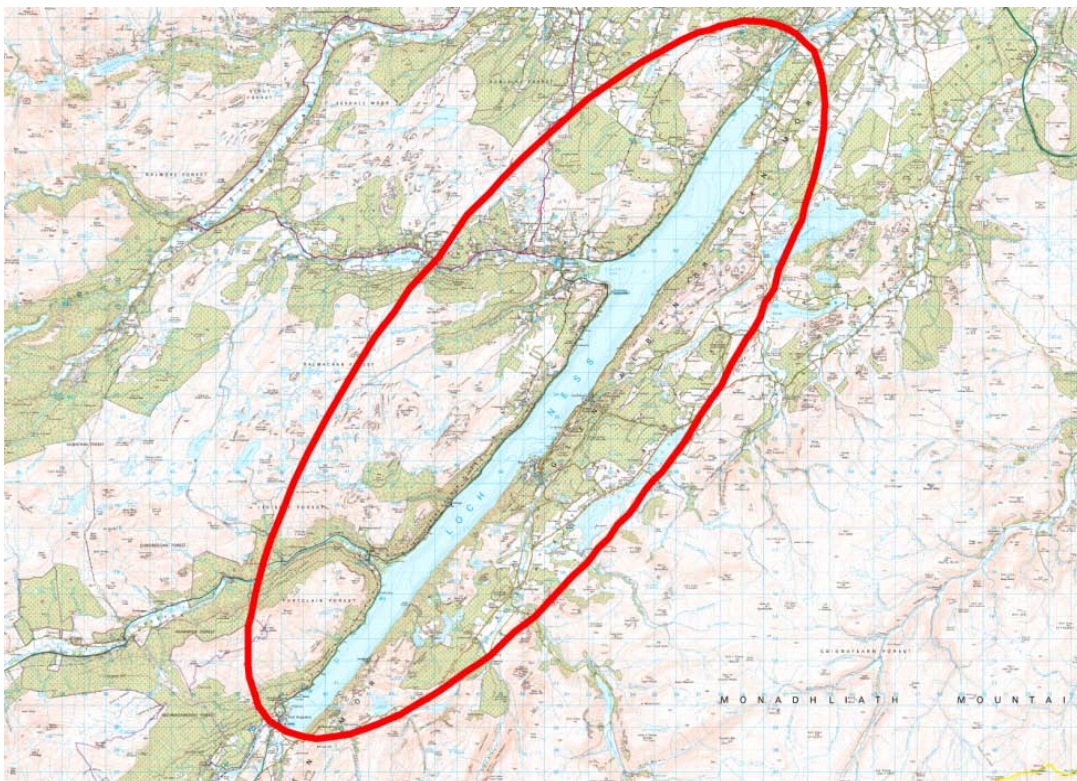


Figure 17: The Loch Ness case study region

An overview of data available for the Glasgow and Clyde Valley region enabled the selection of three sub-regions, all of which are located within the City of Glasgow Local Authority (see Figure 18). The selection of these smaller sub-regions was necessary because of the dense population of Glasgow, where an area equivalent in size to the Loch Ness region would have covered a population of many hundreds of thousands of people. Thus, there was a need to focus on a specific number of 'data-rich' communities, which would provide the most useful and interesting insights into the social benefits of forestry in an urban context.

Two of the selected case study localities are residential communities: Drumchapel, which is situated to the north-west of the city centre, and Castlemilk, which is to the south-east. The third locality is Pollock Park, a greenspace situated just south of the city centre (see Figure 18). Drumchapel is located in the Drumchapel/Annieisland Ward of Glasgow City Council/CPP and borders the districts of Bearsden and Milngavie. Pollock Park is located at the boundaries of Pollock and East Pollockshields Wards. Castlemilk is located within the

Langside and Linn Ward and is bordered by the communities of Cathcart, King's Park, Langside, Mount Florida, Carmunnock and Glen Wood.

The characteristics of the three sub-regions reflects three nodes of activity of particular relevance to the case study brief. In Drumchapel, there are a number of important Woodlands In and Around Towns (WIAT) schemes focused upon the Drumchapel housing estate area. There is also a Forest School initiative and a number of health initiatives. Pollock Park, in the central area, is a greenspace resource with significant tree cover (over half of the total Park area is covered by mature broadleaved woodlands). The Park hosts a number of innovative schemes and initiatives, including the Glasgow Forest Education Initiative. In addition, the Park is used by a number of initiatives which target communities in both Drumchapel and Castlemilk. Finally, the Castlemilk housing estate area is the focus for a number of forest-based community projects, WIAT projects and volunteer schemes.

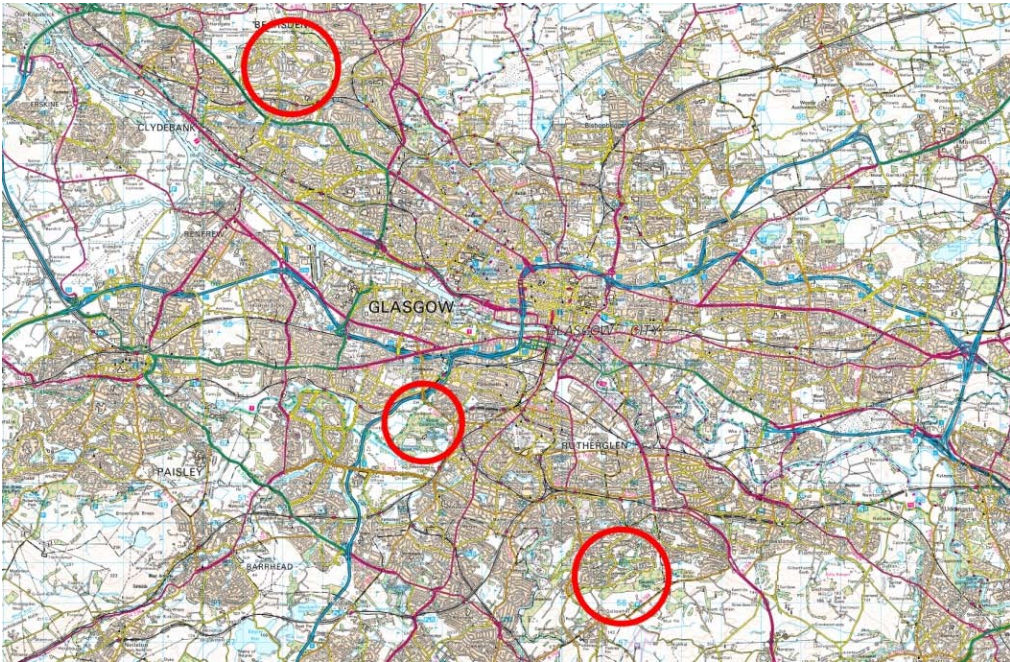


Figure 18: The Glasgow and Clyde Valley case study region with selected sub-regions

Following the initial profiling phase, the selected sub-regions were then subjected to more detailed profiling work, involving desk-based research (including internet searches and email correspondence) and some 'scoping' interviews (mostly by telephone) with key stakeholders. In addition, available socio-economic statistical data was gathered to present background information, including data relating to employment, deprivation, and social groupings. Also, a wide range of organisations, institutions, partnerships, voluntary organisations and other groups were canvassed in order to gain an overview of the 'Forestry for People' activities taking place.

The resulting profile reports contain the following information:

- data relating to forest cover and forest management types
- available background socio-economic data
- information about community-based, forest-related activities and projects
- information about relevant forestry sector projects, partnerships and initiatives
- a stakeholder analysis, mapping the relationships between key individuals and organisations and presenting a database of contact details

Phase Two

The initial profiling phase provided an overview of uses and community members who gain socio-economic and cultural benefits from forests and forest-based activities in the two case study regions. However, in order to understand the nature of the benefits they enjoy, the motivations that drive them, and the ways in which they enact their enjoyment, use, and appropriation of these benefits, a period of intensive fieldwork was required to study and analyse the experiences of 'Forestry for People' deliverers and beneficiaries. This intensive fieldwork constituted Phase Two of the case study research. Accordingly, specific locations, groups, activities and their corresponding benefit types were selected for detailed investigation. Participant observation techniques were used to investigate activities, projects and specific landscape variables. Focus groups and group interviews were used to investigate group and collective values, motivations and benefits. In addition, some semi-structured interviews were used to gather in-depth knowledge from key respondents.

In Loch Ness, Phase Two involved an initial 'reconnaissance' trip. Evidence was gathered through scoping interviews, participant observation and photography in order to confirm information discovered during the profile and to plan and target future research activities. During subsequent fieldwork trips, in-depth interviews were conducted with 14 key respondents. In addition, one expert group discussion and two focus groups were convened. Visits were also made to five significant sites and two events were attended. Site visits involved additional informal interviews with visitors. In total, 27 interviews were conducted.

In Glasgow, initial reconnaissance produced photographic evidence of deprivation and of community activities in the woodlands. Subsequently, in-depth interviews were conducted with 14 key respondents and three focus groups were convened. Three woodland-based events were attended in addition to one Forest School class. A visit was also made to one school to run a research workshop and some interviews with children from the Forest School class. Five site visits were made to Pollock Park, and other visits were made to four other woodland sites. Three meetings of the Glasgow Forest Education Initiative were attended. In total, 30 interviews were conducted.

3.2 THEMATIC ANALYSIS

BACKGROUND

In this sub-section, the results of the description and analysis of themes in the two case study locations are reported. The treatment of themes as separate from one another does not always provide an accurate account of how F4P benefits are either delivered or experienced. However, because these themes have thus far provided an over-arching scheme of enquiry for the F4P project and a structure for this report, it is helpful to maintain this thematic structure for the purposes of this sub-section, which presents a compendium of case study findings. Also, the initiatives, programmes and projects discussed often do have a thematic focus or emphasis that can be used to characterise and categorise them, even if their wider outcomes are likely to be cross-thematic.

The F4P themes 'employment and volunteering' and 'contribution to the economy' are discussed together below under the heading 'livelihoods'. They were considered separately in Section 2 due to the large amount of new information and data that was being presented on these two topics.

1. LIVELIHOODS

As discussed above, there are close connections between types of social benefit accruing to people involved in F4P activities. The livelihoods theme is the one most connected to other the other themes. To some extent, livelihood benefits at a local level are derived indirectly through the creation and delivery of activities and benefits that lie within the other F4P themes, such as health and well-being, recreation or culture. This is particularly the case in Glasgow and Clyde Valley, where more traditional forest-related livelihood benefits - those derived from activities such as forest maintenance and felling, are less relevant to an urban forestry context.

Livelihoods in the Loch Ness region

In the past, complaints about the use of outside specialist harvesting and processing contractors came to typify local attitudes towards large-scale forestry. In Loch Ness, however, there is a new and growing sector of forest professionals who are managing forest stands for multiple uses, such as biodiversity, recreation and community activities, and whose activities are having a significant local livelihoods and employment generation effect. As one Forest Enterprise Scotland employee expresses it:

"We haven't mentioned local productivity and small business development based on forest outputs, apart from tourism, which has got to be the biggest economic activity. But there is the sort of direct employment potential from forest products, which historically has been FC employment, but is now much more widespread in terms of freelance or self-employed timber contractors. But nowadays that is increasingly likely to be more diverse than it has ever been in the past... instead of being a specialist with a narrow range of skills, they are now more generally skilled in lots of different forest operations."

Similarly, a small number of younger foresters, who were originally involved in various community woodlands, have set up independent consultancies, servicing forest management contracts on behalf of private and community woodlot owners. The Abriachan Forest Trust (AFT), for example, had a young forester on its Board during its early days, who has now set up a forestry consultancy which specialises in the community woodlands sector.

Small-scale timber producers have been present in the area for many years, and many became associated with Highland Birchwoods, which was originally formed in 1992 as a clearing-house for small, high quality timber and timber-product producers. They are able to support small-scale timber-based livelihoods with consultancy services and, recently, have also been channelling European Social Funds into the sector.

At the level of quality production of goods from local timber, there is reported to be:

“... an increasing number of local processors with mobile benches, taking less special material, more ordinary material, but turning it into a value added product. We are also conscious of the fact of the benefit to sustainability, because of timber miles associated with local processing...” (FES officer).

Another sector which is growing rapidly and which has an important livelihoods impact is the provision of fire-wood, or bioenergy from small woodlot producers and community woodlands. Examples of small-scale energy forestry are found within the AFT, which sells firewood from its website to help fund its operations, and Highland Birchwood, which also supports a bioenergy initiative.

Livelihoods and recreation

In recent years, the increase in forest-based outdoor recreation and tourism has created new livelihoods opportunities for the resident population, with many taking advantage of the significant contribution that forests make to the scenic beauty of the region. To a certain extent, forest-based recreation and tourism providers are contributing to a re-branding of the Loch Ness area as a visitor destination that is not exclusively focused on the loch itself, but as an area which contains a wider countryside resource with a wealth of recreation opportunities. An example of this is the development and publicity of the Great Glen Way, which brings many walkers and cyclists to the area. The emergence of a B&B Providers Association in Drumnadrochit is also evidence of a growing visitor interest in the wider Loch Ness area.

There are examples of a prominent forestry component to these developments:

- FC investment in mountain biking trails in the lower Loch Ness Fort Augustus area has been successful in drawing in visitors, increasing visitor numbers and the tourist spend and contributing to a positive outlook among many tourism providers (FCS, 2007d).
- Forest-based recreation in Loch Ness is increasing as a result of key partnerships between FC, Highland Council, and local community groups. Examples are The Great Glen Way Partnership and the Loch Ness Partnership, which have resulted in a number of new outdoor recreation events and programmes, supporting a ranger and other jobs, and contributing towards an increase in tourist spend.

Livelihoods and community capacity

As is the case for many community woodlands across Scotland, the Abriachan Forest Trust (AFT) in Loch Ness has undergone a change in the emphasis of its activities away from land acquisition, environmental improvements and investment in equipment, towards developing new livelihood opportunities both for immediate and wider communities. The Trust is now looking to maximise the local job creation potential of its forest resources. For example, when interviewed for this project, plans were underway to create a paid post for one individual at AFT who, until then, had been working on a voluntary basis delivering education services.

The ability to capture the community development potential of human capital built up as a result of forest-related activities is closely linked to the social capital within the Trust and within the many partnerships in which it carries out its work. Whether with organisations such as Scottish Natural Heritage, where partnership money supports species replacement, or with local service providers who can access capital funds for the development of assets such as the all-access path, the proliferation of this partnership working is seen by many within the AFT as a key factor in their success in maximising the employment and livelihoods potential of community members.

The case study findings suggest that the livelihood and employment benefits flowing from partnerships between community woodlands, other woodland owners and the public sector are an important contribution to the local economy. For example, within environmental and forest management, the AFT has delivered 16,700 tonnes of timber harvested to the CSC/Nexfor factory for pulp in orientated strand board manufacture, cleared 86.5 ha of exotic tree species, and planted 107 ha in native tree species (Campbell Consulting, 2004). Furthermore, physical forest improvement works have been required to maximise the tourism and recreation potential of the woodlands, involving activities such as path building and maintenance, forest improvement, and the construction of visitor facilities. Activities of this type indicate that livelihoods and employment benefits are being generated in the region.

Livelihoods and culture

Several artists have moved into the area and some have set up studios and galleries. Those artists who base their work around the use of forest spaces and forest products are a small, but significant subset of this community, and forest-based activities do make an important contribution to their livelihoods and the livelihoods of those who support and exhibit their work. Similarly, there are people who work in the performance arts and art education sectors whose livelihoods are supported through the direct and indirect use of forest and woodland.

Forests are also used increasingly as a setting for cultural events, such as Rock Ness near Foyers, Hogmanay with Runrig in Drumnadrochit, and the Beladrum Festival on the Loch shore. These events bring large numbers of young people into the local region and generate exposure for the area in the national media as well as revenue for local businesses. Although managed by businesses located elsewhere in the UK, the provision of supplies, skills and labour often comes from local sources. Respondents in the development sector noted the events' successes as important new sources of publicity, revenue-generation and local employment.

Livelihoods in the Glasgow and Clyde Valley region

Research in the Glasgow and Clyde Valley case study discovered a growing sector of social entrepreneurship delivering a range of forest-related social benefits, but centred around the provision of livelihood opportunities. Within this entrepreneurial context there is a growing focus on the economic and social regeneration of local communities, tackling social exclusion and deprivation, and driving the development of community capacity. Many of the

activities geared towards this regeneration effort provide a context for employment. Often, forest-related projects and initiatives involve training in practical and physical skills, which are often missing in the modern urban-based economy, and which impart a sense of 'doing something real', which proved to be significant for many respondents. The 'real' activities and the attainment of skills required to deliver urban-based, forest-related, social and economic regeneration are helping to bring socially excluded individuals back into employment and, therefore, back into mainstream society.

Two important examples are provided by the case study research:

- The GalGael Trust, based in Govan, organises projects using donated timber and forest materials to make boats and other timber products. Staff and members are involved in the harvesting and transport of the materials. The Trust recently negotiated woodland management agreements with several woodlots, and will be adding woodland maintenance skills to the training portfolio they offer participants. The training offered by the Trust is designed to provide a route back into employment, through the attainment of forestry-related and carpentry skills. Significantly, the work of the Trust represents an exciting contrast to the usual trajectory of moving forestry-based jobs out of the city. In the words of one respondent:

"We don't just re-connect the city and countryside, we want to bring the countryside back into the city" (Trainer, GalGael Trust, Glasgow).

- Greenwork Mates, based in Drumchapel, is a volunteer training programme funded by Glasgow West Regeneration Agency (GWRA) and managed by FC. It aims to re-integrate those on disability benefit and the long-term unemployed back into the workplace. Clients are referred from the Scottish Association for Mental Health (Glasgow North Training) and GWRA (West Referral Team, STAR Partnership, Work and Job Gains Team) (Assenti Research, 2007). Participants take part in woodland-based activities in the local community woodland and are trained in key ranger skills. At the time of a graduation ceremony in November 2007, two participants had gained both the skills and the confidence to apply for permanent ranger positions. The following quotations, taken from interviews with Greenwork Mates participants, indicate the positive impact that the project is having:

"Greenwork Mates has... enabled me to become a more confident and hard working individual. I have been trained in various courses such as Walk Leader, qualified to take out the local Leg-it walking group. I passed my Emergency First Aid with St Andrews Ambulance Service and also passed my Leadership Skills Course at the Scottish Agriculture College in Ayr with BTCV who were the facilitators. Also I was trained by Hessilhead Wildlife Rescue Trust in Emergency Wildlife First Aid... The benefits to the participants of this course is that they have become healthier emotionally, mentally and physically, enabling us to live brighter, happier lives."

"It's so long since I worked and I've changed so much that I had forgotten that I actually quite like taking charge of a situation so it was wonderful to re-discover that."

"I never spoke at all to start. I could get really angry if someone tried to tell me to do something but I don't know why it's different now, we all just get on."

Livelihoods and education

Forests and woodlands feature prominently in the regional education sector, with important consequences for livelihoods and employment. Upwards of 80 teachers, for example, have taken Forest Teacher certification as part of the Glasgow Forest Education Initiative (GFEI). The GFEI is a partnership between the City of Glasgow (through its Countryside Rangers Service), FCS and the local education authority. A Community Officer from FES Central Conservancy and a Countryside Ranger work with staff from special needs schools, technology teachers, arts workers, and the head of the Glasgow Eco-Schools initiative to make resources and training available to all teaching staff in the area. Most importantly, the initiative has delivered a forest teacher training certification to local teachers, as well as training trainers to set up a cascade certification system. Forest education opportunities are also publicised throughout the education system through the work of the initiative, helping to increase as well as satisfy demand. Through the GFEI alone, forests and woodlands have contributed significantly to the livelihood opportunities of many working in the education sector in the Glasgow and Clyde Valley region.

Livelihoods and health

The Health Department of the Scottish Government, through its National Strategy for Physical Health, delivers a partnership working strategy which fosters collaboration between health care providers and managers of greenspace as a means of tackling health conditions which respond positively to outdoor activity. In Glasgow a number of Community Health and Care Partnerships (CHCPs) have been set up, including one in the south-east of Glasgow which covers the Castlemilk study area. These partnerships are directly responsible for woodland-based walking programmes such as Castlemilk's 'Branching Out'. The programmes involve health professionals and volunteer walk leaders, including those trained and insured by the Paths-for-All and Paths to Health initiatives.

One result of these initiatives is a marked increase in training opportunities for health professionals, forest rangers, community development officers, and workers within the social care sector. Many of these programmes are in their early stages of development, and this is reflected in the low incidence of direct employment opportunities. However, the enthusiasm and entrepreneurial verve shown by the leaders in the sector, interviewed as part of the case study research, suggests that this field of activity has the potential to grow substantially.

Livelihoods and recreation

In the Glasgow and Clyde Valley region a proportion of the public and private sector employment effect of formal recreation can be attributed to the use of forests and woodland. An example of public sector employment can be seen in the City of Glasgow Parks and Recreation Department, which employs rangers and maintenance staff to support recreation. In the private sector, modern innovations such as the "Go Ape" Challenge Centre can create recreation-based employment and livelihoods opportunities. Informal recreation takes place in all the forests and woodlands within the case study region. Although informal recreation is not directly connected to the livelihoods generated by formal woodlands programmes, there is a component of it which does contribute to the employment of people who maintain the paths and woodlands.

Recreation therefore, drives two types of jobs: those delivering or managing programmes and initiatives, and those which maintain the land resource on which they take place. In Pollock Park, for example, the delivery of recreation programmes and projects is managed by the Countryside Ranger Service. In terms of site management, the park itself employs a much larger number of maintenance staff. In Drumchapel and Castlemilk there is a strong volunteer base for path maintenance, brashing and planting. The work is unpaid, but there

are training opportunities which have led to employment for some participants. However, the management and co-ordination of this volunteer resource provides a growing employment opportunity.

Livelihoods and culture

Some livelihood opportunities come from the use of forests and woodlands for various cultural activities and practices. The use of forest environments for art provide a livelihood for a number of individuals. Two members of the GFEI, for example, coordinate artistic activities making artifacts from forest materials and running craft classes. Both are regularly contracted by the recreation and education departments of the local government to run craft workshops using 'forest found materials' in various locations across the city.

Livelihoods and community capacity

The multitude of newly-formed partnerships which use forests and woodlands to drive social and economic regeneration are having an important employment effect in the Glasgow and Clyde Valley region. This employment effect is concentrated in, but not limited to, the community development sector. In Drumchapel and Castlemilk, for example, there has been a marked increase in numbers of community development officers employed as a result of partnerships between the City of Glasgow, local communities, and delivery partners such as the FC, Greenspace Scotland, local greenspace trusts, Community Health and Care Partnerships and Scottish Natural Heritage.

Interviews with a number of community development officers working in the region revealed a high level of enthusiasm and entrepreneurial verve. Across the partnerships there is a strong sense of social enterprise directed towards the support of forest-based activities, and connecting sometimes unrelated sources of funding to make projects viable. This high level of activism and enterprise appears as a 'new social movement' that is focusing efforts upon maximising the community development effect of non-commercial uses of forests and woodlands. Furthermore, there is evidence to suggest that forests and woodlands act as the emotional and spiritual lifeblood of these social enterprises. One respondent explained how "we're just waking up to how people value the woodlands located directly around them in Glasgow".

It seems that many communities in the case study area are beginning to discover the multiple virtues in their woodlands. One of these is the delivery of multiple social benefits through the careful co-ordination of community forestry activities. The level of enthusiasm and experience observed suggests that the social benefits of forest-based activities will continue to develop, and with them the livelihoods opportunities associated with these activities.

2. LEARNING AND EDUCATION

The association between forests and learning is strong in both case study areas, where significant benefits are derived from both formal education and informal learning activities. Forest-based learning has intrinsic value as a benefit in its own right, but is also closely associated with the delivery and experience of other benefit types, particularly 'community capacity' and 'livelihoods'.

In Loch Ness, forest-based education and learning is an expanding sub-sector of 'Forestry for People' activity. The local education authority has a number of initiatives, which are

having important positive impacts on local education attainment, and which are extremely popular with both teachers and pupils. Education is also an expanding sub-sector of community woodland activity. For some community woodland groups, such as the Abriachan Forest Trust, the delivery of education and learning services is becoming a core delivery activity, providing important learning opportunities for local children and a vital source of operational income for the Trust.

There is also a vibrant forest and woodland education sector in Glasgow, with a number of key programmes, such as the Glasgow Forest Education Initiative. Education activities in forests and woodlands deliver a number of important benefits to young people and their teachers. In particular, forest spaces offer children from deprived urban areas the opportunity to connect with the natural environment and to participate in adventure play activities normally discouraged in a conventional educational environment. Forests and woodlands in Glasgow are also providing important learning opportunities for adults, particularly through forest-based volunteer schemes, which appear to be enhancing the employment prospects of some participants.

Education in the Loch Ness region

Across the Highlands, interest in using forests and woodlands as an education resource continues to increase. The local education authority has a number of forest-based education initiatives, including a Forest Education Initiative (FEI) project, a local Eco-Schools association, and a Highland Environment Network group, in which educators feature strongly. In the Loch Ness region, access to forests and woodlands is facilitated by these networks working closely with the community woodlands, and through the facilitation of the Highland Council Ranger Service, and the activities of Forest Enterprise Scotland and the Great Glen Way Partnership. The Highland Council Ranger Service offers a wide range of informal recreational learning opportunities in woodlands. Between 1 April and 30 September 2007 for example, working in partnership with 47 different groups, there were 65 events in the Loch Ness and Inverness area involving 1,967 people; 59 school education sessions involving 1,475 pupils; and approximately 200 adults at 35 sites around Loch Ness. Many of these events were held in a woodland setting.

There are two broad types of learning activity in the forests and woodlands around Loch Ness – formal and informal. Use of the outdoors for formal education is being led by the Curriculum for Excellence Programme (see sub-section 2.5). Community woodland group members interviewed during the research felt that this programme is likely to lead to increasing use of forests as learning spaces by secondary schools. Formal education also covers teacher training. There is a cascade training system beginning to be established, where forest classroom education skills are passed on to other teachers, widening access to forest-based learning across the formal education sector.

Formal forest-based education is seen to have an important role to play as a vehicle for social inclusion and community cohesion. The Highland Council, for example, runs a programme which works with ‘at-risk’ youth to give them opportunities to work and learn in a forest environment. A wider network of delivery partners dealing with ‘at-risk’ youth provide referrals to this programme. The ranger responsible claims that the programme is successful because it enables young people to take part in activities which challenge them physically and mentally and which teach them the value of teamwork, trust and mutual responsibility, while at the same time allowing them to see the immediate physical results of their work.

Informal learning in the form of interpretation and general knowledge of natural history and woodland environments is also an expanding sector. With the emphasis on lifelong learning

and related funding streams, ranger services in the region are increasingly taking the role of delivering extra-curricular education services. Furthermore, the expansion of outdoor recreation, and the related increase in demand for guiding and other leadership services, has created opportunities to acquire forest-based skills and knowledge that are attractive to young people in the region:

“... hanging on to young people is something we are all suffering from across the Highlands... I think, though, people like Abriachan are making a dent in that, because they can give people some hands-on experience in the forest and training” (Highland Council Ranger).

Informal forest-based learning is also making a positive contribution in terms of social inclusion, with a growing focus on using forest spaces in the area to engage those social groups with limited access to the education benefits of greenspace. One of Highland Council Ranger Service’s most successful programmes is directed at mother and toddler groups, targeting families from disadvantaged social groups. One group has been successfully established in the Foyers area, on the Foyers-Inverfarigaeg trail which accommodates baby buggies.

Abriachan Forest Trust: new spaces for learning

There is a strong presence of education specialists in community woodland development projects in the region and an equally strong discourse of development centred around the education of young people. For example, when it was first established, The Abriachan Forest Trust (AFT) included members with early childhood training and a qualified teacher on its board. Early in its development, the woodland was offered as an alternative space of learning to the children in the community’s primary school and the local secondary school in Drumnadrochit. Initially the Trust’s involvement in education were fairly specific:

“One off visits to a topic basically... and it was primary schools, and that was really what we did, we just tailored the topic [to their current interests]” (AFT member).

Agreements were put in place for small payments to the Trust in return for these services. Several years on these funds represented a significant and on-going operational income – something many community woodlands struggled to generate in a funding environment which was mainly focused on capital grants. This steady monthly income was core to building an economic model for community woodlands which was sustainable over a longer term. It gave the AFT on-going operational funds, and also it enabled continued investment in the development of educational spaces, culminating in the acquisition of capital funds to build a new ‘forest classroom’ in 2006. This space and the trails and other features in the woodland itself are now very well used to the point where there is potential to provide an income for a person who delivers the learning services. Thus, in the case of AFT, education was both a direct social benefit of forestry delivered to the wider community and a potential source of sustainable income for the Trust. In this sense, the Trust’s delivery of education services is moving away from being an informal, voluntary activity, and towards being a more mainstream, formal and professional service. The AFT is currently working to:

“professionalise education and other activities at AFT through being able to pay salaries – to, for example, receive funds to the Trust and hire people out of those funds” (AFT member).

The AFT is engaging with the social inclusion agenda, and is increasingly working with different age groups, groups with learning difficulties, young school leavers, and young people ‘at-risk’. A measure of the success of their work with children from local secondary schools is given by one respondent:

“The group from the High School is selected by guidance teachers. They are children that have needs

that are not coping in class. The last group that we had was a group that are in a practical class together, that bicker and fight in the class... and they have been out with us for Forest School and they are actually getting on... and you know, helping each other... and accepting the help from each other" (AFT member).

The examples provided by a number of research respondents supports the conclusion that learning and working in a forest environment can address some feelings of alienation and anomie that lie behind many young people's disengagement from education:

"So long as they are doing a job and they are seeing a job done, and they see that it is appreciated, they start, they take a sense of ownership. A label on a tree makes all the difference, you know, 'that's my tree" (AFT member).

In many cases, furthermore, young people's experiences, coupled with the formal recognition and qualifications that come in the form of education certificates and reports to referral organisations, can help to take them through the wider educational and institutional environment:

"Young people who are not attending school in any way... can go to their local authority social work reviews with a list of things that they have done" (AFT member).

Education in the Glasgow and Clyde Valley region

There is a vibrant and expanding forest education sector in the Glasgow and Clyde Valley region, driven by a number of principal actors, many of whom are passionate about the potential for forest-based learning. Using forest spaces for teaching and learning offers a range of benefits, including environmental education, the acquisition of practical skills, group working skills and knowledge of place. Forest-based learning in Glasgow has a particular value for engaging young children, for providing high quality teacher training and for imparting basic life skills that enable the long-term unemployed to re-enter the employment market.

As is the case in Loch Ness, there are two broad types forest-based learning in the Glasgow and Clyde Valley region: formal and informal. Formal learning involves the curriculum-based education services provided by the local education authority, and informal learning involves learning about forest spaces delivered to groups outside the formal education system.

Formal forest-based education is delivered principally by the Glasgow Forest Education Initiative (GFEI), working in partnership with the local education authority, Forest Enterprise Scotland, the City of Glasgow Countryside Rangers and the Glasgow Eco-Schools project. The Glasgow FEI provides materials and resources to support learning in the forest. It also applies for funds on behalf of individual teachers and schools and then distributes and manages these funds together, in some cases, with the learning materials the funds deliver. The Initiative also operates a cascade training system, whereby existing teachers are trained to deliver forest-based learning. A Community Officer from FCS Central Conservancy offers training to teachers and has co-ordinated various woodland education courses for Glasgow teachers in 2006/07 with 43 teachers and 19 'Active School' coordinators attending. A Forest School Leader training programme held in February 2008 attracted high interest: 24 applications and 16 places were awarded for this training. A Forest School 'taster' day was held in autumn 2007, which attracted 85 Glasgow teachers.

In terms of informal forest-based education, the City of Glasgow Countryside Rangers facilitate access to woodlands for numerous groups, coordinating a range of activities and events which have a learning component. Groups involved include Kelvin Green Space,

BTCV, Scouts, Soroptimist and Rotary Clubs, Grate Creative Arts Group, SENSE Scotland, Shawlands Academy Environment Group, Active Citizenship, participants in John Muir Awards, Scottish School of Herbal Medicine, Children's Nature Clubs, City of Glasgow 50+ Club, and the Glasgow Archaeological Group.

Forest classes with special needs students

The use of woodland spaces by special needs students is a growing sub-sector of forest-based education in Glasgow. Researchers attended and observed a class of second year secondary school students from the St. Joan of Arc Special Needs School, held in Pollock Park. The class was led by a Technology Studies teacher and a City of Glasgow Countryside Ranger.

The class observation revealed that, in addition to learning a range of practical skills such as identifying trees, the children's direct experience of a woodland environment had a positive influence on their behaviour in a number of important ways. Firstly, the setting meant that the children had plenty of space to play, and their sense of liberation from the tight confines of an indoor classroom was obvious. Secondly, the opportunity to engage in adventure play in a natural, relatively uncontrolled environment, meant that they took more responsibility for their own behaviour, understanding the risks involved and working together to play safely. There was much running back and forth, but with no one child getting too far from the group. Much excitement was generated by picking up branches and playing with them. The swinging of the sticks was done with a great sense of joy and liberation, and without aggression. All of the children reported that they loved the freedom to do this type of thing without getting into trouble. By being able to express more active behaviours, which would not be tolerated in the classroom, the children seemed better able to work together as a group.

One class activity involved a sensory challenge where children were paired off and one was blindfolded. Blindfolded children were led by their partners to a tree and were encouraged to touch the trunk of the tree in order to 'feel' and identify it. After being led away, the blindfold was removed and they were asked to find the tree they had just touched. This activity was particularly enjoyed, stimulating great enthusiasm and entertainment.

The teachers later confirmed that the forest classes offer the children opportunities for this kind of learning which they cannot get elsewhere. One teacher reported that, given the pupil's energy levels, forest-based learning situations gave more time on actual teaching and less on behaviour management than would be typical in a normal classroom environment.

3. HEALTH AND WELL-BEING

The need to increase levels of activity and fitness within the Scottish population is a key strategic policy of the Scottish Government and it has published a National Strategy for Physical Activity (Scottish Executive, 2003b). The Strategy states that: 'The health effects of an inactive life are serious. Inactivity accounts for over a third of deaths from heart disease and threatens the progress made in this area over many years. Added to this there is the disease, disability and poor mental health that come from growing levels of obesity and a lack of physical strength. Physical inactivity has been called the 'silent killer of our time' (Scottish Executive, 2003b).

Funding for projects aimed at increasing participation in healthy activity are supported by national and local health partnerships. StepitUp Highland, for example, resulted from Scottish Department of Health funding through the Paths to Health programme. Many local health authorities offer support for projects in woodland spaces and public health improvement is

emerging as an important 'virtue' which can be attached to an increasing number of forests and woodlands in Scotland. In the Loch Ness area the importance of health benefits of forests continues to grow in priority, with respondents from the Great Glen Way Partnership and the Highland Council rangers rating it amongst the most important benefits of their projects. In the Glasgow and Clyde Valley region health-based initiatives represent one of the fastest expanding sub-sectors of forest-related activity.

In addition to the physical and mental health benefits gained by those becoming involved in forest-based activities reported in each case study, the research highlights the important strategic and financial advantages for forestry organisations working in partnership with health organisations. There is a clear indication from discussions with Forest Enterprise Scotland and community woodland groups that public health delivery is emerging as a new and important source of opportunity and funding for the forestry sector in Scotland. In particular, respondents highlighted the fact that new, public health-related funding streams have arisen just at a time when funding support for more traditional community-based forest activities is beginning to cease, with important implications for the strategic direction of many groups.

Health and well-being in the Loch Ness region

There are two broad and related types of health benefits from forest-based activities in the Loch Ness area – physical health benefits through physical activity, and mental health benefits. The former accrue through the direct use of forests for physical activity, while mental health benefits are derived from the presence of trees and forests which can improve the prognoses of ill patients. In many cases, both needs are satisfied through walking in forest spaces. A key feature of the health benefits reported by respondents with a wide range of health needs is the value of social interaction that takes place as part of forest-based health initiatives. Many participants listed 'social interaction' as one of the top three most important benefits of walking in groups:

"Health-wise, fantastic; friendship-wise, even better" (Walking group participant).

StepitUp Highland, the Highland part of the Paths to Health programme, is a useful example of the health and related benefits that are delivered through organised, forest-based activities in the region. The initiative offers 30 minute walks in a variety of locations, led by a trained volunteer. In the case of the rural Highlands, it often includes transport to the walk site, which in the Loch Ness region is usually a forest or woodland. Across the study area there are approximately seven weekly led walks in woodlands.

The primary purpose of the walks is to deliver physical health improvements, particularly related to cardio-pulmonary problems, but there is also a strong mental health focus. Many participants are referred as a result of depression or other mental health issues and claim that the physical activity, social interaction and interaction with the natural environment all deliver tangible benefits. Some participants, who became involved to regain fitness after operations or other health set-backs, reported significant and measurable improvements to their physical health:

"I find that I am now walking further and find it easier as I no longer need to take my medication for angina. All of this keeps me fit to look after my 15 grandchildren and two great-grandchildren!" (Walking group participant).

Others provided evidence of emotional and psychological benefits, such as the ability to cope with personal loss:

“When she died I had to do something different... I felt the need to do this again with people who had no previous connection with either of us and wouldn't be able to stir up memories even though all of these memories were good” (Volunteer Walk Leader).

However, not all participants are motivated by specific mental or physical health needs. A number of walkers reported that they attend the walks because of the general sense of well-being that they derive from them:

“I thought it would be a good way to get out of the house. I initially started going out on walks with the group and this has helped improve my confidence and allowed me to meet new people. I have also been encouraged to try other activities with Ageing Well, such as badminton, dancing and acting in a roadshow” (Walking group participant).

Others simply enjoy the experience of woodland environments:

“I enjoy seeing different types of nature and birds on the walk as well as searching for wild flowers, mosses and ferns for the group to see” (Volunteer Walk Leader).

Health and well-being in the Glasgow and Clyde Valley region

Forests and woodlands in Glasgow are increasingly used as prime spaces for health-related physical activity, with health now widely recognised as the fastest-expanding sub-sector of forest-related activity. Glasgow is a particularly interesting and important case study of the health benefits of forests and woodlands because, in general, its citizens have experienced poor health. The Glasgow Centre for Population Health's "Let Glasgow Flourish" Report (Hanlon *et al.*, 2006) states that: "Not only does Scotland's health compare unfavourably with other parts of the UK, it has one of the worst health profiles in Western Europe". Further, Glasgow has high levels of health inequalities, with rates of morbidity and mortality being polarised between communities of different socio-economic status. The report also states that: "Greater Glasgow not only has the communities with the highest mortality rates in Scotland, but also those with the lowest mortality". The opportunity to look at two of the most deprived communities in Scotland to see how the use of forests and woodlands is helping to tackle the issues of poor health and health inequality was a primary reason for the selection of Glasgow as a case study.

The use of woodland spaces for physical activity is being actively promoted in Glasgow. All three of the woodland sites studied are regularly used by organised walking groups and all feature play areas that are well used by children and parents from the local communities. There are a number of key initiatives including local groups of the Paths to Health programme and a pioneering project co-ordinated by the South-East Community Health and Care Partnership which has developed a system of 'social referrals' whereby GPs prescribe participation in lifestyle-changing activities such as walking in woodlands. In addition, all the sites studied have popular volunteering programmes, which enable participants to be active outdoors while also gaining basic woodland management skills and improving the quality of the woodland spaces themselves.

Awareness of the potential health benefits of woodland-based activities was reported by all the project leaders interviewed as part of the research, whether or not public health was the primary orientation of the project. Beneficiaries of the projects themselves reported both physical and mental health gains from their woodland-related activities. Physical health benefits included improved general fitness and faster recovery from injury, operations and trauma:

“I’ve got arthritis, I can just sit in the house and go, ‘Ah, I’ve got pain’. I can take another two tablets and hope it goes away. Or, I can go out and walk and get out and do things and your mind’s taken off it. Plus it gives ya pheromones [sic] and it moves ya, and it helps ya. And if you don’t do it you gonna fall and crack a bone” (Community member, Castlemilk).

Respondents also reported mental health benefits, ranging from increased self-confidence, to actual recovery from diagnosed mental health problems. An important finding of the research was the powerful therapeutic effect of shared, collective experiences of the outdoors. This therapeutic effect was particularly emphasised by those respondents experiencing anxiety disorders and other mental health problems, with some attributing their ability to re-integrate into mainstream society to these social experiences:

“When I started it took me two to three weeks to trust the staff and I was wary of the other patients, but I’m glad I went. It has given me a lot more confidence. Before I wouldn’t have had a conversation, now it’s the one group I look forward to. I enjoy my conversations” (Paths to Health participant).

“I was in hospital for quite a while. I was scared to go out I was even scared to go home on pass, then I was referred to the walking group. I was really unsure about it. I tried to go but I was nervous so I just went back to bed.... I decided to give it a shot.... I felt fitter and it really cleared my head. I enjoyed meeting other people and chatting on the walks. I feel this was a good step to me being discharged” (Paths to Health participant).

There is some indication from the research findings that within the context of activity in greenspace generally, forests and woodland spaces have a particular value in terms of health. One Paths to Health Walk Leader was keen to stress that forest walks were preferred among participating walkers, particularly among more advanced walkers who enjoy the more challenging environment afforded by woodlands and forests:

“If people are advanced walkers, then they will rise to more exciting and challenging spaces, especially wooded ones” (Paths to Health Walk Leader).

4. RECREATION AND ACCESSIBILITY

Simply having fun is one of the main motivators for people taking part in woodland recreation:

“I just like going to the woods coz they’re fun!” (Pupil from St. Joan of Arc School in Glasgow)

'Recreation for fun' is a feature of many forest-based activities and, as such, recreation benefits are present in many of the other 'forestry for people' benefits examined during the case study research. Activities range from organised, formal pursuits such as volunteering, project-based health walks and education visits, to informal, routine activities like dog walking, family play, or simply enjoying the outdoors. For many respondents, the value of social interaction during recreational activities is as important as the activity itself. As such, by providing a setting that lends itself to a wide range of recreational activity and social interaction, forests and woodlands in both case studies provide a context for a range of social benefits that are highly valued by local communities.

Recreation in the Loch Ness region

The development of an extensive paths network, including major access routes such as the Great Glen Way on the Loch's north shore and the Fair Lad's Trail on the south shore, have provided an important foundational recreation resource that brings many people to the area. Furthermore, recent developments such as the Loch Ness 'Jacobite Cruises' have been extremely popular. Recreation activities around Loch Ness range from extreme sports, such as mountain biking, canoeing and hill running, through to more sedate activities, such as walking, rambling and car-based sight-seeing.

Forests and woodlands are a key component of the wider recreation resource in Loch Ness. For example, water-based sports such as canoeing, take place in rivers which flow through forests, and often forests provide access to them:

"The majority of canoeing that takes place is in forest and woodland, direct by the rivers. There are about 30 rivers within the Great Glen area that are used by canoeists" (FES Ranger).

Giving an account of the Wet West Paddle Fest, which involved over 200 people canoeing down the Rivers Garry and Morriston, Great Glen Way rangers stated that the forests seen from the rivers are key to the popularity of the event.

The high increase in popularity of mountain biking in Scottish forests is now a well-known phenomenon and the forests around Loch Ness are becoming a mountain bike destination of regional and national repute. The development of a network of mountain biking trails in the area started with the informal use of walking paths by local young people, who were also building trail features which were considered by some local people to be unsafe and located in inappropriate places where they posed a risk to other forest users. Respondents reported that this was the cause of significant local controversy and disquiet.¹¹⁵ Forest Enterprise Scotland were reported to have adopted a constructive approach to tackling the issue by working with local mountain bike enthusiasts to create designated cycle areas:

"So [individual named] did a proactive way of addressing that, saying 'lets build them safely, but lets build them here', rather than saying 'don't build them, stay out of the forest'" (Forest Enterprise Scotland officer).

As a result, mountain biking is now more accepted by locals and visitors as a legitimate use of forest spaces. This is an example of how the careful management of a recreation resource can have a positive social impact through the mediation of local conflicts, fostering closer

¹¹⁵ Under the Land Reform (Scotland) Act 2003, the public has a right of responsible access to most forest land in Scotland, as outlined in the Scottish Outdoor Access Code.

community cohesion. Indeed, many respondents now recognise the potential for mountain biking to bring much-needed visitor and tourist revenue to the area, while also stressing the need for proactive and targeted development of the potential resource:

“If you invest in it [mountain biking] and promote it, it will last much longer, and it will make great jobs, they will be fitter and healthier” (Highland Council Councillor).

“[They should] put in loads more tracks and mountain bike tracks, as part of the outdoor activity for Loch Ness. Loch Ness is a fabulous outdoor activity place, but it is hardly ever advertised as such... it needs pulling together” (Community woodland group board member).

The recreation potential of the forests and woodlands in the Loch Ness area was recognised by many respondents. This is particularly the case with members of community woodland groups, for whom maximising the recreation and associated benefits for local communities is a primary reason for their ongoing involvement in community-based acquisition, development and management of local woodland resources.

Recreation in the Glasgow and Clyde Valley region

Respondents across the Glasgow and Clyde Valley case study sites indicated that they value very highly the recreational benefits of woodlands. These benefits are gained through organised activities, such as guided walking and cycling, and volunteering. The majority of recreation visits, however, are made for informal, routine recreation pursuits where people enjoy exercise and being outdoors just going for a walk, having a picnic, and spending time with family and friends. A common motivation for participants in formal and informal recreation in woodlands is the general sense of enjoyment and well-being that comes from being outdoors:

“I used to sit around my house and mope. Getting out and walking makes me feel so good. I recommend it to everyone” (Greenwork Mates graduate, Drumchapel).

“There is just something about going into the forest which makes me feel so good” (Special needs student).

A sense of well-being and enjoyment is derived as much by those who participate in more active forest sports, such as cycling, orienteering, running and horse riding, as it is by those who take part in activities of a more gentle nature, such as photography, dog walking and picnicking. More active sports account for an increasing proportion of recreational visits to forests and woodlands in Glasgow and site managers are responding through the development of modern facilities. Innovations such as the 'Go Ape' Challenge Centre in Anniesland, for example, provide opportunities for adventure play modelled on traditional outward bound facilities. 'Go Ape' users engage in forest canopy activities using high wires, carriages, zip slides and high boardwalks. They experience the forest canopy – a part of the forest not normally accessible, and engage in adventure play where an element of danger and risk is a major attraction.

A significant development is the creation of a competitive mountain bike track in Cathkin Braes Park in Castlemilk, as part of the developments for the 2014 Commonwealth Games. Building on existing, informal cycling in the park by local community residents, the development will provide dedicated mountain bike trails. Officers at the Castlemilk Environment Trust believe that these trails will be an important component of the

Commonwealth Games' legacy, improving recreation and sports facilities for Castlemilk residents.

5. CULTURE AND LANDSCAPE

In this sub-section the cultural values associated with the woodlands and forests in the two case study areas are described and analysed. Following the typology adopted by the overall project, cultural values refer here principally to local community meanings and identities that are represented in forest sites and features, or expressed through various forest-based activities, practices and events. Within this conceptual framing, forests and culture are seen as mutually influencing, and evidence of both the 'community in the forest', and the 'forest in the community' is given.

In the Loch Ness region, particular focus is given firstly to the use of forest spaces as a kind of canvas for the expression of individual and community identities through the creation of visual art, performance art, music and language, and secondly to forests as a setting for formal cultural events and programmes which foster and project a sense of local and regional identity. In the Glasgow and Clyde Valley region, forests and woodlands play an important role in the collective memory of local communities, providing a kind of 'storied space' in which family and community identity is re-affirmed through various forms of social and cultural engagement. The importance that individuals and communities attach to a sense of ownership of their woodlands is also conveyed by describing some of the ways in which 'community in the forest' is realised through modifications to forest spaces. These modifications further illustrate the active role that woodlands can play in shaping community identities.

This sub-section also examines the benefits associated with the contribution that forests and woodlands make to the quality of the landscape in the two case study regions. The analysis gives particular focus on activities that provide a context for an appreciation of the aesthetic qualities of woodlands and forests, and for the forging of attachment to, and a sense of identification with, a given locality. There is a significant difference in the ways in which the aesthetic qualities of landscape are experienced and exploited, perhaps because these qualities are so markedly different in the urban and rural settings of the two case studies. Insights from the Glasgow case study raise an important point of principle for urban forestry, where value seems to be derived less from the aesthetic qualities of forested spaces, and is more conditional upon a community's ability to access its woodlands, to work in and with them, and to gain ownership of them.

Culture and landscape in the Loch Ness region

The formal arts represent an increasing area of forest-related cultural expression in the Loch Ness region. This includes the visual arts, music, poetry and song writing. These activities and artistic products are the result of formal organisation and, in many cases, careful marketing to a wide regional, national and international audience. As such, forest-based formal arts contribute to, and allow expression of, local identity and pride, while also generating an important revenue for local individuals and businesses.

HiArts, an organisation operating under the sponsorship of Highlands and Islands Enterprise (HIE), has been largely responsible for supporting the work of artists in the area. Recently it has been re-incorporated into HIE, but leaves a legacy of investment in forest-based art. Examples of visual and word-based art include a Sculpture Trail in the Foyers area at the head of Loch Ness, an installation which combines poetry and sculpture in the local forest.

According to the Highland Council rangers, it is very popular with both visitors and locals, contributing to a local sense of pride in the woodlands, and acting as an important visitor attraction. Another HiArts project supported the creation of 'landscape poetry', providing funding for regional poets to visit and draw inspiration from local forest spaces.

'Community in the forest' in Abriachan

Abriachan Community Woodland provides a good example of local uses of a forest space for the expression of identity and ownership. In this woodland, young people have used forest materials to create artistic features and installations. Stones, branches, moss, leaves and other forest materials are arranged into artistic features, many of which display a surprising level of creativity. For example, slices of tree trunks hold portraits and are hung in the trees, twine is strung between trees to create webs, and there are many examples of tree graffiti. When questioned about this, one respondent explained that:

"They create a sense of ownership, a label on a tree makes all the difference, you know 'that's my tree'" (Abriachan Forest Trust officer).

In these ways, the presence of artistic features in the woods marks the presence of a 'community in the forest' – in this case, a community of young people expressing a sense of belonging and marking their ownership of the woodland space. This 'signposting' within the forest is accepted and valued by other forest users, with the children's art remaining remarkably intact and un-vandalised over time.

Abriachan Forest Trust has been successful at raising funds for interpretation and signage. This performs the simple function of providing information, directions and marking trails for forest users. However, local community identification with the woodlands informs the design and creation of signage, and interpretation draws attention to features that are deemed worthy of particular attention. As such, they are expressive of the community's knowledge of, and identification with place. A good example of formal interpretation in Abriachan is provided by a series of installations along an all access path. These installations are also an example of signposting by young people who participated in the planning and creation of the path through the red squirrel conservation project. The installations feature wood carvings based on children's drawings of birds and other woodland animals and are located on sections of path where there have been regular sightings of the featured species. Under each carved image can be found an information panel and a small button which, when pressed, delivers a digital recording of one of the children telling the listener about the project.

Informal expressions of local identity and culture in the everyday lives of local residents was highlighted by many respondents as an important aspect of forest use. The Gaelic language, with the strong associations it has with forest imagery, is a powerful medium for the everyday expression of local forest-based identities. The alphabet, which associates each letter with a tree or shrub, is starting to be used on interpretation signage in woodlands, especially in the Foyers area. The presence of Gaelic signage is evidence of an increased presence of the community in the forest, and demonstrates how forests and woodlands are being used to express, project and preserve local and regional culture.

The Loch Ness area is famous for its breathtaking scenery. The significant presence of forests and woodlands makes a strong contribution to the high visual impact of the Loch Ness landscape, and is a key attraction which brings many people to the area. The research findings suggest that there is a strong visual and contemplative dimension to experiences of Loch Ness, with the appreciation of woodland views featuring as a significant component of the consumption of place:

"The perception of the foreign visitors is the landscape. The mountain climbs, forestation, water, lochs, it's all in there" (Tourism operator).

In particular, seasonal changes in the woodlands and forests are a key attraction for visitors and residents alike:

“There is a lot of photography that goes on and I think that days like today with all the different colours, just ordinary touring people who would never get out of the car, sort of walk, sort of older people, you know, they are all taken on the colours” (Accommodation provider).

The research reveals that the aesthetic qualities of woodland in the landscape are a key motivational factor in almost all recreational uses of Loch Ness, making them a highly valuable resource for local business. In turn, these aesthetic qualities have been incorporated into the projected identity and branding of the Loch Ness area:

“There is not a day that goes by that I don't send people walking in the forest. The interest in those trees is tremendous” (Tourism operator).

“It's a big draw, they come up and it just blows them away when they see the landscape like it is” (Accommodation provider).

Culture and landscape in the Glasgow and Clyde Valley region

The formal arts are also an important form of forest-based cultural expression in Glasgow. The City of Glasgow, for example, contracts artists to create sculptures from forest materials, and provides them with workshop space in Pollock Park. In addition, the city employs a resident carpenter, who uses timber from the Park to create bridges, railings and interpretation signage. The Glasgow Forest Education Initiative also delivers art-based education and employs two artists to work with forest materials in local schools. The artists hold workshops for students, teaching them how to create artefacts from materials gathered in the forest.

Forest spaces in the region are also providing a setting for the expression of an increasing cultural diversity in Glasgow. A local Sikh community group, for example, recently used Pollock Park to host a three day 'puja' event, which involved creating a temporary 'Gurudarwa', or temple, in the forest grounds. Ceremony, song, ritual and food were all prepared in one of the wooded areas of the Park. According to City of Glasgow rangers, minority ethnic groups increasingly use woodlands as a setting for language learning and cultural expression. Asian community groups, in particular, use woodlands for language classes and as a destination for social outings. Many report that these outings are an important means of integration into wider Glasgow society.

Public greenspaces in Glasgow have long been used by local residents both as venues for significant events such as weddings and anniversary celebrations, and as the setting for more everyday, but nonetheless significant social activities. In these ways, forests and woodlands in Glasgow perform important social and cultural heritage functions, acting as symbols of past and ongoing individual, family and community experiences, and providing a type of 'storied space', which can be highly valued by members of local communities. Many families bring young children to see the tree in which their parents or grandparents played as youngsters. Trees also mark important family events such as weddings, birthdays, or special picnics and serve as symbols of important family events. Family photographs often record these events and older relatives will sometimes bring old photographs to the park to show younger members the exact trees that bore witness to these important social occasions.

Rangers reported that they are often asked to help find a tree in a family photo, or to direct people to trees that feature in family stories.

Providing a setting for everyday activities and practices which are expressive of local identity and local ownership is perhaps the most important cultural function of forests and woodlands in Glasgow. This function is emphasised by those respondents who use forests and woodlands regularly for recreational and volunteering activities. Volunteers, in particular, can place great value on the signs of their own labour, showing strong attachment to, and pride in the symbols of the energy, time and effort they have invested in improvements to 'their' forests. Excited exhortations to '*come and see what we've done*' by Greenwork Mates in Drumchapel are a good example of this.

In contrast to Loch Ness, there is much less emphasis placed on the visual and contemplative consumption of forests and woodlands by respondents in Glasgow. However, for residents in all three sub-regions of the case study area, there is an equally strong sense of identification with, and attachment to forested spaces, despite quite marked differences in the aesthetic qualities of the forested spaces within them.

The three sites in the Glasgow case study area contain very different woodland types. Pollock Country Park, in the grounds of an old estate, features significant areas of old hardwood trees located in a rolling parkland landscape. In contrast, both Drumchapel and Castlemilk contain a mix of scrub woodlands (in Drumchapel Woods and Castlemilk Park) and older established wooded areas (in Garscadden Woods and Cathkin Braes Country Park). The scrub woodlands feature relatively young broadleaved species and, at first glance, present a uniform dun façade. The areas of old woodland conform much more closely with standard notions of 'beautiful forests', containing a mix of species of both broadleaves and conifers.

Between and within these sub-regions, however, many residents value 'their' woodlands almost equally, despite these obvious aesthetic differences. When asked, respondents were happy to agree that the older forests were more beautiful, but quickly returned to valuing both types almost equally. Their notions of value seemed to have little to do with aesthetic determinants such as species type and age. Rather, their perceptions were much more conditional upon the activities they engaged in, and the sense of ownership they derived through these activities. For example, respondents involved with the Greenwork Mates programme in Drumchapel reported highly positive amenity values for their woodlands, despite their ostensibly limited aesthetic appeal. The value they attach to their woodlands comes much more from the fact that they have gained control of the woodlands and transformed them into an important community asset, making them a source of local pride and a symbol of their new-found ability to work together towards a brighter future.

6. COMMUNITY CAPACITY

Within the Forestry for People project, the 'community capacity' theme refers to qualities or 'assets' that are beneficial to the collective and which are enhanced through forest-related activities, making a positive contribution to an ongoing community development effort. Many of these assets are captured by the term social capital, which combines two discrete elements: social connectedness, and norms of trust and reciprocity (Putnam, 1993). Research in both case study locations revealed evidence of forestry's positive contribution to social connectedness both within community groups (the form of connectedness which Putnam refers to as 'bonding' social capital) and between community groups and their

expanding networks of external delivery partners (examples of Putnam's 'bridging' social capital). The rapid and extensive growth of partnership working and the outward-facing dynamic of community forestry relations highlighted by the case study research suggests the need for a re-definition of community forestry in Scotland. This re-definition is covered in sub-section 3.4, where evidence is presented of the ways in which communities continue to use forestry as a mechanism for using internal resources and assets to bring about positive community development.

Qualitative evidence from both case studies suggests that forest-related activities both draw on and enhance the assets, or capacity, within community groups. Coming together to acquire and manage a communally owned woodland resource means that the community involved works together, bringing individual capacities to a collective effort. Community development is an active process and the development of community capacity is achieved through *activities*, which lead to the development of the assets or services which the community values and wishes to promote. Thus, a key indicator of community capacity is a community's ability to mobilise resources and skills within its internal and external networks. The results of research in Loch Ness suggest that sustaining the momentum of a vibrant, regional community woodland movement depends on each group's ability to draw on the experience, expertise and enthusiasm of its existing members and to maintain a steady turnover of membership in order to take advantage of new development opportunities as they arise. Research in Glasgow highlights the importance of fostering active local involvement in the planning and delivery of forested spaces and forest-related projects. This involvement can create a sense of community ownership, and it also gives many participants the opportunity to develop skills, knowledge and experience that they can apply in other contexts. In this way, the assets and capacities within a community are not merely exploited, but are actually enhanced through involvement in the delivery of a valued community resource.

Community capacity in the Loch Ness region

The Loch Ness case study area contains a number of communities who were early pioneers in community purchase and management of woodlands. The fact that the area falls within the area of the Highlands and Islands Enterprise (HIE) was a significant factor in allowing this to happen. Formal designation of the Highlands as an area in need of development meant eligibility for various sources of European Commission development funding. Many of these, such as LEADER, were directed at the development of community capacity. The strong feelings surrounding community ownership of land – a legacy of the Highland Clearances and the continued dominance of large landowning estates – drove the desire for communities to own their own land. In the words of one respondent:

"Land is power and when you have the power, you have the capacity to do things"
(Abriachan Forest Trust member).

Ownership of land was the principal objective of the early community woodland movement in the region, and community assets, in the form of leadership skills and experience in project management and funding, were mobilised to that end. In those early days, communities established a foundation of internal capacity that would form the basis for subsequent development projects and programmes:

"It [starting a community woodland] builds a lot of community capacity in as far as, in the beginning it brings the latent leadership within a community together, and it brings the energy together" (Highland Council Councillor).

Each community's ability to mobilise its internal resources and assets, to combine skills, agree goals and work together, provides a neat example of Putnam's 'bonding' social capital. Developing this social capital is an ongoing process of mobilising and enhancing skills that is vital to each group's long-term survival. Expertise and experience within the community must be actively sought out and nurtured if the group is to capitalise on new development opportunities as they present themselves:

"You have got to actively turn it over, bring people in and make sure it is moving on..."

"Leadership. Energy to start up. Then you need to actively bring people in. You have to work at moving on... creating turnover."

"These things have phases, but you have to look to moving it on. You have to build into your constitution that a third stands down every year. Because otherwise it stales up very quickly and people then get frightened of doing things" (Former Abriachan Forest Trust Board member).

The community woodland experience in Loch Ness shows that collective ownership and management of a forest resource can provide a focus for the mobilisation and development of community capacity. The bringing together of individual assets and skills is seen as critical to establishing a strong foundation for an ongoing collective development effort. Community groups cannot survive by working in isolation, and are increasingly dependent upon the partnerships within which they now operate. However, in this regard also, the community capacity within each group can be seen as a critical determinant of its success, reflecting its ability to organise and position itself in relation to the external networks which hold the key to future collaborative accomplishments.

Community capacity in the Glasgow and Clyde Valley region

The Drumchapel and Castlemilk sub-regions both contain woodlands (Drumchapel Woods and Castlemilk Park) that are used as a resource by neighbouring community groups for regeneration projects and the delivery of a range of social benefits. The community capacity of local groups is central to the ability of members to mobilise this resource. Within Drumchapel, for example, Drumchapel Woods and Garscadden Woods are both used as venues for the Drumchapel Greenwork Mates to offer training in woodland maintenance skills, and to organise community events which develop community pride in the area and a sense of ownership. Projects like this are often dependent upon partnerships between key actors, in this case between FC and the Glasgow West Regeneration Partnership. Typically, however, they are equally dependent upon local residents to provide an engaged constituency and, crucially, a team of volunteers who participate and carry out essential, routine maintenance tasks.

The volunteer participants in Drumchapel are at the core of community involvement in the day-to-day management of the woodlands and, through their participation, they gain skills, knowledge and experience that can be applied in other walks of life. At the same time, however, the wider community benefits from their involvement, both through the increased amenity value of the woodlands, and through the creation of a wider sense of collective ownership and control over a valued community resource. Respondents from within the Drumchapel Greenwork Mates group were keen to emphasise their pride in their woodlands and to demonstrate their sense of ownership and responsibility for the wider benefits to the community:

“Aren’t our woodlands lovely!”

“I feel like I am making the environment better for everyone.”

“[the project has] ...brought together a group of people from many different backgrounds who have all bonded together. We are more like a family.”

Building community in Castlemilk

The Castlemilk Environment Trust’s programme of developing the woodlands around the Castlemilk community is at an early stage of delivery. However, even at this stage, a rapidly increasing core of social capital is being used and enhanced through a range of initiatives. A number of community volunteers, for example, have been instrumental in the preparatory phases of woodland development. In particular, they have worked on a ‘Map Pack’ project to catalogue all the features and activities that currently take place on site. They are also active in trail management, participate in bushcraft workshops and planting days, and have played a pivotal role in raising community awareness of the woodlands, and in fostering wider community participation in planning and decision-making with regard to future development initiatives. Volunteers interviewed as part of the research spoke of their love for the woodlands as an important asset for the wider community.

3.3 COMMUNITY AND INDIVIDUAL DEVELOPMENT: ISSUES AND NEEDS

BACKGROUND

Building on the thematic analysis of social benefits, this sub-section draws on evidence from the case study research to demonstrate the ways in which forest-related activities are helping individuals and communities to confront and address important development issues and needs.

As set out in sub-section 3.1, the first phase of case study research involved the profiling of each case study area. The profiling involved desk-based research and 'scoping' interviews (mostly by telephone) with key stakeholders. In addition, available socio-economic statistical data relating to employment, deprivation, and social groupings was gathered and analysed. The primary purpose of this profiling phase was methodological, providing a basis for the selection of sub-regions, and of target groups and individuals that would be suitable for more detailed research. However, by canvassing a wide range of organisations, institutions, partnerships, voluntary organisations and other groups to gain an overview of the 'Forestry for People' activities taking place in the selected areas, the profiling work also analysed both the key development issues and needs being faced by communities within each case study location and the institutional and geographical orientation of forest-related initiatives in relation to these issues and needs.

This sub-section starts by giving a brief overview of the profiling results, focusing on the current development issues highlighted by the data gathered in each case study location. In the subsequent analysis, key issues are selected and evidence is presented to illustrate the ways in which forest-related initiatives are helping individuals and communities to confront these issues.

ISSUES AND NEEDS IN THE LOCH NESS REGION

The analysis of background socio-economic data for Loch Ness suggests a comparative lack of deprivation in the area, as defined by the Scottish Government. The Highland Regeneration Outcome Agreement proposal of 2006 discusses deprivation within communities across the Highland region. No communities within the case study area fall within the 15% most deprived areas according to the Scottish Index of Multiple Deprivation (SIMD) (Highland CCP, 2005). However, work within the rural studies field has long asserted that rural deprivation differs significantly from urban deprivation. In particular, low population densities, poor housing stock, isolation, and the differing nature of rural employment (often characterised by comparatively high levels of self-employment, and high rates of seasonal and part-time employment rates) are not covered by established indices of deprivation, but do nonetheless represent significant challenges for rural communities (Cloke, 2006).

Taking this into consideration, an appraisal of the socio-economic situation in Loch Ness shows that there are several factors which present problems for local communities. At 0.32 persons per hectare, the region has relatively low population density in comparison to the average for Scotland (0.65 persons per hectare). This is reflected in the related problems of community isolation and poor public service provision. These, in turn, are indicated by relatively high levels of car ownership, highlighting the long distances that residents must travel to go to work, to shop and to access services. As is the case with other rural areas, the

economy in the Loch Ness region is characterised by relatively low wages and high levels of self-employment, seasonal and part-time work. In addition, the decline of primary sector activities such as farming and forestry has not been off-set by the rise of any major, new employment sector, despite a marked increase in tourist sector activity.

These issues combine to create a situation where many young people are leaving the area in search of better employment and lifestyle opportunities, either in urban areas of Scotland, or in other parts of the UK. This is indicated by data relating to the age distribution of the Loch Ness population, which shows that only 13% of the population are within the age range of 18-29 years, in comparison with an average for Scotland of 15%. Furthermore, the mean age is relatively high in Loch Ness, at 41 years, compared to the national mean of 39 years. The out-migration of young people constitutes both a key development problem that threatens the long-term sustainability of local communities in the region, and also a genuine development need that 'Forestry for People' is potentially well placed to address.

Forest-related community development in Loch Ness

The case study findings show that forest-related activities, initiatives and projects are providing important economic and livelihood opportunities for the resident population, making a positive contribution towards the sustainability of local communities. Many of these opportunities are being created through the work done by community woodland groups to deliver a range of benefits to the wider local and regional population. These efforts are helped significantly by incidental factors, such as the area's strong scenic resources and its proximity to the urban population of Inverness. However, innovative forest-based developments, such as facilities for a wide range of recreation activities, and the co-ordination of highly popular forest-based education initiatives, indicate that 'Forestry for People' in Loch Ness is making a significant development contribution in the region. In particular, forest-based activities are enabling many groups and individuals to take advantage of opportunities afforded by the new 'experience economy'.

While this research is limited to two case studies, an impression of this development effect can be conveyed by summarising evidence of the positive employment and livelihood impact of 'Forestry for People' activities discussed in detail in sub-section 3.2:

- opportunities for young foresters to provide forestry services to privately and community-owned woodlands
- increased employment opportunities in specialist timber processing industries
- livelihood and employment opportunities in tourism sector created by FCS investment in forest-based recreation facilities
- ranger jobs to deliver outdoor recreation events and programmes
- livelihood opportunities for artists and galleries
- employment and livelihood opportunities within community woodland groups delivering recreation and education projects

An example of the positive community development impact of forest-based employment generation is provided by Abriachan Forest Trust (AFT). As discussed earlier, the provision of education services by the AFT has developed from a peripheral activity supported by volunteers, to a core delivery programme with revenue that now accounts for a significant proportion of the Trust's operational income. Education delivery is now a central feature of a new business plan for the community woodlands, and has enabled continued investment in the development of educational resources, culminating in the acquisition of capital funds to build a new forest classroom in 2006. The AFT is now at the point where education can go

beyond merely providing funds to support other activities and can actually provide an income for a full-time education officer:

"[Now], I'm teaching the rural skills, I am actually getting paid by the Local Authority for that. When I said I am not getting paid, actually I [recently] got my first pay cheque for that... at supply rates!" (AFT Education Support Officer).

The AFT is now starting to combine the provision of education and recreation services, with the potential for similar successes in terms of operational income generation and the creation of employment opportunities for young people. The Trust has recently purchased a number of mountain bikes, and has employed a part-time Education Support Officer to teach mountain bike skills. The classes are enthusiastically received, and the rental of the bicycles provides useful income, with schools paying the Trust £175 for a day's use of the bikes on the site. On average, the Trust delivers one mountain bike training class per week, and demand is steadily increasing.

ISSUES AND NEEDS IN THE GLASGOW AND CLYDE VALLEY REGION

Many residents of the Glasgow and Clyde Valley case study areas experience multiple deprivations. Using data from the Scottish Index of Multiple Deprivation, the Glasgow Community Planning Partnership (Glasgow CPP) has calculated that 38% of the most deprived 15% data zones in Scotland are located within the Glasgow area. Around 310,000 people, or 54% of the population of Glasgow, live in these deprived areas of the city (Glasgow CPP, 2005). Analysis of individual SIMD and other indicators highlights some of the key development issues facing the Glasgow population. For example, the resident employment rate is 65%, compared with the Scottish average of 74%. In other words, one-third of working-age people do not have a job. Almost a quarter of Glasgow residents (23%) claim key working age benefits such as Job Seekers Allowance, Incapacity Benefit, or Disability Allowance. The Scottish average is 14%. More than a quarter of Glasgow residents (26%) have a limiting-long-term illness, compared with 20% for the rest of Scotland. 23% of the working age population of the city have no formal educational qualifications, while the Scottish average is 17%. More than half of Glasgow's housing stock (53%) falls into the lowest Council Tax valuation bands (A or B). The recorded crime rate in Glasgow is 66% above the national average (Glasgow CPP, 2005). The statistical evidence shows that there are more communities in Glasgow experiencing multiple deprivations than any other urban area in Scotland.

These deprivations are, for the most part, a reflection of the negative social and economic impacts of a declining industrial sector. The impacts have been exacerbated, however, by a legacy of poor planning decisions, made in the 1950s in response to a post-war housing shortage, which authorised and financed the construction of large housing estates. Although these new-build estates were initially popular, their peripheral location and a lack of services provision meant that their popularity began to diminish. Many estate residents worked in industrial jobs which were lost during subsequent recessions plunging many into permanent unemployment. Many of the estates are within Glasgow's most deprived areas.

Glasgow has a long record of attempts to counter these deprivations. Regeneration partnerships were set up in the 1960s and many models of partnership working now applied across the UK were first pioneered in Glasgow. Significantly, the current regeneration plans and structures for Glasgow acknowledge the importance of the city's physical environment

for sustainable social and economic development. For example, the vision for a 'Vibrant Glasgow' set out in the Glasgow CPP's Community Plan states that:

"The term 'vibrant' integrates the physical environment with the way in which people use the city's public spaces and amenities. The atmosphere in the city, which makes it attractive to residents and visitors, is dependent upon this interaction. Given the broad physical and environmental content within the vibrant theme, the aims are necessarily comprehensive and involve a wide range of partners and strategic approaches to the issues across the city ranging from physical and environmental to social and transport issues" (Glasgow CPP, 2005: 40).

One of the key observations made in the Glasgow CPP report relates to the city's status as a city of sharp inequalities. Glasgow not only contains some of the most deprived areas in Scotland, it also contains some of the most prosperous. Often, widely contrasting communities are located in close proximity to one another (Glasgow CPP, 2005). An important axis of inequality relates to the environmental resources available to different communities, and there is wide recognition that many deprived communities either do not have accessible greenspaces within their locality or, for various reasons, do not make use of them. This is immediately apparent when looking at Drumchapel, one of the selected case study sub-regions. Drumchapel's problems revolve around the spatial peripherality of its location. This affects employment, as long distances and poor public transport services make it difficult for locals to access jobs in growth areas of Glasgow. As an exacerbating factor, however, Drumchapel lies in close proximity to the 'leafy suburbs' of Bearsden and Milngavie. Consequently, there has been a long-running disengagement among the residents of Drumchapel with the forests and woodlands that are part of nearby greenspaces. It appears that, for many Drumchapel residents, the use of greenspace is seen as the preserve of other, more affluent sections of society – in this case, the neighbouring communities of Bearsden and Milngavie. This disengagement is documented in a Woods In and Around Towns (WIAT) baseline survey, undertaken in Drumchapel in 2006/07, which recorded neutral attitudes to local woodlands amongst Drumchapel residents (Ward Thompson *et al.*, 2007).

One aspect of the regeneration agenda in Glasgow, therefore, focuses upon ways of addressing the issue of environmental inequality. The 2006-08 Glasgow CPP Regeneration Outcome Agreement (ROA) places strong emphasis on the need to improve the quality of the physical environment, both in terms of housing, and in terms of the outdoor public spaces located near to deprived communities (Glasgow CPP, 2005). Recognition of the importance of greenspace has resulted in renewed efforts to revitalise the city's woodland and to encourage a wider constituency of users through a range of initiatives. Some of these initiatives are discussed below.

Another important cause of deprivation and inequality in Glasgow is ill health. Glasgow has an unenviable status as 'the sick man of Europe'. Health problems are often particularly severe in deprived areas, which means that health is another important axis of inequality in Glasgow. The Glasgow CPP ROA, for example, identifies communities within the Drumchapel and Anniesland, and Garscadden and Scotstounhill areas as those suffering disproportionately from the affects of poor health. For these communities emergency admissions are 6% higher than the Glasgow average, residents have a 19% higher incidence of cancer than the rest of the city's population, and a higher than average number of babies are born with low birth weight. Public health improvement and tackling issues of health inequalities are top priorities in the Glasgow CPP's Community Plan, which sets out a vision for a 'Healthy Glasgow':

“We will improve the health of everyone in Glasgow and narrow the health gap by improving the health of the most disadvantaged communities and groups at a faster rate” (Glasgow CPP, 2005: 29).

The role of healthy activity is central to this vision and attention is increasingly being given to spaces for outdoor recreation. Thus, the Community Plan sets out the imperative to improve the quality of the city’s outdoor spaces, creating a policy opening for the funding and management of forest and woodland spaces as vehicles for the provision of community health benefits.

Forest-related community development in Glasgow

The combination of a specific set of development challenges, particularly relating to the issues of environmental and health inequality, and a sophisticated understanding of innovative ways to address them, makes Glasgow an ideal area for both the delivery and the evaluation of woodland- and forest-based initiatives which aim to address key development issues facing the population.

Social exclusion and related environmental inequality is a particularly pressing issue for the communities of the Drumchapel housing estate. Located at the northern periphery of Glasgow city, many families have spent their entire lives in social housing and receiving social benefit. The area has been in receipt of a WIAT grant supporting community activities in two woodland areas: Garscadden Woods and Extension, on the northern boundary of Drumchapel; and Drumry Wood (sometimes called Drumchapel Woods) in the west. As mentioned above, these activities are set against a backdrop of almost complete disengagement with local greenspace by local residents. As such, Drumchapel provides a useful opportunity to measure the local development effect of forest-related interventions.

One such intervention is the Greenwork Mates scheme discussed in sub-section 3.2. Organised by Forest Enterprise Scotland and funded by Glasgow West Regeneration Agency (GWRA), Greenwork Mates is a volunteer training programme working with those receiving disability benefit and in long-term unemployment. The scheme offers the chance to participate in forest management activities in the local community woodlands and to gain general ranger skills. The scheme is already providing some participants with a route back to employment. The scheme has received a request from the Clan Ranald Trust for Greenwork Mates volunteers to help with its motte and bailey restoration project on clan lands in Loch Carron. This came from Workmates visits to the site, leading to a formal arrangement offering voluntary ground work in exchange for training in construction skills. This is a clear signal that the work of the Drumchapel Workmates group has been valued by an external partner, confirming both their skill and potential employability.

It is worth noting that significant problems were raised during the pilot phase of the scheme, for example a reported desire among many participants to continue with the scheme rather than to use it as a means to return to work; problems with management of health and safety, and the quality of service offered by the local authority (Assenti Research, 2007). Nevertheless, by providing a context for regular, positive and active engagement with the woodlands around Drumchapel, the scheme is re-connecting participants and the wider community with local greenspaces. This is perhaps its most important and positive development impact:

“My wish is for the Greenwork Mates to be continued as the benefit to people’s health and well-being is very important and should be used as an example to other like-minded groups.”

“I feel like I am making the environment better for everyone” (Greenwork Mates graduate).

Activities and practices both create and express a sense of local identity and local ownership. Regular volunteers, for example, place great value on the signs of their own labour, showing strong attachment to, and pride in, the symbols of the energy, time and effort they have invested in improvements to ‘their’ forests. Excited exhortations to ‘come and see what we’ve done’ are a good example of the re-appropriation of a local resource, marking a transformation of the woodlands from a symbol of social exclusion into a highly valued community asset.

As discussed in sub-section 3.2, forest-based initiatives in Glasgow are increasingly used to address issues of ill health and health inequality. Health is now widely recognised as the fastest-growing sub-sector of ‘Forestry for People’ activity in Glasgow. Key initiatives such as local groups of the Paths to Health programme, a pioneering system of ‘social referrals’, and a number of popular volunteering programmes are having important, positive impacts for participants from the Drumchapel and Castlemilk areas. These impacts include improvements in physical and mental health, improved general fitness and faster recovery from injury, operations and trauma, increased self-confidence, and faster recovery from diagnosed mental health problems.

3.4 'FORESTRY FOR PEOPLE' AS PARTNERSHIP

BACKGROUND

In addition to the social capital within community groups that is mobilised and enhanced through the delivery of forest-related social benefits (Putnam's 'bonding' social capital), research in both case study locations revealed evidence of a rapid extension of linkages between community groups and expanding networks of external delivery partners (evidence of Putnam's 'bridging' social capital). The case study findings also suggest that partnership working, and the production of bridging social capital, is itself of value to the Scottish population. This is because partnerships themselves provide the basis for the delivery of a wide range of socio-economic and cultural benefits of the kind described in sub-section 3.2. They act as an important 'foundational' asset upon which multiple and varied public goods can be developed. The rapid and extensive growth of partnership working points to a new, outward-facing and collaborative dynamic that can be used to characterise community forestry relations, calling, perhaps, for a re-definition of community forestry in Scotland.

Community woodland groups are not the only forestry stakeholders to provide evidence of this expansion of partnership working. Woodlands under FC, local authority and private ownership are also increasingly used by partnership networks to service the needs of an expanding constituency of clients. Working with health care, education and recreation providers enables public and private forest owners to deliver social benefits to a wider population, while at the same time fostering a valuable network of support for the development and maintenance of woodland resources. In this sub-section, evidence of the rapid rise in partnership working is presented. In addition, examples are drawn from each case study location to highlight the foundational qualities of partnership working.

PARTNERSHIP IN THE LOCH NESS REGION

In the Loch Ness area, an ability to foster strong partnerships is a key factor in the successful delivery of both community-based projects and the initiatives co-ordinated by the public sector. The extensive nature of partnership working is indicated by the fact that representatives of nearly every respondent organisation interviewed could readily list large numbers of partners with whom they work on a regular basis. For example, the Great Glen Way Partnership, which is primarily a result of collaboration between public bodies such as Forest Enterprise Scotland, British Waterways, Scottish Natural Heritage and the Highland Council, also has partnership agreements with many communities organisations, such as community councils and community development companies. Interviews with members of the Abriachan Forest Trust also yielded a long list of delivery partners, including the Rural Community Gateway, Pathways to Health, LEADER, Kellogg's Challenge Fund, Highland Environment Network, British Trust for Conservation Volunteers, Careers Scotland, LANTRA, Glen Urquhart High School, Highland Council, the Eco-Schools network, Forest Schools, Community Woodland Association, Scottish Environment Protection Agency, Lochaber Environment Group, Vital Spark, Scottish Natural Heritage, and the Royal Horticultural Society. Respondents from other organisations also highlighted the pivotal role of partnership working:

"[partnerships are the] way things are accomplished here" (Highlands and Islands Enterprise officer).

"I think the networking thing is quite an important role that I have got. There is quite a range [of community partners I work with]... it can be anything from Abriachan Forest

Trust who are quite well set up through to... local heritage groups, rural associations... down to mothers and toddlers groups” (Highland Council Ranger).

Partnership working in community woodlands around Loch Ness has become an essential factor in the delivery of projects and initiatives that are sustainable in the long-term. This reflects a fundamental characteristic both of the wider rural development model practised in the area and the funding environment within which community woodland groups have traditionally operated. While funds for the acquisition of woodlands and initial capital costs were available through the Scottish Land Fund (administered by Highlands and Islands Enterprise in partnership with the Scottish Government), funding to meet ongoing operational and management costs have been difficult to acquire. The long-term success of surviving community ventures can almost invariably be attributed to funding and support acquired as a result of forging collaborative arrangements with a much wider range of delivery partners:

“Earning money is quite difficult, you have got to break out contracts from public agencies which don’t want to do it... you have got to build, and take risks. Communities don’t like taking risks” (former AFT board member).

Interestingly, the value of partnership working does not indicate a dependency upon external support networks that is particular to community-based organisations. Rather, respondents from public bodies revealed that this dependency can work both ways, emphasising a growing dependence within the public sector upon community partners who are increasingly best placed to access new funding and to capture vital revenue streams from service provision. Members of the Great Glen Way Partnership, for example, confirmed that communities are often more successful than public bodies at raising sustainability funding from endowments (community benefits from wind farms and hydro developments) or development funds from the Scottish Government and NGOs:

“If they [FCS] haven’t got the money [for development] they are going to have to make some sort of relationship with the community so that we can hunt up the money together” (Highland Council Councillor).

Partnership working now provides a foundation for the community woodland groups working in the area to sustain their delivery of social benefits to the wider regional population. This foundational quality comes in part from the fact that it is only by working with other agencies and service providers that they have been able to generate use-revenues from the delivery of services within their woodlands. However, beyond the financial capital secured, partnership working also provides a framework for the development of the social capital necessary to deliver these services, in the form of individual skills, experience and connections. Therefore, partnership, or bridging social capital, which is a form of public benefit in its own right, also leads to the creation of other social benefits in the form of human capital (skills, experience, contacts), collaborative working within groups (bonding social capital), and the actual delivery of forest-related social benefits (education, recreation, health, livelihoods).

Multiple linkages between delivery partners seems to be particularly advantageous in a rural setting like Loch Ness, where public use is rarely limited to individual types of land-based resource. For example, one family’s weekend visit to the area might involve activities in forests, the open countryside, waterways, and formal heritage or other visitor sites. As such, partnership working between those responsible for each resource actually reflects the diverse nature of the public’s consumption of the countryside. In the words of a Great Glen Way ranger:

“Each of the organisations do their own thing, but in the Initiative they have realised it is productive to join forces because all of the visitors are the same. And they enjoy sailing, walking, cycling... and there are routes and facilities for all of that. There are a surprising number of businesses based on the Ways... we didn’t realise just how important that was until we had Foot and Mouth in 2001. We had to close the forest for the first time ever. We realised through the number of phone calls we were getting on a daily basis, how reliant people were to access to the forest from the canal based activities. People moving through the Glen but relying on more than just one form of activity, or service provider” (Great Glen Way ranger).

In summary, in the Loch Ness area, there is a very close relationship between the development of community capacity and the emergence of wide networks of collaborative working. As given in sub-section 3.1, organising a community around a forest resource builds bonding social capital within the community. In addition, bridging social capital in the form of linkages with external networks is increasingly necessary for the sustainable delivery of forest-based services to the wider public. Furthermore, bridging social capital is equally important for those public and private organisations with whom communities are increasingly forming links. The social capital gains made through processes of collaborative working are of a foundational nature and, as such, they represent values that are transferable not only to the public via the delivery of forest-based initiatives, but to the wider sector of public service delivery. As such, it seems reasonable to suggest that partnership working is leading to a reconfiguration of community development and the generation of public goods in rural areas like Loch Ness.

PARTNERSHIP IN THE GLASGOW AND CLYDE VALLEY REGION

As discussed in sub-section 3.2, the management of the community woodlands within Drumchapel and Castlemilk (Drumchapel Woods and Castlemilk Park) relies heavily upon the social capital within neighbouring communities. Successful project delivery in Drumchapel, for example, is dependent upon local residents to provide an engaged team of participants and, crucially, a reliable team of volunteers to carry out day-to-day management tasks. However, projects like the Drumchapel Greenwork Mates also rely on dynamic partnerships between the community and networks of external delivery partners (in this case, the FC and the Glasgow West Regeneration Partnership). As such, as is the case in Loch Ness, there is strong evidence to suggest that partnership working, and the bridging social capital resulting from it, are important to the delivery of ‘Forestry for People’ benefits in Glasgow.

As detailed earlier, many communities within the Glasgow area have experienced a long history of multiple deprivations attributable to industrial decline, and made worse by poor planning and service delivery. Glasgow also has a long history of attempts to regenerate these communities through a range of social, environmental and economic measures. One feature which stands out has been the innovative use of partnerships between public bodies and communities in the design, financing and delivery of a wide range of regeneration programmes and projects. To a large extent, this can be seen as a situation coming from the large public housing sector in the city, and the need to invest in improvements to the built environment. In this context, a narrow focus on bricks and mortar has been seen as a blunt instrument for improving quality of life for residents of deprived communities. It is now generally accepted that, in order to see real improvements in general well-being, people themselves need to be directly involved in decision-making, priority-setting and programme delivery (Glasgow CPP, 2005).

The principles of partnership working now underlie virtually all aspects of public service delivery in the city, and there is a strong emphasis on re-creating a sense of ownership,

responsibility and pride within local communities. The management of the city's greenspaces, which falls under the jurisdiction of the Department of Parks and Recreation is guided by these principles, reflecting the emphasis on partnership working within the wider corporate city culture. Thus, forest and woodland spaces are increasingly seen as resources for public service delivery that can be enhanced through partnership working between local residents and a wide constituency of stakeholders.

The density of the networks of partnership working in this field is highlighted by the case study research, which involved a stakeholder analysis of 'Forestry for People' activity in the three sub-regions of the case study area. Figure 19 maps the connections between organisations, initiatives, projects and events that were encountered during the case study research.

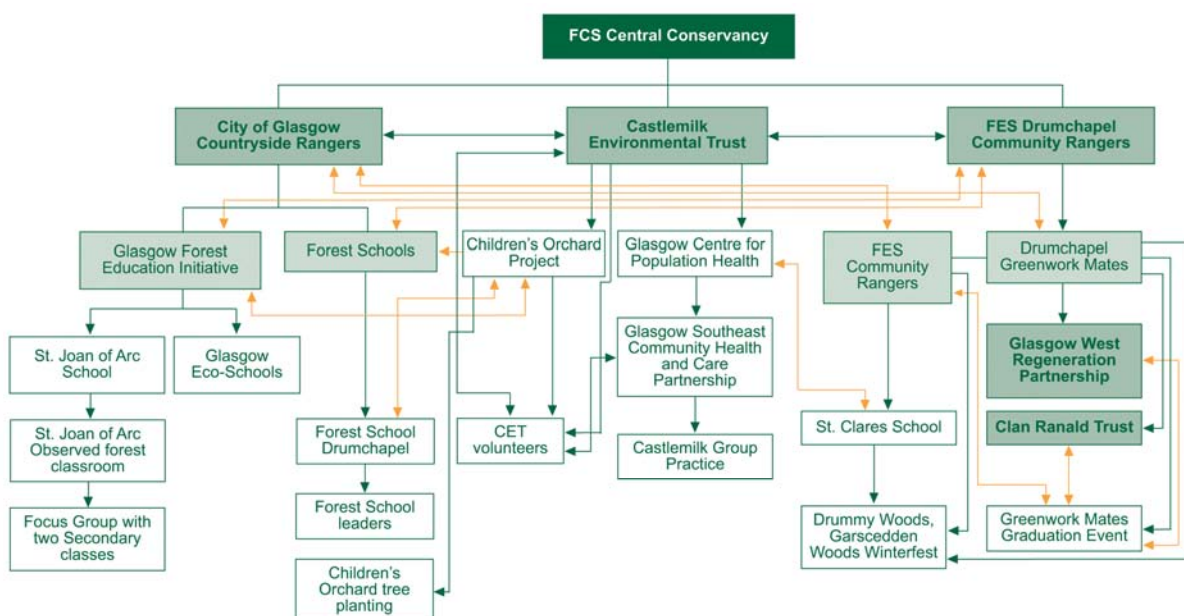


Figure 19. 'Forestry for People' partnerships in Glasgow (Source: Evans and Franklin, 2008)¹¹⁶

Figure 19 shows the density and complexity of formal partnerships and informal relationships in the region that link the four principal actors. The density of connections may be seen as a factor influencing the success of the sector: each connection represents one or more opportunities for the value of resources to be enhanced through collaboration to achieve shared goals. In addition, because there is a client base associated with each partner

¹¹⁶ The green arrows represent direct links and the orange arrows represent indirect links. The diagram also reflects the sampling strategy adopted by the researchers, with Central Scotland Conservancy of FCS appearing at the top as they acted as the initial 'gatekeeper' to other stakeholders. The next level comprises the three main organisations with a 'forestry for people' role in the case study area: City of Glasgow Countryside Rangers, Castlemilk Environmental Trust, and Forest Enterprise Scotland Community Ranger Service in Drumchapel. At the bottom are the four events which were attended as part of the research activities – St. Joan of Arc Special Secondary School forest classes and focus groups; a children's orchard planting event; site visits to Drumchapel; and a Drumchapel Greenwork Mates graduation event.

organisation, each connection may illustrate opportunities to increase the number or range of beneficiaries, for example from public events and other 'forestry for people' initiatives. On the other hand, in situations where partnership working is inefficient, the connections may represent increased transaction costs that could suggest the need for simplifications in the structure of delivery across relevant government sectors.

In conclusion, the case study research highlights a rapid increase in the scale and extent of partnership-working, reflecting a new, outward-facing and collaborative dynamic in Scotland's social forestry sector. Partnerships can be seen as a form of 'bridging' social capital that can have a positive effect on community development and the generation of public goods. They are a key 'foundational' asset that supports the delivery and enjoyment of a wide variety of other 'forestry for people' benefits. Interviews with community development officers in Forest Enterprise Scotland, members of community groups, and those working on various education, recreation and health initiatives highlighted the pivotal role played by partnership working in creating innovative ways to support forest-based activities. In particular, collaboration is seen as an essential mechanism for successfully navigating a route through the complex bureaucratic, legislative and financial environment of public service delivery, and for linking sometimes disparate sources of funding to make projects viable. The high level of activism, enterprise and entrepreneurship encountered by the researchers suggests that 'forestry for people' could be considered in terms of a 'new social movement' – a term that captures the collaborative spirit and sense of purpose that binds partners together in these co-operative ventures.

SECTION 4: CONCLUSIONS AND NEXT STEPS

INTRODUCTION

The most important overall finding of the 'Forestry for People' project is the remarkable range and scale of economic and social benefits that are derived from forests and forest-related activities in Scotland, as outlined in the key findings for each of the seven themes and the two case studies (Sections 2 and 3). Over the last decade the social agenda in forestry has firmly established itself within Scottish forestry, and this is reflected in a greater demand for researchers to evaluate the 'social forestry sector', and assemble the evidence required to assess delivery on wider government agendas such as health, education, culture, and the economy. This report represents perhaps the most comprehensive response to this need in Scotland, and it is hoped that it will provide a valuable resource for policy makers and researchers for the next few years, and also a model upon which similar valuations might be based.

This final section outlines the main areas of research that would need to be carried out to strengthen the estimates derived for the indicators and to build on the case study findings. Further recommendations under all of the seven themes are given by CJC Consulting in their report commissioned by the project (CJC Consulting, 2006). The themes are considered below, with 'employment and volunteering' and 'contribution to the economy' considered together under the heading 'livelihoods'. These proposals are provisional, and have been prepared as a basis for further discussion on how to refine social and economic research agendas in the light of the information presented in this report.

LIVELIHOODS

Numbers employed: The estimates for total numbers of people employed in different forestry sub-sectors (Indicator 1) were derived in most cases by applying ratios to the corresponding estimates for FTEs. The choice of ratio for each sub-sector was based partly on expert judgements due to the lack of data, and their accuracy is not known. More accurate employment data would be required to improve upon these estimates, which would necessitate a survey of forestry employment either for those sub-sectors for which ratios are apparently least robust or for the sector as a whole.

FTEs and GVA: If such a further survey of forestry employment were carried out, it could also (or instead) be used to estimate direct FTEs in different forestry sub-sectors in Scotland. Current estimates for this (Indicator 2) are largely based upon data from the Forest Employment Survey which was carried out nearly ten years ago in 1998/99. Also, the estimates would benefit from data that was more readily compatible with the needs of the Input-Output analysis that would be required to derive new values for indirect and induced FTEs. There is also a need for better information on the extent to which the Annual Business Inquiry under-represents total employment due to the exclusion of the smallest businesses that are under the VAT threshold, and the self-employed. These steps would also allow the corresponding estimates for GVA to be improved upon (Indicator 8).

Regarding FTEs and GVA related to, and associated with, visitor spending (Indicators 3 and 7), estimates would be improved by research that generates new data for spending associated with overnight stays by Scottish residents carrying out tourism and recreation in Scotland. The estimate for visitor-associated spending is currently very approximate, and

improvements would require further survey work to establish to what extent spending on visits to the wider countryside in Scotland can be attributed to the influence of woodland on trip destination even though woodland itself is not visited. Better information on GVA as a proportion of total visitor spending would help improve the GVA estimates.

Game sector: The estimates for FTEs and GVA associated with the game sub-sector in Scotland were based upon data for the UK level. A study of the Scottish game sector could be carried out to identify the levels of employment and GVA, and how much of this can be attributed to woodland. Such a study would benefit from GIS analysis that takes into account the locations of game shooting providers, although it would also be useful to consider the best basis for the attribution of benefits to woodland, e.g. whether indicators such as the proportion of time different species spend in woodland would be a better basis than just using the percentage of land cover.

Non-timber forest products: Attempts to estimate numbers employed, FTEs, and GVA associated with collection and trade of non-timber forest products were based upon studies with small sample sizes for a limited range of products, and more research would be needed to improve upon available data if more reliable estimates were required. However given the small-scale nature of the activities and their questionable legal status in some cases, improving upon existing data sources may be difficult.

Economic regeneration: There is currently insufficient evidence to quantify the contribution of forestry to economic regeneration at the national level, for example through the creation of green infrastructure in industrial or ex-industrial urban settings, and for this reason the topic was not included in the FTE or GVA estimates. New surveys could provide information to derive estimates on aspects such as the influence of woodlands on investment, business location and household location decisions, and this work could be strengthened with use of GIS. However teasing out the additional benefits at national level may be difficult.

Volunteers: The estimates for number of volunteers and volunteer days associated with forestry (Indicator 4) were derived from the F4P Survey of Activities 2007 and are believed to be reliable. They are being used to monitor implementation of the Scottish Forestry Strategy. A decision to repeat the survey in later years to monitor volunteering levels would need to take into account the burden on recipients' time, especially if such a survey was broadened in scope to respond to the data needs for employment and FTEs identified above.

Time spent on different activities: The time spent working and volunteering on different forest-related activities for each sub-sector was also derived from the F4P Survey of Activities (Indicator 5). However the survey was restricted to organisations that carry out significant levels of social forestry activity, and excluded most private sector companies and landowners. Thus it is not possible to derive an accurate estimate of the proportion of time spent on different activities for the entire forestry sector. A decision to run the survey again to cover the private sector more thoroughly would need to consider the risk of overlap with other surveys carried out by FC and the overall burden on recipients' time.

Job satisfaction: To improve upon our understanding of job satisfaction in the forestry sector (Indicator 6), a standard survey could be carried out that allows comparison between types of employee and types of employment for different sub-sectors, for example between parts of the private and voluntary sectors. The project did not assess the skills base within the forestry sector, and research in this field could be linked to a study of job satisfaction to improve knowledge of recruitment and retention policy within the forestry sector. The research could include under-represented groups to provide the evidence required by the

public sector and its partners to assess levels of staff recruitment and retention according to gender, age, disability and ethnicity.

RECREATION AND ACCESSIBILITY

Numbers of visitors and visits: Estimates for numbers of visits and visitors to forests (Indicators 10 and 11) are now able to draw on a large body of evidence from several surveys in Scotland (reviewed under sub-section 2.3). The major gap in the data concerns visits by children. The estimates given in this report are based on the F4P Omnibus Survey 2007 which could only ask adults to respond on behalf of their respective children (or those under their care). For a more complete coverage, a method to estimate numbers of children visiting woodlands, unaccompanied and accompanied (including school or nursery trips), would need to be devised and carried out.

Economic value of recreation: Regarding the non-market valuation of visits to forests given in Indicator 12, improvements would require new willingness to pay figures for different types of visitor and activity in forests that can be said to represent the range of types of forest in Scotland. (Estimates by Christie *et al.*, 2006 were based upon destinations at the higher end of the scale in terms of recreation provision.) A related problem arises with the economic value of children's visits, which is a relatively untouched area of valuation with methodological challenges since their willingness to pay figures may be quite incompatible with those derived for adults. A related research question that could contribute to other non-market values in this report would be to assess how valuation of access to forests by adults was influenced by the amount of time spent visiting or playing in forests when they were children (see Ward Thompson *et al.*, 2004 and 2006).

LEARNING AND EDUCATION

Organised learning activities: The data presented under this theme (Indicators 15, 16 and 17) is drawn largely from the results of Omnibus surveys, and did not present any methodological difficulties for the project. The valuation of education initiatives such as Forest School has been carried out largely through qualitative methods as reported in Section 2. A helpful addition to these evaluations would be the use of longitudinal studies to track attainment, including educational attainment, in participants over a period of time.

Economic value of education: No indicator was included in the project to assess the economic value of learning and education in woodlands, and new methods could be developed and studies carried out to address this gap.

Public perceptions of forests: Work on the impact of formal education and informal learning on attitudes and behaviour towards forests and the services that they provide could be carried out to complement the data given under Indicators 16 and 17.

HEALTH AND WELL-BEING

Levels of exercise in woodlands: As with learning and education, the data derived from Omnibus surveys presented few methodological difficulties, although there is a need to improve the evidence base of differential benefits for some socially excluded groups, in particular for members of black and minority ethnic groups since their low incidence in the population reduced their representation in the sample. Also it would be valuable to explore

perceptions and behaviour of that sub-class of the Scottish population who visited or exercised in woodlands during the previous 12 months for the first time.

Economic value of health benefits: There is a need for a better evidence base for the health benefits of woodland including the timeframe within which health benefits of exercise arise, i.e. whether they are short-term or long-term, to improve estimates for Indicator 19. This information would inform the choice of approach to economic valuation. If the effects are immediate, there is the additional question of how long the benefits would last for, and whether individuals who have had positive recreational experiences in woodland (for example when they are young) then develop a habit of visiting woodlands that effectively lengthens the timeframe of the health effect.

Mental health benefits: Research is needed to establish more precisely how woodland visits impact on mental well-being (Indicator 20), i.e. whether, and to what extent, they can contribute to prevention, effective management or to cure. Since 1 in 10 people in Scotland are estimated to suffer from depression and anxiety, the positive impact for each individual need only be relatively small for the aggregate value to be substantial. Further research could assess the types of people (e.g. certain age groups from deprived urban areas) and types of woodland visit, which have the greatest impact in order to target resources most effectively.

CULTURE AND LANDSCAPE

Cultural values: Work on how people value ancient (including veteran, heritage and champion) trees would be useful to complement qualitative assessments which suggest that people may value visits that include seeing such trees, or other cultural and aesthetic sites and features in woodland, much more highly than other visits that do not encounter such features. There is also a need to develop new methods to categorise and assess intangible cultural values associated with woodlands such as sense of place and identity, and also the benefits of woodland-related arts and other cultural events and activities, to go beyond the narrow quantification of numbers of cultural sites that is often used to assess 'cultural heritage' in the forestry sector (Indicator 22).

Landscape values: The viewshed analysis used for Indicator 23 to estimate the value of forest landscapes to the Scottish population could be developed further. A more sophisticated approach could be adopted to identifying uninterrupted views if building profile data becomes available, and to the estimation of numbers of households with views of inner city woodland. The analysis could be extended to include smaller woodlands and street trees. Also, more recent census data and urban boundary data could be used, and the new National Inventory for Woodland and Trees which will be available from 2010, will give the inventory by woodland type. Estimates could also be improved by a study of Scottish residents' preferences (or willingness to pay) for different types of woodland view, to investigate how these vary spatially (e.g. with proximity to the woodland), and the extent to which values differ between inner city and peri-urban woodlands. Research into public preferences for different forest attributes, both silvicultural (stand age, density, structure, tree species composition) and non-silvicultural (recreational infrastructure and services) could strengthen the analysis, as well as provide a basis for modelling the impacts of changes in forest management on recreational use of forests.

COMMUNITY CAPACITY

Assessing community woodlands: The F4P Survey of Activities provided much new data to assess the community woodland sub-sector in Scotland, for example on the numbers of groups and members, hectares managed, and the level of income from different sources both now and predicted in the future (Indicators 26, 27 and 28). It would be valuable to continue with this part of the overall survey and establish a database that could aim for a 100% response rate and be updated regularly. Also, similar research could focus on WIAT initiatives.

Community capacity and social capital: Attempts to assess community capacity benefits of participation in woodland-related initiatives, such as community woodland groups (Indicators 26-30) would benefit from case study research and literature review to clarify definitions of key terms (such as capacity, cohesion, social capital, trust and sense of belonging) and the causal links between them as a step towards identifying tangible measures of the capacity of communities to mobilise and build upon latent skills and work together towards shared goals. This research could be linked to an evaluation of the National Forest Land Scheme.

CONCLUDING REMARKS

To achieve a comprehensive valuation of 'forestry for people' benefits in Scotland, a number of challenges remain, which cross over the seven themes that structure the findings presented in this report. The project has only assessed the positive contributions of forestry for people, whereas there are a number of disbenefits that could be assessed as part of follow up research. Examples include the risks associated with mountain biking, and with falling trees, and the carbon emissions associated with transport to, from, and within forests as part of different forest-related activities.

There is also a need to improve the quality of data available to assess benefits for different social groups, in particular for children, for people with disabilities, and members of black and minority ethnic groups. Further work is also needed to strengthen the contextual information available to allow more meaningful interpretation of the results, in particular by providing data to show trends over time, and by comparing social and economic values for woodland with other competing kinds of land use. Use of spatial datasets and GIS could contribute new information on all of the 'forestry for people' themes in this study, and on cross-cutting issues relating to differential participation and impacts upon different social groups. The implications of adopting different theoretical frameworks allowing for changing preferences and values could also usefully be explored, for example a framework such as the theory of 'volitional pragmatism', whereby individuals 'work out' what they want as they come to understand the choices available to them (Bromley, 2006). This approach contrasts with more conventional ones based upon fixed preferences and tastes upon which standard economic theories are generally based, including valuation methods drawn upon in this report.

Finally, the task of integrating the economic and quantitative approach presented in Section 2 with the qualitative methods used in Section 3, to provide a more holistic synthesis of 'forestry for people' benefits, remains largely unrealised. One way forward would be to conduct case studies that systematically quantify and describe use and non-use of particular woodlands for different purposes by different kinds of people. Such studies could monitor changes over time. They could focus on a key agenda such as economic regeneration, or aim to cover the full range of 'forestry for people' benefits in specific locations that allow generalisations to be made about the national picture in Scotland. The approach could also

be broadened to include other types of benefits (e.g. option and existence values), or wider environmental benefits (e.g. carbon sequestration) associated with Scottish woodlands.

It is hoped that these possibilities, and others, will be considered as part of discussions over the coming months, both within and beyond FC, to take forward the research presented here and to strengthen the social and economic research agenda in support of the Scottish forestry sector.

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APPENDICES

APPENDIX 1: INPUT-OUTPUT ANALYSIS AND PREVIOUS FTE AND GVA ESTIMATES

This section provides some background to Input-Output (IO) and multiplier analysis.

Definitions

The existence of interdependencies among sectors in IO analysis (whereby sectors use each other's outputs as inputs) is the major cause of the multiplier effect. The multiplier effect reflects the fact that, for example, a unit increase in employment in one sector causes more than a unit increase in employment in the whole of the economy.

There are different types of multipliers. Type 1 (or 'open model') multipliers account for direct and indirect effects taking household incomes as given (i.e. exogenous). Type 2 (or 'closed model') multipliers account for direct, indirect and induced effects by making household incomes endogenous.

The original IO problem yields the solution for equilibrium outputs (X) that satisfy the predetermined final demands (F) in terms of the inverse of the Leontief matrix of technical coefficients (A), also called the direct requirements matrix: $X = (I - A)^{-1} \times F$. Changes in the final demand (ΔF) causes changes in output (ΔX) and the inverse can be represented as power series:

$$\Delta X = (I - A)^{-1} \times \Delta F = \Delta F + A \times \Delta F + A^2 \times \Delta F + A^3 \times \Delta F \dots$$

This power series expansion shows that the effect of changes in final demands can be presented as a series of changes propagating through the IO system just like a drop of water falling into a still pond causes a series of ripples: infinite but decreasing in magnitude. Consider, for example, an increase of 10 units in final demand. The first term of the series shows that output changes are equal to direct material input changes (ΔF) but there are more aspects to it. The second term ($A \times \Delta F$), often referred to as 'the first round effect', yields the output generated in the production of the direct material input requirements. The further terms of expansion yield the output generated in the production of the indirect requirements. When the households' income is endogenised these terms will include the induced effects as well. It is important to note that since each element in the direct requirements matrix (A) is less than one, each 'ripple' term is smaller than its predecessor. In practice the series converge quite fast, often less than ten terms need to be calculated to approximate the Leontief inverse matrix, $(I - A)^{-1}$, very closely.

Additionally, depending on the economic problem under investigation, the IO model solution can be demand- or supply-driven. In the demand-driven solution, the model is solved for gross outputs given the levels of final demand. Here the demand for inputs, both direct and indirect, creates the multiplier effect with backward linkages at work. 'Upstream effects' is another name used, in this case when suppliers are mainly affected. The main assumption here is that of fixed input coefficients. Notice that impact analysis is synonymous with the demand-driven model solution.

In the supply-driven solution, the model is solved for gross outputs given the levels of primary inputs. Here the changes in the level of output from one sector influence the production in

other sectors through inputs. The supply of inputs, both direct and indirect, creates the multiplier effect with forward linkages at work. 'Downstream effects' is another name used, in this case when consumers are mainly affected. The main assumption here is that of fixed output coefficients.¹¹⁷

Therefore, the multiplier analysis results derived from two different model solutions (upstream and downstream effects) answer different research questions and should not be added, but presented separately.¹¹⁸ Studying the hypothetical removal of the sector allows accounting for both effects.

Review of previous forestry studies

Since many newer studies refer to and build upon older ones, studies are reviewed in chronological order starting with McGregor and McNicoll (1992). This was a pioneering study of the UK and its member countries' forestry that used a Leontief intranational IO model. It deals primarily with total sector impact estimation and critical supply dependency.

McGregor and McNicoll estimated the impact of forestry as a whole by comparing two estimates of gross sectoral outputs: the actual for 1984 and the hypothetical derived from the IO model where domestic UK forestry is completely absent. The approach allows accounting for the effects of backward and forward linkages. This was done by a complete suppression of forestry in IO tables. Initially 100% import substitution was assumed for industries using forestry production as inputs. Then analysis was further augmented by allowing for the critical supply-dependencies of domestic timber-using sectors (2% for paper, pulp and board and 21.6% for timber processing) through the proportional suppression of relevant industries in addition to the core forestry sub-sectors of planting and harvesting. The results show a contraction of output and household income for both cases with and without critical dependencies (see Table A1). How the forest sector was defined is not entirely clear, but its definition can be classified as 'broad' in covering planting and harvesting, timber processing, and pulp and board. The main task in this study was to separate forestry from fishing in the 1984 IO tables. All results in the paper are reported at an aggregated level of one-digit SIC codes.

The next large study is by Roberts *et al.* (1999). This concentrated exclusively on Scottish forestry and is the most extensive and rigorous study among those reviewed. Presentation of their results emphasises the marginal nature of multiplier analysis. Sub-sectoral multipliers are given, with the overall impact of the sector estimated by hypothetical extraction rather than by summation over sub-sectoral multiplier effects. Their simulation of the total suppression of the forestry sector for Scotland follows similar lines to McGregor and McNicoll (1992). The study results for the closed model solution (i.e. with induced effects) are given in Table A1. The corresponding estimated decrease in employment is 6,906 FTEs and 12,130 FTEs respectively. The higher estimates compared to McGregor and McNicoll (1992) may be explained by more detailed accounting for the forestry sector, going beyond forest nurseries and harvesting/extraction to also include establishment, maintenance, road construction and other forest activities.

The study by COGENTSI and PACEC (2004) is based on the 1997 IO tables and uses a conventional IO modelling approach. The forestry sector is defined as comprising the following key activities: nurseries, establishment, maintenance, construction (roads),

¹¹⁷ Generally the supply-driven Input-Output model is not favoured in academic circles because of weak economic foundations for such causality, see, for example, Oosterhaven (1988 and 1989).

¹¹⁸ As in Roberts *et al.* (1999: 31 and 41-44, Tables 6.3, 6.4 and 6.6).

harvesting, and other non-forest activities, with many of these disaggregated further. To avoid double counting the study excludes sales and purchases among forestry sub-sectors from the analysis.¹¹⁹ After this correction, type I and type II multipliers are calculated as ratios of the total effects to the direct effect.¹²⁰ The magnitude of the multipliers derived is comparable to other Scottish studies. For forestry employment estimation the following figures are reported for Scotland: 14,619 direct FTEs and 3,074 indirect FTEs.¹²¹ However, GVA estimates for GB constituent countries are not presented.

The last study reviewed (CEBR, 2006) is based on the 2003 IO tables and concentrates on time-series trends in forestry during 1997-2005 using constructed IO tables for years where true tables are unavailable. Forest industries include: forestry, logging and related activities (SIC 02.01 and 02.02); the manufacture of wood and wood products (SIC 20.10, 20.20, 20.30, 20.40 and 20.51); pulp, paper and paperboard (SIC 21.11 and 21.12); and paper and paperboard products (SIC 21.21, 21.22, 21.23, 21.24 and 21.25). The study considers direct, indirect (upstream – immediate suppliers of goods to forestry, and downstream – immediate consumers of forestry products), and induced (employee spending) effects of forestry. However, only the first iteration (or ‘first round effect’) is considered, rather than a full IO solution. The methodology for calculating the multipliers is not described in detail.¹²² The estimated impact of the forestry sector (broadly defined) is given in Table A1.¹²³

In contrast to the current study, the estimates of impacts of forestry (variously defined) include use of imported timber. The FTEs and GVA are totals for forestry as a whole and include indirect and induced effects where appropriate.

Summary and conclusions

Multiplier analysis provides a useful tool for an impact assessment of small, marginal changes in the economy, but when an aggregated sector multiplier is sought analysis should not proceed by simply adding the constituent sub-sectors’ multiplier effects.¹²⁴ The multiplier for the aggregated forestry sector, when necessary, should be derived as a new IO solution, where the aggregated sector is used in an adjusted IO matrix.¹²⁵ Otherwise, one has to deal with the problem of double counting (as done in the current study) by excluding effects within each of the constituent sub-sectors themselves.

¹¹⁹ Although this may be important when investigating economic contributions of various segments of the disaggregated forestry sector, it may be irrelevant if the economic impact of the forestry sector as a whole is estimated by the method of hypothetical sector extraction, for which analysis based upon multipliers estimated with the sector included may be methodologically inappropriate.

¹²⁰ This approach is used in Tables 2.1, 2.6, 2.8, 2.10 and others. However, it is not entirely clear what is primary: the output/employment/GVA numbers obtained as solution from the IO model and then used to derive the multipliers as simple ratios, or the multipliers themselves derived from the Leontief inverse.

¹²¹ COGENTSI and PACEC (2004: 58 and 61).

¹²² However, CEBR (2006: 62) states: “For the upstream multiplier we looked at how much the forest industries spends on upstream industries (on a domestic basis only) as a proportion of the total output in these industries and then used these proportions to calculate the resulting earnings, profits, and GVA supported by spend of the forest industries on its inputs.”

¹²³ Summing upstream, downstream and forestry’s employee spending effects and reflatting the results in CEBR (2006: 38, 46 and 49; original GVA value is £ 717 million at 2005 prices). These figures do not include their estimate of the direct value of forestry itself: 18,500 FTEs and £1,020 million of GVA at 2007/08 prices (original GVA value is £960 million at 2005 prices, CEBR, 2006: 24).

¹²⁴ This is because this fails to address the problem of double counting. The problem of double counting arises when indirect and induced effects in each of the constituent sub-sectors are added to the totals.

¹²⁵ Naturally, the multiplier estimates will vary depending on how the forestry sector is defined.

When the issue is the total sector impact as a whole on the economy, the methodology of the hypothetical sector extraction, described in the review of previous studies, appears best suited. The main limitation for the credibility of the analysis of the hypothetical sector removal is the assumption that the removal of the sector does not affect the residual structure of the economy and intra-industry linkages,¹²⁶ which is unlikely to be true. However, estimating impacts taking structural change into account is difficult as it would require a totally new approach along the lines of computable general equilibrium modelling.

Table A1. Summary of findings from Input-Output studies in Scotland

Study	FTEs	GVA, £ (million), 2007/08 prices	Comment
McGregor and McNicoll (1992) ¹²⁷	N/A	215	No critical dependence
	N/A	346	With critical supply dependence
Roberts <i>et al</i> (1999) ¹²⁸	6,906	281	No critical dependence
	12,130	515	With critical supply dependence
COGENTSI and PACEC (2004)	17,692	N/A	Sum of direct and indirect, 1997 data
CEBR (2006)	19,444	761	Sum of up-stream, down-stream and induced effects

Source: Studies' original estimates and own calculations

¹²⁶ Roberts *et al.* (1999: 39).

¹²⁷ Original output contraction values are £ 203 and 326 million at 1984 prices, McGregor and McNicoll (1992: 76-77). GVA was computed as 46% of output. This share is estimated from Scottish IO Tables for 1998.

¹²⁸ Original output contraction values are £ 443 and 812 million at 1995 prices, Roberts *et al.* (1999: 39-40). GVA was computed as 46% of output. This share is estimated from Scottish IO Tables for 1998.

APPENDIX 2: AGGREGATION ISSUES

A variety of methodologies are used by economists to put a monetary value on market and non-market benefits. Each method has its own strengths and weaknesses and relies upon specific assumptions.

Direct methods of estimating non-market benefits directly ask individuals to state their preferences for environmental services. Such valuation methods include various forms of contingent valuation (CV) designed to elicit willingness to pay (WTP) for an increase in quantity/quality of environmental services, and/or willingness to accept (WTA) compensation for a decrease in quantity/quality of environmental services. They also include generalised stated preference methods where individuals are asked to rank a list of environmental options or to choose between two cases.

Indirect methods (also called revealed preference approaches) deduce individuals' preferences for environmental services by observing individuals' actions in related markets. Such methods include the travel cost method (which makes use of the fact that consumers reveal their preferences in valuation through actual observable travel behaviour), and hedonic price methods (which value amenities through their impact on prices of related market goods and/or services such as housing).

Aggregating values obtained by different methods for the forestry sector as a whole presents several challenges. These are discussed in more detail in Snowdon and Willis (2004). First, unless substitution effects (e.g. between recreation sites within and outside forestry) are taken into account, WTP and other methods of valuing non-market benefits can overstate the benefits of forestry. Second, a part-whole bias (i.e. value of the parts exceeding that of the whole when elements are valued individually) also tends to lead to overvaluation¹²⁹. Third, the value of intra-marginal benefits (e.g. if total benefits of forestry rather than marginal benefits are required) is normally larger than that of marginal benefits, hence, extrapolating marginal values along the demand curve will undervalue forestry. Fourth, distance-decay often affects non-market values (typically local non-use values decline with distance), so, unless this is taken into account, mean values for the population as a whole obtained by extrapolating from surveys of WTP can be overstated. Fifth, determining the populations of relevance (e.g. over which to aggregate non-use benefits or estimate recreational benefits where the recreation market is segmented into different groups) is linked to the sample selection bias and to the fact that for some groups the WTP can be zero. In addition, in evaluating net benefits (not addressed in the current study), the question of what 'with-without' scenario or counterfactual to use (e.g. the land use cover that would pertain in the absence of forestry) can affect the valuation of forestry benefits in any direction.

Given the methodological problems, some bodies have recommended systematic adjustments to values estimated. None have been incorporated in the current study. In the 1990s, for example, the US National Oceanic and Atmospheric Administration suggested deflating CV results by 50%.¹³⁰

¹²⁹ Hoehn and Loomis (1993) report a 27% overstatement of benefits when aggregating over two independent programmes and 54% overstatement in the case of three programmes.

¹³⁰ As reported in Hanley *et al.* (1997: 400).

APPENDIX 3: SAMPLE QUESTIONNAIRES USED FOR THE SURVEY OF ACTIVITIES

A) Community Woodland Groups:

Full questionnaire used for community woodland groups, including appendix with definitions of forestry-related activities used throughout this report

B) Forestry Commission:

Table used to record public events organised by Forestry Commission Scotland (the first of three pages)

**APPENDIX 3(A):
SURVEY OF ACTIVITIES IN SCOTLAND 2007 – COMMUNITY WOODLAND GROUPS**



Scope of survey

This questionnaire is intended for community groups and organisations, which are actively involved in the management of woodland in Scotland. If it has been sent to you in error, please accept our apologies. Please put a cross in this box, ignore the other questions, and return this form in the freepost envelope provided. Thank you.

All data provided will be treated in the strictest confidence and will be aggregated with data from other respondents so that it will not be possible to identify an individual respondent in any publication or other report. However if your information could help Forestry Commission Scotland in other ways, or other organisations concerned with forestry policy in Scotland, it would be helpful to have your permission to share your information. Are you content for your information to be made available? (Please tick one of the following boxes):

- a) YES, make my response, and names and addresses all available
- b) YES, make my response available, but not names or addresses
- c) NO, ensure that all my information is confidential

Name of organisation:

Address:

Post Code:

Telephone:

E-mail:

Contact for enquiries:

Telephone:

E-mail:

Estimates are acceptable for all questions. 'If 'Nil' response to any question, please enter '0'.

Please return this questionnaire to:
F4P SURVEY, FOREST RESEARCH,
NORTHERN RESEARCH STATION, ROSLIN, MIDLOTHIAN EH25 9SY
A freepost envelope is provided (no stamp required)

1. How many employees, contractors and volunteers do you have, whose work is partly or entirely related to forestry or woodlands in Scotland? Figures can be for the latest year available, or for what is thought to be a typical year. Please break down the total number into direct (i.e. employees for whom you are responsible for paying wages and National Insurance contributions), contract (i.e. any others undertaking paid work for your organisation), and volunteers (i.e. unpaid work).

	Direct	Contract	Volunteers
Number of people:			

2. How much paid employment (in PERSON-YEARS) do you have that is related to forestry or woodlands in Scotland? Figures can be for the latest year available, or for what is thought to be a typical year. A 'person-year' is equivalent to one person working full-time for a year, i.e. approximately 225 working days. Include a rough estimate of time for those who work a part-year on forestry or woodlands (e.g. count a full-time employee working slightly more than half the time on woodland as 0.6, or an employee who works part-time for 4 months in the summer as 0.2).

	Direct	Contract
Person-years:		

3. How much voluntary work (in VOLUNTEER-DAYS) do you have that is related to forestry or woodlands in Scotland? Figures can be for the latest year available, or for what is thought to be a typical year. A volunteer-day is equivalent to one person volunteering for an entire 8-hour day (e.g. count a volunteer who works on woodlands for a full day, once a month, as 12).

	Volunteers
Volunteer-days:	

4. What percentage of time is spent on each of the following forestry or woodland-related activities? (See appendix for definitions.) Figures can be for the latest year available, or for what is thought to be a typical year. Each column should add up to 100% (unless it is left blank).

	Direct	Contract	Volunteers
1) Organisational support:			
2) Public involvement:			
3) Woodland management:			
4) Harvesting and processing:			
5) Biodiversity and wildlife:			
6) Recreation and access:			
7) Formal education:			
8) Informal learning:			
9) Health and well-being:			
10) Cultural activities:			
TOTAL 100	%	100%	100%

5. In what year was your organisation formed?

6. How many members does your organisation have?

7. How many directors, committee members, or trustees does your organisation have in total? (See also Question 16)

8. How many woodlands does your organisation own or manage?

9. Please tell us about your woodland (If you have more than one woodland please continue in the 'comments' section below, or on a separate sheet)

1. **Grid reference of woodland** (e.g. NT 123 456. Alternatively, briefly describe the location in the comments section below)

b) **Size of woodland in hectares** (One hectare is about 2.5 acres)

c) **Legal status** (Tick one box; see appendix for definitions)

Ownership

Lease

Management agreement with Forestry Commission Scotland (FCS)

Management agreement with other organisation (i.e. not FCS)*

Informal agreement with FCS

Informal agreement with other organisation (i.e. not FCS)*

*Private organisation, non-governmental organisation, or other public body (not FCS)

10. What is the level of community involvement in your organisation?

(Tick one box; see appendix for definitions)

Community control

Community-led partnership

Agency-led partnership

No control

11. What was the total income of your organisation in 2006?

12. What percentage of your total income in 2006 was derived from the following? (Estimates required only)

Grants from public bodies (e.g. Scottish Executive, National Lottery)	%
Donations from private or charitable organisations and individuals	%
Membership fees	%
Sales (forest products, e.g. timber, non-timber forest products, game)	%
Sales (other goods and services)	%
Other (please specify)	%
Total	100 %

13. What percentage of your income in 2006 was core funding (i.e. not tied to specific projects)?

%

14. What is the scale of funding that your organisation seeks to obtain in total for the next three years? (Tick one box)

- | | |
|-------------------|--------------------------|
| £0 – £10,000 | <input type="checkbox"/> |
| £11,000 – £20,000 | <input type="checkbox"/> |
| £21,000 – £50,000 | <input type="checkbox"/> |
| More than £50,000 | <input type="checkbox"/> |

15. What percentage of your organisation's funding requirements for the next three years has been secured to date?

%

16. THIS QUESTION IS OPTIONAL. Please break down the total number of directors, committee members and trustees in your organisation (given in Question 7) as follows:

a) Gender

Male	
Female	

b) Age

Under 25 years	
25 – 60 years	
Over 60 years	

c) Disability

How many consider themselves to have a disability?	
--	--

d) Cultural or ethnic background

How many consider themselves to belong to the following groups?

(Please select one category per person)

White

Mixed race

Asian, Asian Scottish or Asian British

Black, Black Scottish or Black British

Other (please specify)

Please use the space below to provide any comments, or to complete any of the questions.

Thank you for taking the time to complete this questionnaire. Your feedback is greatly valued. Please tick this box if you wish to receive a brief summary of the results of the survey.

SURVEY APPENDIX

Definitions of forestry or woodland-related activities (Q4)

1. Organisational support: Staff and volunteer training, project management, administration, planning, accounting, fundraising, attendance at meetings, networking, lobbying and media work, which relates to woodland.
2. Public involvement: Activities that encourage public involvement in woodland-related decision-making such as outreach activities, consultations, and Annual General Meetings which are attended by members of the wider public. Does not include public involvement in practical woodland activities.
3. Woodland management: Tree nursery work, woodland establishment and maintenance, non-economic thinning operations, and silvicultural operations to enhance the scenic value of woodlands in the landscape. Does not include work to improve access such as path maintenance, which is covered by 'recreation and access'.
4. Harvesting and processing: Harvesting, production and processing of timber, small wood products, fuel wood, and other non-timber forest products including hunting and fishing. Only activities that involve Scottish timber and products should be included.
5. Biodiversity and wildlife: Woodland-based ecological surveys (e.g. bird or red squirrel surveys) and forest inventories, and management specifically to enhance wildlife e.g. erection of bird boxes and habitat enhancement.
6. Recreation and access: Activities or events that allow or enhance use of woodlands for leisure and pleasure, including creation and maintenance of paths, cycle trails, car parks, visitor centres, and tourism promotion (e.g. interpretation and information).
7. Formal education: Woodland-based formal education activities or events such as school, higher and further education trips to woodlands, and Forest School. Include woodland-related visits to schools and colleges by rangers and outreach officers.
8. Informal learning: Woodland-related learning provided for all ages outside the formal education system, for example guided walks and fungi forays. Does not include staff and volunteer training, which is covered by 'organisational support'.
9. Health and well-being: Woodland-based activities or events that aim to enhance physical health or mental well-being of the population such as health walks, Green Gym activities and Cycling for Health.
10. Cultural activities: Activities or events both inside and outside woodlands that focus on or enhance the cultural aspects of woodlands including arts performances, making sculptures, cultural heritage trips, weddings, burials and other ceremonies.

Legal status of woodland management agreements (Q9c)

2. Ownership: The Community Woodland Group, or appointed representative, has the legal holding of title to the land and, typically, the trees growing on it.
3. Lease: A legally binding agreement between a Community Woodland Group and the woodland owner (or their managing agent). It stipulates the area of land subject to the agreement, the duration of the agreement, and the rights and restrictions conferred on the Group with regard to the woodland for the duration of the agreement.

4. Management Agreement: A formalised mutual understanding between the Community Woodland Group, the woodland owner or their management agent, and possibly another interested third party. This understanding is usually described in a document, agreed to by all parties, which identifies management objectives for the woodland, and prescriptions for specific management requirements and other activities, as well as the body(ies) responsible for carrying out (or ensuring that the activities are performed). The Community Woodland Group may be identified as the lead organisation, or as an active management partner organisation.
5. Informal Agreement: Such an arrangement does not include any of the mechanisms mentioned above for the formalisation of the group's involvement with the woodland. By its nature it is (usually) a verbal understanding between the group and the owner or their managing agent. The level of a group's involvement with the woodland can vary significantly within this framework and can range from direct participation in management planning and management operations to *ad hoc* access to the woodland.

Levels of community involvement (Q10)

6. Community Control: An organisation with democratic membership open to the local community. The majority of directors are elected from local community members, although there may in addition be some appointed directors.
7. Community-led Partnership: Partial local democratic control. While locally elected directors will be the largest single group on the board, there are a significant number of appointees.
8. Agency-led Partnership: A group where there is agency control over the agenda and management board, but where there is an element of local democratic representation.
9. No Control: This includes consultation, informal arrangements etc.

APPENDIX 3(B): FORESTRY COMMISSION: PART OF THE TABLE USED TO RECORD PUBLIC EVENTS

Name or type of event (or brief description)	Number of events of this type in last 12 months	Purpose of event		Number of other partners (excluding FC)	Number of people attending each event (or average number for repeated events). Tick one box								
		Primary purpose	Secondary purpose		1-10	11-50	51-100	101-500	More than 500				
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
					<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Please continue in the comments section below, or on another copy of the questionnaire if necessary

APPENDIX 4: QUESTIONNAIRES USED IN THE OMNIBUS SURVEYS 2006 AND 2007

A) Questions for inclusion in the Scottish Opinion Survey, August 2006

Question number	Question
	<p>The next section is regarding Scottish woodlands. The results of this section will be used only by the Forestry Commission and Forest Research.</p> <p>By Scottish woodlands I mean forests and woodlands with small or large areas of trees, under any ownership, both old and new, and of any type.</p>
1	<p>Have you visited any Scottish woodlands in the last 12 months?</p> <p>SINGLE CODE</p> <p>Yes (CONTINUE) No (ASK ONLY QUESTIONS 3, 8, 10, 11, 12, 13 15, 16, 24 (parts 1+ 5), 25, 26, 27, 28, 29 and 30)</p>
2	<p>Were those visits mainly...</p> <p>READ OUT. SINGLE CODE</p> <p>To woodlands in the countryside To woodlands in and around town Or to both</p>
3	<p>On a scale from 1 to 5 where 1 means that you receive no benefit at all and 5 means that you receive a substantial benefit how would you rate the impacts of each of the following in your life?</p> <p>READ OUT ROTATING ORDER. GIVE EACH A SCORE FROM 1 TO 5</p> <p>Seeing trees or woods from where you live Knowing that there are trees and woodlands in Scotland Seeing trees and woodlands as you undertake your daily activities Knowing that Scottish woodlands will be there for future generations Knowing that Scottish woodlands provide a place for wildlife</p>
4	<p>How frequently did you visit woodlands last winter i.e. between October and March?</p> <p>READ OUT. SINGLE CODE</p> <p>Several times per week Several times per month About once a month Less often Never</p>
5	<p>How frequently are you visiting woodlands this summer i.e. between April and September?</p> <p>READ OUT. SINGLE CODE</p> <p>Several times per week Several times per month About once a month Less often Never</p>

6	<p>On average during the last 12 months how long did your visit last? READ OUT. SINGLE CODE</p> <p>Up to 15 minutes Over 15 minutes –30 minutes Over 30 minutes – 1 hour Over 1 hour – 2 hours Over 3 hours – 5 hours More than 5 hours</p>
7	<p>What activities do you tend to take part in when in woodland? DO NOT PROMPT. CODE ALL MENTIONED AND WRITE IN OTHERS</p> <p>Dog walking Other walking Cycling Mountain biking Picnicking Seeing something in the wood (e.g. sculptures, ancient trees, or historic sites) Attend cultural event or activity (e.g. exhibition, performance or ceremony) Jogging Horse riding Nature watching Photography Orienteering Taking children to play Conservation activity Other (SPECIFY)</p>
	<p>We would like to find out about people’s physical activity rates and the following questions explore this.</p> <p>By physical activity we mean any activities that make breathing and heartbeat faster such as sport, recreation, domestic activities like housework or gardening. Exercise can be built up of 10 minute bursts and does not have to be done all at once.</p>
8	<p>In an average week, on how many days do you undertake at least 30 minutes of moderate intensity physical exercise? SINGLE CODE</p> <p>0 days 1 day 2 days 3 days 4 days 5 days 6 days 7 days</p>
9	<p>In an average week, on how many days a week do you undertake at least 30 minutes of physical exercise <u>in woodlands</u>? SINGLE CODE</p>

	0 days 1 day 2 days 3 days 4 days 5 days 6 days 7 days
10	Do you have woodlands near to where you live i.e. within a 10 minute walk? Yes No IF YES GO TO 11 IF NO GO TO 12
11	Do you feel safe visiting the woods near to you? Yes No IF NO GO TO 12 IF YES GO TO 14
12	Would you be likely to become more physically active if there were woods near to where you lived that you felt safe visiting? Yes No IF YES GO TO 13 IF NO GO TO 14
13	In an average week, on how many days would you undertake a period of moderate exercise if there were woods near where you lived that you felt happy visiting? 0 days 1 day 2 days 3 days 4 days 5 days 6 days 7 day Don't know

14	<p>Have you done any of the following in woodlands in the last 12 months? READ OUT ROTATING ORDER. CODE ALL MENTIONED</p> <p>Been on a guided walk or talk Followed an interpreted trail</p> <p>Been on an organised event in a wood that involved physical activity</p>
15	<p>Have you done any of the following in the last 12 months? READ OUT ROTATING ORDER. CODE ALL MENTIONED</p> <p>Used the internet to find out about something about a woodland Used a leaflet to find out something about a woodland Discussed something about woodlands with family and friends</p>
16	<p>Have your or anyone in your family done any of the following in the last 12 months? READ OUT ROTATING ORDER. CODE ALL MENTIONED</p> <p>Been on a school trip to a wood Been to Forest School Been on a Forest Education Initiative event</p>
17	<p>In the last 12 months, have you gathered any of the following lichen, fungi, plant or tree materials from Scottish woodlands? READ OUT ROTATING ORDER. CODE ALL MENTIONED</p> <p>Items for eating or drinking such as berries, fungi, nuts, flowers and sap. Medicinal and dietary supplements such as St. Johns wort, meadowsweet and hawthorn. Decorative, floral and craft products such as foliage, branches, stems, moss, lichen and weld. Items for seasonal, cultural and religious use such as holly, ivy and hazel wands. Fuel products such as fire wood. Gathered other items in Scottish woodland (SPECIFY) No</p>
18	<p>In the last 12 months, have you gathered any animals or animal materials from woodlands? e.g. deer, pheasants, rabbits.</p> <p>Yes No</p> <p>IF ANSWER 'NO' TO Q17 AND Q18, SKIP TO Q24.</p>
19	<p>How often do you visit woodlands to gather plant or animal materials? READ OUT. SINGLE CODE</p> <p>Every day 4-6 times a week 1-3 times a week</p>

	<p>1-3 times a month 4-6 times a year 1-3 times a year Less often</p>
20	<p>How long, in hours and minutes, on average, do you spend gathering on each trip?</p> <p>Hours Minutes</p>
21	<p>For what purpose do you collect plant or animal materials?</p> <p>READ OUT ROTATING ORDER. CODE ALL MENTIONED</p> <p>As part of formal employment e.g. as part of work for a wholesaler, including full-full-time, part-time and seasonal employment. To sell as an individual (e.g. to a wholesaler, retail outlet or at country fairs) To barter For your personal use and enjoyment As a gift (e.g. to family member or friend)</p> <p>Other (SPECIFY)</p>
22	<p>On a scale from 1 to 5 where 1 is very unimportant and 5 is very important how would you rate the value of gathering these materials to the following?</p> <p>READ OUT ROTATING ORDER. GIVE EACH A SCORE FROM 1 TO 5</p> <p>Your livelihood or ability to make ends meet?</p> <p>Your ability to spend time with family, friends and other people?</p> <p>Your understanding of nature and the environment?</p> <p>Your ability to exercise?</p> <p>Your feelings of relaxation?</p> <p>Your recreational enjoyment?</p> <p>Your religious or spiritual well-being?</p>
23	<p>What do you estimate the approximate value (in £s) to be of all the raw materials you have gathered over the past 12 months if you had purchased them from a retailer rather than harvesting them yourself?</p> <p>SINGLE CODE.</p>

	<p>£0-50 £50-100 Over £100-500 Over £500-1000 Over £1000 (PLEASE SPECIFY APPROXIMATE VALUE)</p>
24	<p>During the past 12 months, which of the following activities, if any, have you taken part in? READ OUT ROTATING ORDER. CODE ALL MENTIONED</p> <ol style="list-style-type: none"> 1. Been involved in or consulted about plans for creating/managing or using woodlands in your area 2. Been involved in an organised a tree planting event 3. Been involved in voluntary work in connection with a woodland e.g. physical work in a wood, admin, fund raising, running a group 4. Become or are a member of a community based woodland group such as a 'Community Trust' or 'Friends of Group' 5. Been or are a member of an environmental organisation <p>IF NO TO ALL OF THE ABOVE GO TO 27. IF YES TO ONLY 5 GO TO 26</p>
25	<p>How many days in the last 12 months, have you spent on the activities you've just mentioned? If not are not sure give an estimate.</p> <p>Days (write in number)</p> <p>INTERVIEWER: ADD ALL HALF DAYS TO GIVE APPROXIMATE NUMBER OF DAYS</p>
26	<p>Would you associate any of the following with the activity(ies) just mentioned? READ OUT ROTATING ORDER. CODE ALL MENTIONED</p> <p>Friendship Trust Personal confidence Sense of belonging to your area/community Learning new skills Fun and enjoyment No, none of these</p>
27	<p>Using one of the following words, how much do you agree or disagree with the following statements?</p> <p>SHOW SCREEN WITH OPTIONS - STRONGLY AGREE, AGREE, NEITHER AGREE NOR DISAGREE, DISAGREE, STRONGLY DISAGREE.</p> <p>READ OUT STATEMENTS ROTATING ORDER.</p> <p>Woodlands are places to reduce stress and anxiety.</p>

	<p>Woodlands are places to exercise and keep fit.</p> <p>Woodlands allow families to learn about nature.</p> <p>Woodlands are good places to meet with friends and family.</p> <p>Woodlands in Scotland are an important part of the country's cultural heritage.</p> <p>Woodlands play an important role in children's and young people's outdoor learning experience.</p> <p>Woodlands in Scotland are important in helping people to earn a living or make ends meet.</p> <p>It is important to have a say in what happens in your local woodland.</p>
28	<p>Do you have any illness or disability that would limit your daily activities or the work you can do?</p> <p>Yes</p> <p>No</p>
29	<p>Are you...</p> <p>READ OUT</p> <p>Working full time (30+ hours per week)</p> <p>Working part time (less than 30 hours per week)</p> <p>Parent or carer (no paid employment outside home)</p> <p>Retired</p> <p>Unemployed</p> <p>Self employed</p> <p>In full time education</p> <p>Not working due to illness/disability</p> <p>Other (specify)</p>
30	<p>How would you describe your cultural or ethnic background?</p> <p>SHOW SCREEN</p> <p>White</p> <p>Mixed race</p> <p>Asian, Asian Scottish or Asian British</p> <p>Black, Black Scottish or British Black</p> <p>Other (SPECIFY)</p>
	<p>Do you agree to your contact details being passed on to the Forestry Commission to allow them to contact you again to take part in further research on the subject of woodlands? Your details would not be passed to any other organisation or used for any other purpose.</p> <p>Yes</p> <p>No</p>
	<p>Thank you for answering these questions, your answers will provide important information for the Forestry Commission and Forest Research.</p>

B) Questions for inclusion in the Scottish Opinion Survey, August 2007

Question number	Question
	<p>The next section is regarding Scottish woodlands. The results of this section will be used only by the Forestry Commission and Forest Research.</p> <p>By Scottish woodlands I mean forests and woodlands with small or large areas of trees, under any ownership, both old and new, and of any type.</p>
1	<p>Have you personally visited any Scottish woodlands in the last 12 months?</p> <p>SINGLE CODE</p> <p>Yes (CONTINUE) No (Go to Q6)</p>
2a	<p>How frequently did you visit Scottish woodlands last winter i.e. between October and March?</p> <p>i) Several times per week ii) Several times per month iii) About once a month – SKIP TO Q3a iv) Less often v) Never – SKIP TO Q3a</p>
2b	<p>ASK IF RESPONDENT ANSWERS i), ii) or iv) ABOVE</p> <p>You say you visited [INSERT FREQUENCY FROM Q2A] last winter. Typically, how many times did you visit in this period?</p> <p>IF i) - Several times per week visits in a typical week IF ii) - Several times per month visits in a typical month IF iv) – Less often visits per year</p>
3a	<p>And how frequently are you visiting Scottish woodlands this summer i.e. between April and September?</p> <p>i) Several times per week ii) Several times per month iii) About once a month – SKIP TO Q4a iv) Less often v) Never – SKIP TO Q4a</p>
3b	<p>ASK IF RESPONDENT ANSWERS i), ii) or iv) ABOVE</p> <p>You say you visited [INSERT FREQUENCY FROM Q2A] this summer. Typically, how many times did you visit in this period?</p> <p>IF i) - Several times per week visits in a typical week IF ii) - Several times per month visits in a typical month IF iv) – Less often visits per year</p>

4a)	When visiting Scottish woodland in the last 12 months did you ever take part in any of the following activities?						
4b)	FOR EACH ACTIVITY MENTIONED: Roughly how often did you take part in [INSERT NAMED ACTIVITY] on your visits to Scottish woodland over the last 12 months? Was it.....READ OUT FREQUENCY SCALE						
		Q4a	Q4b - Frequency				
		Taken part?	Every visit	Most visits	Around half of the visits	On occasional visits	Hardly ever
	Dog Walking						
	Other walking						
	Cycling						
	Mountain biking						
	Picnicking						
	Seeing something in the wood (e.g. sculptures, ancient trees, or historic sites)						
	Attend cultural event or activity (e.g. exhibition, performance or ceremony)						
	Jogging						
	Horse riding						
	Nature watching						
	Photography						
	Orienteering						
	Taking children to play						
	Conservation activity						
	Other (SPECIFY)						
5	<p>On average what percentage of your Scottish woodland visits in the last 12 months were to local woodland (i.e. within 500 metres or approximately a 7 to 8 minute walk)</p> <p>None 1-20% 21-40% 41-60% 61-80% 81-100% Do not have woodlands within 500 metres.</p>						
6a (ASK ALL)	<p>Do you have any children aged under 16 years of age living in your household?</p> <p>Yes No – GO TO Q9</p>						
6b	<p>IF YES: How many in total, what are their ages and sex?</p>						
			Males		Females		
		0-5 yrs					
		6-9 yrs					
		10-15 yrs					

7a	<p>REPEAT FOR EACH CHILD MENTIONED AT Q6b</p> <p>Thinking of the youngest child in the household, how frequently, if at all, did he/she visit Scottish woodland in the last 12 months? Please include all trips – either accompanied by parents, other adults, friends or unaccompanied.</p> <p>Several times per week Several times per month About once a month Less often Never</p>
7b	<p>Again, thinking about the youngest child, did they make any visits to Scottish woodlands as part of a nursery, school trip in the past 12 months</p> <p>Yes No – REPEAT Q8a FOR NEXT YOUNGEST CHILD – WHEN ALL CHILDREN IN HOUSEHOLD COVERED, GO TO Q8</p>
7c	<p>IF YES: Roughly how many such visits did they make to Scottish woodlands in the last 12 months?</p> <p>Total number of visits: _____</p>
<p>REPEAT Q7a-c FOR ALL OTHER CHILDREN UNDER 16 IN HOUSEHOLD</p>	
8	<p>Thinking about your own visits to Scottish woodlands in the last 12 months, approximately on what percentage of your visits were you accompanied by some or all of the children in your household (aged under 16 years)</p> <p>None 1-20% 21-40% 41-60% 61-80% 81-100% Don't know</p>
9	<p>ASK ALL How important was locally available greenspace (woods, parks, countryside) to your decision to live at your current address</p> <p>Very Important Quite important Neither important nor unimportant Not at all important I had no choice about where I lived / I didn't make the decision Don't know</p>

APPENDIX 5: CALCULATIONS USED TO ESTIMATE VISIT NUMBERS

The estimates for annual number of visits to woodlands by members of the Scottish adult population given in Table 25 are based on the calculations given below. The following conservative assumptions were used for the frequency classes:

- Several times a week = 2 times a week
- Several times a month = 2 times a month
- Once a month = 1 time a month
- Less than once a month = 1 time in six months

Table A2. Visit numbers derived from Forestry for People Omnibus Surveys 2007 and 2006

	Frequency class						Scottish adult population	Number of visits, and base
	Several times a week	Several times a month	Once a month	Less than once a month	Never	Total		
F4P OMNIBUS SURVEY AUGUST 2007								
Winter 2006/07	46	65	80	144	663	998	4,195,000	998
%	5%	7%	8%	14%	66%	100%		
number of visitors	193,357	273,221	336,273	605,291	2,786,859	4,195,000		
Freq	52	12	6	1	0			
visits	10,054,549	3,278,657	2,017,635	605,291	0	15,956,132		
Summer 2007	60	100	102	122	614	998	4,195,000	998
%	6%	10%	10%	12%	62%	100%		
number of visitors	252,204	420,341	428,747	512,816	2,580,892	4,195,000		
Freq	52	12	6	1	0			
visits	13,114,629	5,044,088	2,572,485	512,816	0	21,244,018		37,200,150
F4P OMNIBUS SURVEY AUGUST 2006								
Winter 2005/06	82	136	131	160	506	1015	4,180,000	1015
%	8.1%	13.4%	12.9%	15.8%	49.9%	100%		
number of visitors	337,695	560,079	539,488	658,916	2,083,823	4,180,000		
Freq	52	12	6	1	0			
visits	17,560,118	6,720,946	3,236,926	658,916	0	28,176,906		
Summer 2006	121	201	142	89	462	1015	4,195,000	1015
%	12%	20%	14%	9%	46%	100%		
number of visitors	500,094	830,734	586,887	367,837	1,909,448	4,195,000		
Freq	52	12	6	1	0			
visits	26,004,867	9,968,808	3,521,320	367,837	0	39,862,833		68,039,739

Table A3. Visit numbers derived from the Scottish Public Opinion of Forestry Surveys 2007, 2005 and 2003

	Frequency class						Scottish adult population	Number of visits, and base
	Several times a week	Several times a month	Once a month	Less than once a month	Never	Total		
SCOTTISH POF SURVEY FEBRUARY 2007								
Summer 2006	0.13	0.27	0.31	0.24	0.04		4,195,000	0.75
%	10%	20%	23%	18%	29%	100%		
number of visitors	409,013	849,488	975,338	755,100	1,206,063	4,195,000		
Freq	52	12	6	1	0			
visits	21,268,650	10,193,850	5,852,025	755,100	0	38,069,625		
Winter 2006/07	0.08	0.12	0.19	0.38	0.23		4,195,000	0.75
%	6%	9%	14%	29%	42%	100%		
number of visitors	251,700	377,550	597,788	1,195,575	1,772,388	4,195,000		
Freq	52	12	6	1	0			
visits	13,088,400	4,530,600	3,586,725	1,195,575	0	22,401,300		60,470,925
SCOTTISH POF SURVEY FEBRUARY 2005								
Summer 2004	0.09	0.27	0.28	0.25	0.08		4,143,000	0.5
%	5%	14%	14%	13%	56%	100%		
number of visitors	186,435	559,305	580,020	517,875	2,299,365	4,143,000		
freq	52	12	6	1	0			
visits	9,694,620	6,711,660	3,480,120	517,875	0	20,404,275		
Winter 2004/05	0.07	0.11	0.17	0.34	0.32		4,154,000	0.5
%	4%	6%	9%	17%	66%	100%		
number of visitors	145,390	228,470	353,090	706,180	2,720,870	4,154,000		
freq	52	12	6	1	0			
visits	7,560,280	2,741,640	2,118,540	706,180	0	13,126,640		33,530,915
SCOTTISH POF SURVEY FEBRUARY 2003								
Summer 2002	0.14	0.26	0.24	0.31	0.05		4,112,000	0.64
%	9%	17%	15%	20%	39%	100%		
number of visitors	368,435	684,237	631,603	815,821	1,611,904	4,112,000		
freq	52	12	6	1	0			
visits	19,158,630	8,210,842	3,789,619	815,821	0	31,974,912		
Winter 2002/03	0.04	0.08	0.13	0.32	0.4		4,113,000	0.64
%	3%	5%	8%	20%	64%	100%		
number of visitors	105,293	210,586	342,202	842,342	2,612,578	4,113,000		
freq	52	12	6	1	0			
visits	5,475,226	2,527,027	2,053,210	842,342	0	10,897,805		42,872,717

Table A4. Visit numbers derived from the UK or GB Public Opinion of Forestry Surveys (Scottish Respondents) 2007, 2005 and 2003

	Frequency class						Scottish adult population	Number of visits, and base
	Several times a week	Several times a month	Once a month	Less than once a month	Never	Total		
UK POF SURVEY: SCOTTISH RESPONDENTS FEBRUARY 2007								
Summer 2006	70	77	56	57	93	353	4,195,000	353
%	20% 22	%	16%	16%	26%	100%		
number of visitors	831,870	915,057	665,496	677,380	1,105,198	4,195,000		
freq	52	12	6	1	0			
visits	43,257,224	10,980,680	3,992,975	677,380	0	58,908,258		
Winter 2006/07	35	35	36	80	167	353	4,195,000	353
%	10% 10	%	10%	23%	47%	100%		
number of visitors	415,935	415,935	427,819	950,708	1,984,603	4,195,000		
freq	52	12	6	1	0			
visits	21,628,612	4,991,218	2,566,912	950,708	0	30,137,450		89,045,708
GB POF SURVEY: SCOTTISH RESPONDENTS FEBRUARY 2005								
Summer 2004	35	66	62	78	134	375	4,143,000	375
%	9% 18	%	17%	21%	36%	100%		
number of visitors	386,680	729,168	684,976	861,744	1,480,432	4,143,000		
freq	52	12	6	1	0			
visits	20,107,360	8,750,016	4,109,856	861,744	0	33,828,976		
Winter 2004/05	17	27	42	85	204	375	4,154,000	375
%	5% 7	%	11%	23%	54%	100%		
number of visitors	188,315	299,088	465,248	941,573	2,259,776	4,154,000		
freq	52	12	6	1	0			
visits	9,792,363	3,589,056	2,791,488	941,573	0	17,114,480		50,943,456
UK POF SURVEY: SCOTTISH RESPONDENTS FEBRUARY 2003								
Summer 2002	24	72	74	66	178	414	4,112,000	414
%	6% 17	%	18%	16%	43%	100%		
number of visitors	238,377	715,130	734,995	655,536	1,767,961	4,112,000		
freq	52	12	6	1	0			
visits	12,395,594	8,581,565	4,409,971	655,536	0	26,042,667		
Winter 2002/03	11	21	34	85	263	414	4,113,000	414
%	3% 5%	%	8%	21%	64%	100%		
number of visitors	109,283	208,630	337,783	844,457	2,612,848	4,113,000		
freq	52	12	6	1	0			
visits	5,682,696	2,503,565	2,026,696	844,457	0	11,057,413		37,100,080

APPENDIX 6: SCREENSHOTS FROM THE VIEWSHED ANALYSIS

The following provides a series of screenshots of part of the GIS analysis used to estimate the numbers of people in Glasgow and Fort William who can view woodland from where they live (Figures A1 to A6).

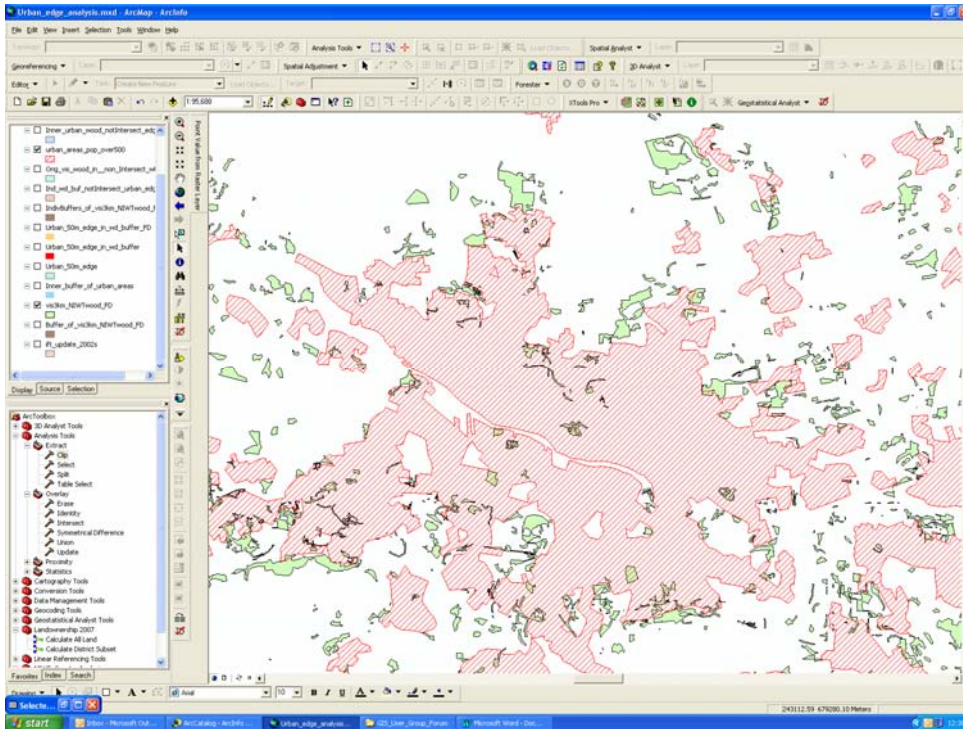


Figure A1. Basic data from the viewshed analysis: visible woodland in Glasgow: green – woodland; red hatched – urban

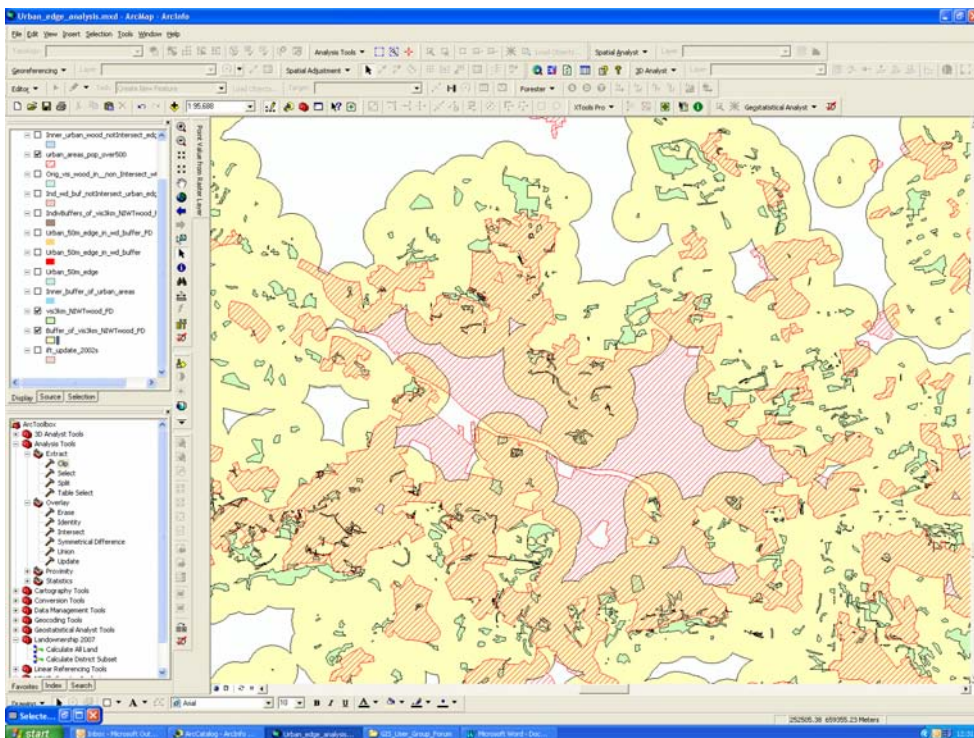


Figure A2. Step 1 (Glasgow): a buffer of 1 km applied to woodlands (yellow area)

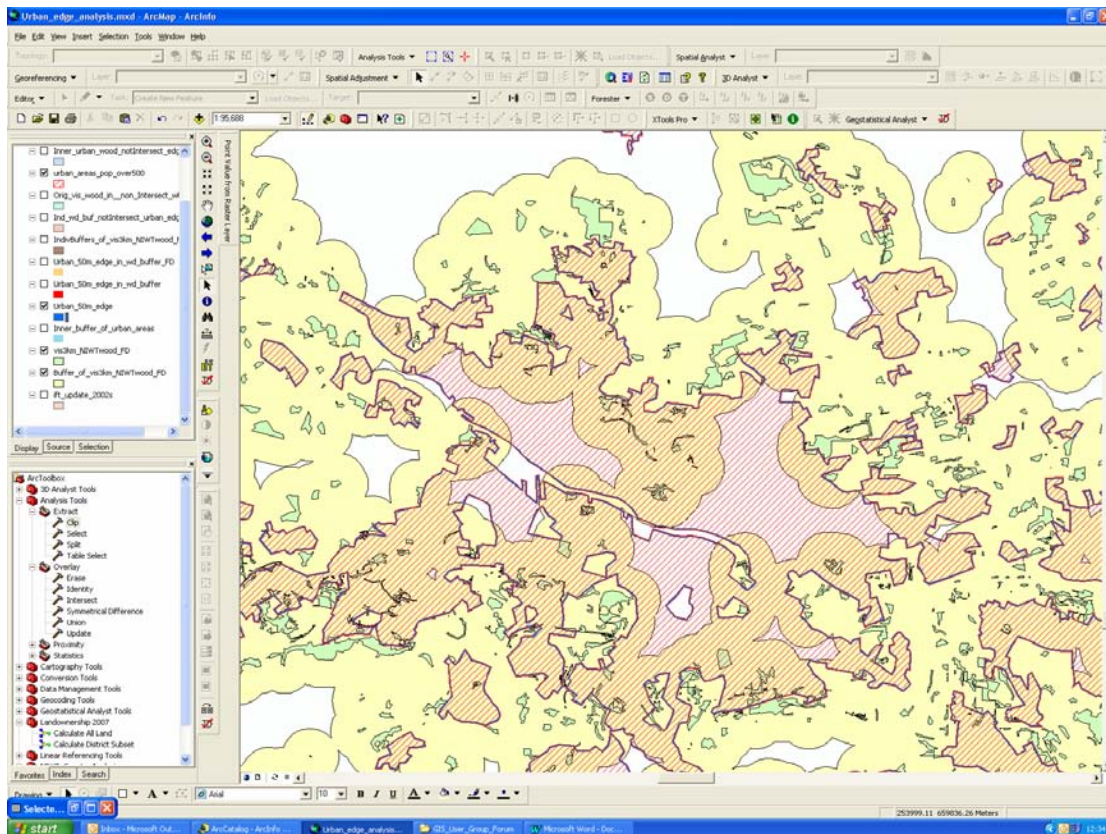


Figure A3. Step 2 (Glasgow): an inner buffer of 50m applied to urban areas (blue outer edge)

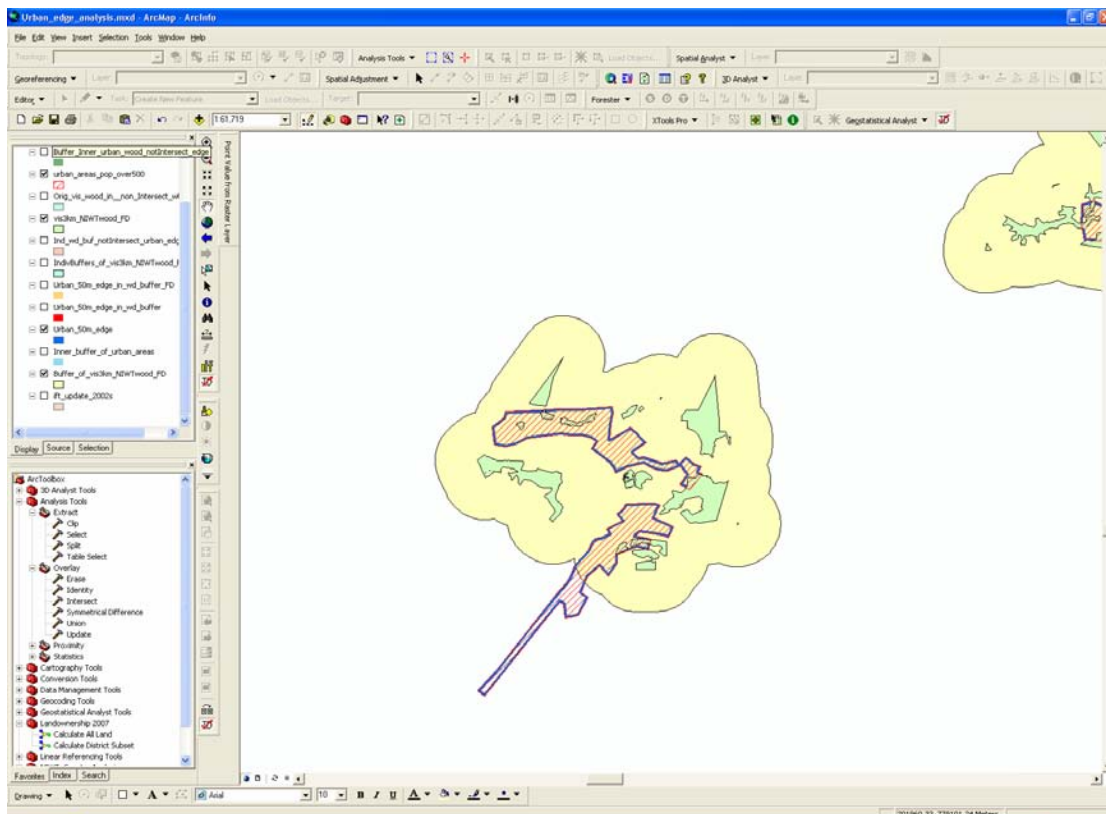


Figure A4. Step 2 (Fort William): an inner buffer of 50m applied to urban areas (blue outer edge)

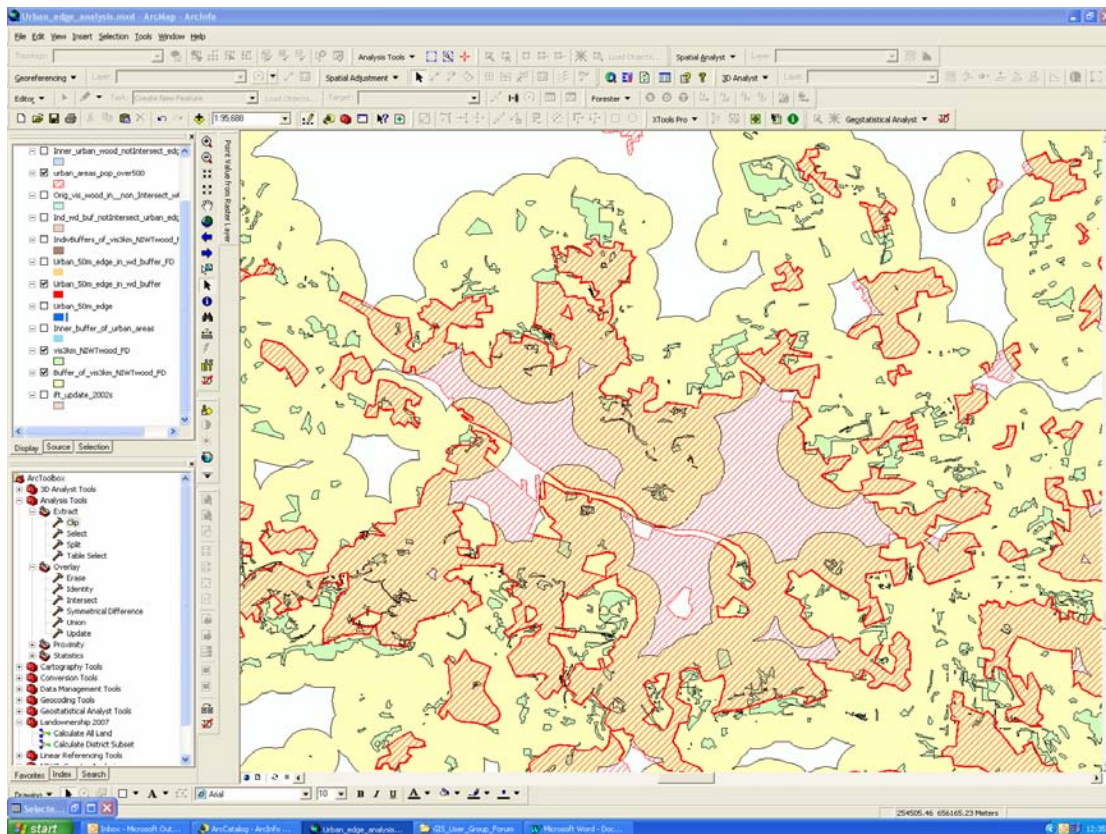


Figure A5. Step 3 (Glasgow): the intersection of the two was found (bright red area) and the proportional population estimated

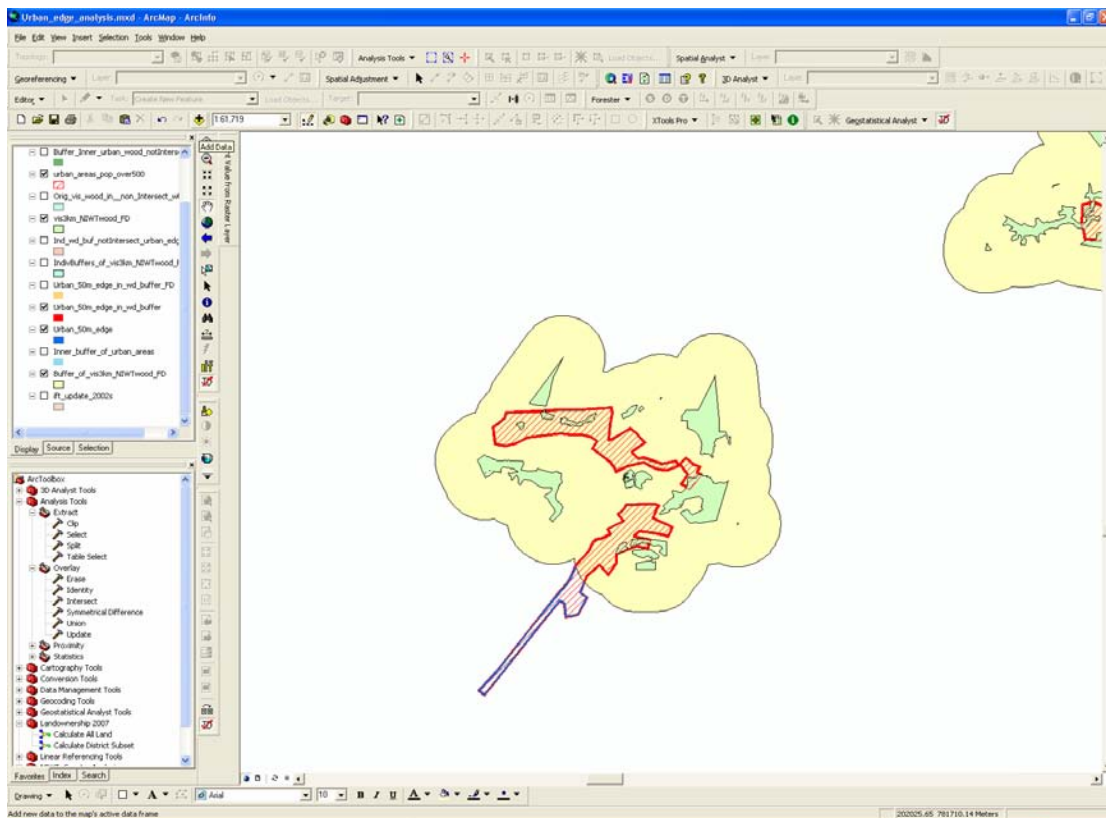


Figure A6. Step 3 (Fort William): the intersection of the two was found (bright red area) and the proportional population estimated

This report presents the results of a comprehensive valuation of the current social and economic benefits of forestry, forests and woodlands in Scotland that are derived by the people of Scotland. The research was based upon a typology of seven 'Forestry for People' themes which were: employment and volunteering, contribution to the economy, recreation and accessibility, learning and education, health and well-being, culture and landscape, and community capacity. An indicator framework was developed as a basis for defining the scope of the project, reporting of headline findings, and to aid project management. Thirty quantitative indicators covering the seven themes are given in the report. The use of quantitative indicators was supplemented by qualitative research from two contrasting case study regions: the Loch Ness area in the Scottish Highlands, and the Glasgow and Clyde Valley region.



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