

Review of the research evidence in relation to the role of trees and woods in formal education and learning

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2010



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Executive summary

The aim of this review was to explore research relating to education and learning outdoors and particularly that which takes place in, or focuses on, tree, woods and forests. A desk based review was undertaken supplemented by a small number of interviews.

Tree, wood and forest (TWF) education and learning (E&L) is any activity which takes place in, or focuses on, the specific environment or context of TWF and which provides opportunities for the participant to engage with or learn about those environments. Many outdoor and TWF focused activities which are not explicitly designed to have E&L objectives may have relevant learning outcomes. For instance programmes or activities which aim to increase levels of activity in woodland settings may result in greater engagement with and knowledge of TWF.

The Forestry Commission in England, Scotland and Wales, is one of number of organisations which delivers a wide range of E&L opportunities and activities in woods and forests for all ages. The Forestry Commission in each country delivers E&L through the following mechanisms:

- Direct formal provision of E&L: curriculum and non curriculum based, forest apprenticeships and work placements
- Facilitation: partnerships such as the Forest Education Initiative, grants and funding such as the Forest School Woodland Improvement Grant, teacher/educator support and training
- Resource provision: physical resources and educational materials
- Interpretation: led visits and self use interpretation
- Play: provision of play activities and opportunities
- Campaigns and events: through national media or schools
- Projects/programmes where E&L is often an outcome but not a specific focus of the project e.g. health projects, volunteering, 'friends of' groups.

The focus of the research identified for this review has primarily been on more formal provision of outdoor E&L and on children and young people. Less is known about E&L associated specifically with trees and woods; what there is has predominantly focused on Forest School. Much of the research has explored personal, social and emotional development rather than specific educational outcomes.

Evidence from this review suggests that outdoor learning may result in:

- improved personal and interpersonal skills including communication and teamwork
- the accumulation of social capital, in particular fostering pride, belonging and involvement in the community
- more positive attitudes regarding the natural environment
- the acquisition of academic skills and knowledge.

Results from research on E&L in woodlands, for instance programmes such as Forest School, suggest that it can have a range of positive impacts on participants: including increases in confidence and self esteem, improving social skills, communication and language, motivation and concentration and improving physical skills. Outdoor learning can also provide greater opportunities for physical activity and be of benefit in terms of broad health and wellbeing.

The results of this review highlight the broad range of research gaps regarding E&L outdoors and in particular that which takes place in or focuses on TWF. For instance, little work has been undertaken to explore the impacts of specific E&L activities in woods on adults, the long term outcomes of such activities or on the role of the specific environment on the observed outcomes. It is possible that the body of evidence is limited because of the following factors: 1), the sheer diversity of TWF E&L activities, approaches and participants; 2), the issues surrounding the identification of TWF activities as having E&L aims or outcomes; and 3), the costs, in terms of time and resources, of educational research. Much research on Forest School has been undertaken because not only are a wide range of people and organisations interested in the approach, the programme is clearly identifiable as having E&L objectives. Therefore it has been understandable to focus on Forest School in the effort to understand the role of TWF in E&L.

Potential opportunities for future research could include a focus on the:

- Impacts of different types of TWF education provision
- Impacts of TWF education on educational outcomes and attainment
- The specific added or different benefits of the woodland environment for education
- Long term impacts of education in woods and forest on different groups
- Wider impacts of education in woods e.g. in terms of impacts on health, knowledge of climate change, employment, and community impacts
- Impacts of various forms of education in woodlands on different populations, particularly adults.

Specific design issues will need to be addressed such as the reliance on cross sectional designs (an approach which researches the topic of interest at a particular point in time). It is also suggested that particular aspects of research design should be considered, these include the use of longitudinal research which is particularly important in researching the outcomes of E&L, and control groups which potentially could be used to identify the particular impacts of TWF as opposed to learning in other outdoor spaces. On going monitoring and evaluation of existing provision in woodlands is also important if the range of what is being undertaken is to be made known.

1. Introduction

This document reviews research which has explored the more formal outdoor education and learning (E&L) that takes place with a specific focus on, or which takes place in the context of trees, woods and forests (TWF) in Britain. The E&L activities that take place outdoors are very broad ranging and it is beyond the scope of this review to cover all the elements of outdoor and TWF E&L such as play and self-directed or informal learning associated with interpretation or education trails. Instead this review focuses on the more formal aspects of E&L outdoors, particularly that which takes place in the context of TWF.

The paper starts with definitions and examples of E&L associated with TWF. A short background is given, followed by the methods and results of the review. Research gaps are highlighted. The appendices provide some of the policy and practice context within which E&L in the outdoors, and more particularly in TWFs, takes place in Britain.

1.1 Definitions of key terms

Education

'Education' has been described as an *"act or experience that has a formative effect on the mind, character, or physical ability of an individual... education is the process by which society, through schools, colleges, universities, and other institutions, deliberately transmits its cultural heritage, its accumulated knowledge, values, and skills, from one generation to another"* (Kneller 1971). The intention of education is development and growth and is future orientated: it involves activities that are intended to stimulate thinking and to foster learning. The term 'education' is generally used to describe the relatively formal communication of information that will increase knowledge, skills and understanding.

Forestry Commission England's (FCE) education strategy (2009) defines education as an *input, being activities where the primary aim is the delivery of information to increase understanding, knowledge or skills, or change behaviour through direct contact, materials or interpretation.*

Learning

'Learning' is the cognitive process of the acquisition of knowledge, values, and/or skills (Edwards, et al. 2008b). Learning is the hoped for outcome of education, as well as of other less formal, less institutionalised experiences, including play, exploration or investigation, and encompasses the physical, cognitive, emotional and social development of children in their earliest years of their lives to adults in their last years.

FCE (2009) defines learning as an *outcome, being an increase in skills and knowledge, or change in behaviour or attitude as a result of education but more commonly through self led or facilitated activities and might include interpretation.*

Outdoor learning and education

The terms 'outdoor education' and 'outdoor learning' are broad, complex and have many definitions (Rickinson, et al. 2004). A recent review of outdoor education defined it as any E&L which takes place in the 'outdoors' (i.e. in a location that is not indoors); these outdoor locations range from the school playground to the top of a mountain (Table 1). Beyond this distinction outdoor education or learning encompass a myriad of philosophies (though in particular the concept of experiential learning¹), approaches and practices including, as Rickinson et al. (2004) noted, fieldwork and outdoor visits, outdoor adventure education, and school grounds and community based projects.

Table 1: Examples of common outdoor learning approaches

Outdoor learning approaches	Examples include:
School grounds/gardens/community projects	Eco schools; school gardens and farms; community green spaces
Outdoor day or residential visits	School visits/trips to a forest classroom or green space
Regular outdoor learning	Forest School; nature kindergartens; practical environmental volunteering; and more targeted projects for people with certain disabilities or social problems
Guided walks/events	Fungi foray's; nature walks; bird watching.
Environmental and geographical education	Trips to field study centres; residential courses
Outdoor play – particularly for young children	Nature kindergartens; nature in school grounds; Forest School
Modern apprenticeships	Training and skills development in nature through specific programs
Adventure and recreation activities	Outward Bound ² and residential courses
Outdoor therapeutic learning projects	Wilderness therapy interventions

Tree, wood and forest education and learning

TWF E&L is any activity which takes place in or focuses on, the specific environment or context of TWF and which provides the opportunity for the participant to engage with or learn about those environments. TWF focused E&L should not be considered to be solely a form of outdoor education or learning. Whilst it is true that much of TWF E&L does take place outdoors, many examples can be identified which take place indoors. Also many TWF focused activities which are not explicitly designed to have E&L objectives may have relevant learning outcomes. For instance programmes or activities which aim to increase levels of activity in woodland settings may result in greater engagement with and knowledge of TWF.

TWFs can provide an important resource for E&L and the use of such environments has the potential to result in a range of positive outcomes. In addition to the educational,

¹ Described as the process of learning through 'doing' – knowledge is argued to be gained through experience

² British educational charity that uses outdoor experiences and challenges to help and develop young people.

psycho-social, behavioural and emotional outcomes associated with outdoor E&L (see section 4), TWF E&L has the potential to promote a greater understanding of the economic, social, cultural and biodiversity value of woodlands and forests. TWF E&L may also contribute to public understandings of the wider countryside as a living, working environment, and of many current environmental issues such as climate change.

TWF E&L takes many forms, but common examples include:

- Formal curriculum linked E&L in woods or forests
- Formal curriculum linked E&L focused on TWF
- Skills training in woods and forests
- Informal or play based TWF E&L
- Interpretative TWF E&L (including self led and 'expert' led activities)
- TWF community events

1.2 Understanding the variety of education and learning in, or focused on, trees, woods and forests

As the previous section indicates there is a huge variety of TWF E&L. It is, therefore, useful to create a broad typology in terms of form, use, audience and delivery.

Formality

The formality of TWF E&L can be viewed as a continuum: at one end there are very formal outcome focused activities and at the other very informal, often individual self-directed activities which result in TWF E&L can be found. However TWF E&L can typically be categorised into one of three 'levels' of formality:

- **Formal:** activities which have a specific and desired for outcome, often associated with formal curricula, which take place in or focuses on TWF. Examples would include use of forest research plots by university students or forestry students undertaking chainsaw training and some Forest Schools.
- **Non-formal:** activities which tend to have an agreed learning purpose which takes place in or focuses on the particular context of TWF. Examples would include individuals participating in expert led interpretative events such as a nature walk or fungi foray.
- **Informal:** activities which do not have an explicit focus on E&L but which may result in greater engagement with or knowledge of TWF. Examples would include use of interpretation boards in woodlands or den building days for children.

Use

TWFs are typically *used* in one of two broad ways in relation to E&L:

- As a **setting**; where formal, non-formal or informal E&L takes place in the specific context of TWF, the E&L may or may not be focused on TWF.

- As a **focus** or **resource** for E&L; where formal, non-formal or informal E&L is focused on or uses TWF as a theme or basis for E&L, the E&L may or may not take place in TWF.

Audience

E&L in, or focusing on, the outdoors is not aimed solely at children in the school system. There is an emphasis, particularly amongst organisations with a public remit (including the FC), on inclusivity; ensuring that everyone, regardless of age, gender, cultural or ethnic background, socio-economic status, physical and mental ability or sexual orientation, has the opportunity to participate and benefit.

Delivery

A number of organisations are actively engaged in delivering or facilitating TWF E&L (see Appendix 4 for a number of examples). Again the delivery mechanisms are broad and range from direct delivery by trained educators to more passive approaches such as placing interpretation boards around a woodland site. Table 2 outlines the range of TWF E&L delivery mechanisms used by the FC England, Scotland and Wales.

Table 2: Forestry Commission TWF E&L delivery

E&L	Approach	Delivery mechanism	Examples
Direct E&L provision by FC staff	Curriculum based	Forestry Commission staff	School / university trips to woods and forests; use of forest plots; some Forest Schools
	Non-curriculum activities	Forestry Commission staff	Ranger led interpretation, e.g. fungi foray; some Forest Schools
	Skills training	Forestry Commission staff	Forest Apprenticeships; work placements; vocational training e.g. through '14-19 pathways'; Forestry Commission staff development; Forest School training
Facilitation of E&L opportunities	Partnerships	Forestry Commission staff and other educators and non-educational specialists	Forest Education Initiative; Forest Apprenticeships
	Grant schemes, funding and support	Forestry Commission, Forest Education Initiative	Woodlands In and Around Towns; Woodland Improvement Grants; Forest School Challenge Funds; FEI cluster group funded projects
	Teacher / educator support and training	Forestry Commission staff and other experts	Ranger visits to school; advice and support for teachers wishing to use woods and forests
Resource provision	Educational materials	Forestry Commission staff, educators, users	Tree Trunk online resources

	Physical resources	Forestry Commission staff, educators, users	Use of forest research plots; use of woods and forests by forestry skills training companies; educator-led formal and informal educational activities
	Online, printed, auditory or film media	Forestry Commission staff, educators, users	FC Wales factsheets e.g. Forest Machines and equipment
Interpretation	Led visits	Forestry Commission staff, other 'experts'	Fungi-forays; get to know local woodland events,
	Static or portable self-use interpretation media	Users	Leaflets; posters; guide books; audio-guides; interpretation boards in forests; interpreted nature or activity trails
Play	Provision of play opportunities	Forestry Commission staff, users, educators	Den building day; It's okay to play project; Forest School for pre-school children.
Campaigns and events	National media	Any	Website information on events and activities in specific woodlands
	Schools	Any	'Seeds for Schools',
Non – specific E&L programmes and projects	Health	Any	Chopwell Wood Health Project
	Recreation	Any	Babes in the woods,
	Volunteering	Any	Volunteer rangers New Forest
	Community outreach	Any	Consultation processes,
	Groups such as 'Friends of...'	Any	Friends of Chopwell Wood

Whilst each country provides a similar range of TWF E&L opportunities there are differences in the delivery mechanisms and structure between each country. FC Wales has a dedicated Woodlands for Learning Team, in England education is delivered by individual districts and development depends on local needs and a local education strategy. FC Scotland has a mixture of education staff and multi-role rangers who focus on community, recreation and education (FC Anon, 2010).

2. Background

2.1 Education and learning in, or focusing on, the outdoors and trees, woods and forests

There is currently considerable interest in the use of the outdoors and of the more specific environments of TWFs as a context or focus for E&L. The interest is broad; evident in governmental policies, of which the Welsh Assembly Government's Foundation Curriculum, with its *greater emphasis on using the outdoor environment as a resource for children's learning* (DCELLS 2008) is one example, to individual actions such as schools taking up grants to improve their outdoor spaces or devoting teaching time to

programmes such as Forest School. Use of the outdoors, and more specifically the particular context of TWF, for E&L, is also supported by the general public. The most recent Public Opinion of Forestry survey (Economics and Statistics 2009) found that there was good support for using TWF as a context for E&L and that there was a perception that these particular environments are especially relevant to environmental and cultural learning.

The current high levels of interest are likely to be being driven by a number of factors, not least the current concern that people, and children especially, are increasingly isolated from the natural environment (Louv 2005). Greater public awareness of, and possible concern for, a number of environmental issues (including climate change and resource use) may also be influencing the greater interest in focusing on, or taking E&L, outdoors. A further factor may be a somewhat reduced concern with the risks associated with formal E&L in the outdoors; perhaps the greater awareness of the less 'extreme' forms of outdoor learning (e.g. school grounds projects and other community based approaches) is helping turn attention towards the range of positive impacts and away from rare but negative outcomes (see the 'Education Outside the Classroom' report (House of Commons Education and Skills Committee 2005 pp EV137-146) for evidence regarding accidents). More broadly there is a focus on how the use of the outdoors for E&L can contribute not only to the acquisition of knowledge and skills but may also have wider impacts on health and wellbeing and the quality and level of community cohesiveness (O'Brien, et al. 2009).

2.2 Policy and practice context of education and learning in, or focused on, trees, woods and forests

Appendix 2 outlines the E&L policy context within which the FC in England, Scotland and Wales is operating. Appendix 3 highlights the key parts of the three country forestry strategies that discuss E&L, with Table 6 outlining the key E&L objectives, and outcomes or indicators of success. Common themes across the country strategies are identified. Appendix 4 shows that the FC in England, Scotland and Wales is one of a number of providers of E&L. Appendix 5 provides some examples of TWF E&L initiatives and Appendix 6 outlines a range of past and current projects and programmes run by FC in England, Scotland and Wales that have links to E&L. The examples given in appendices 4-6 provide a taster of the range of organisations involved and projects being undertaken, they are not meant to be a comprehensive review of all that is taking place.

3. Methodology

The aim of this review was to provide an overview of research in relation to outdoor and TWF E&L in Britain. Two main research strategies were used: firstly, a desk based review of evidence, practice and policy in relation to outdoor and TWF E&L and, secondly, a small number of interviews were carried out with stakeholders.

Desk based review

The first phase of the desk based review concentrated on identifying relevant research and evaluative literature, both academic and 'grey', relating to outdoor and TWF E&L from the previous 15 years. The aim of this phase of the review was to understand what is and is not known about the delivery, processes, outcomes and impacts of outdoor and TWF E&L. A number of academic databases were searched (these included IBSS, ERIC and the British Education Index, the Physical Education Index and indexes of theses (British and International)) using the terms detailed in Table 3. Web searches using primary and academic search engines were also conducted and reference lists were manually searched for further literature.

Table 3: Search terms: semi-systematic review

Categories	Search terms
The context	Trees, woods, forests, environment, outdoors
The process	Education, learning, life-long learning, interpretation, apprenticeships, career-ships, school trip/visit, skills, degree
The evidence	Evaluation, research, review, evidence, outcome, impact

Finally key individuals were contacted to request suggestions of relevant literature. All the literature identified and considered to be relevant were placed in a reference management program. Details of the literature can be found in Appendix 7.

The second phase of the desk based review was to: firstly, provide an overview of the policy and strategy context (governmental and organisational) for outdoor and TWF E&L in the UK; secondly, to identify the range of organisations delivering or facilitating TWF E&L (predominantly in the UK, though some international examples were included); and, thirdly, to identify as many examples of TWF E&L projects and programmes (in the UK) as was possible within the time frame of the review. Strategies used during this stage included web searches, review of policy documents (governmental and organisational) and contacting relevant individuals and organisations.

Interviews

Fourteen interviews³ were conducted with a range of stakeholders during both this review and a complementary study (an appraisal of the wellbeing benefits, projects and programmes (including E&L) of TWF). The primary aim of this strategy was to obtain a greater understanding of the FC's position in relation to TWF E&L; topics included the range of E&L projects and programmes, the importance of the provision and delivery of such opportunities, and the relevance of using TWF.

³ Thanks are due to the interviewers: Amy Stewart, Bianca Ambrose-Oji, Julie Urquhart, Jake Morris, Matt Jollands and Claudia Carter.

4. Review of the research evidence

This section details the results of the review relating to the processes, impacts and outcomes of E&L in the outdoors, and more particularly in relation to TWF. The review highlighted the relatively small body of research evidence. This finding was supported by the written evidence of Dr Pete Higgins in his submission to the House of Commons report on Education Outside the Classroom (2005 pp EV112) *In the 30-40 years of higher education involvement there have been less than a dozen PhD theses written on the subject area and no major grants awarded.*

Research to date has tended to focus on children and young people, the more formal types of E&L and use of cross-sectional designs. Very little research has investigated E&L in the particular context of TWF.

Academic journals and conference papers:

- Over 40 international journal papers and seven conference papers were identified which had direct relevance to this review.
- The majority of the papers discuss formal E&L, aimed at children, which takes place in the outdoors.
- The papers which discuss E&L in relation to TWF are predominantly focused on Forest School.

These and dissertations:

- Eleven theses and dissertations were identified, the majority of which originated in the USA.
- Two-thirds of the theses and dissertations discussed outdoor E&L for children.

Reports and organisational evaluations ('grey literature'):

- Again just over 40 reports and evaluations of relevance were identified.
- There was a greater focus on the use of TWF for E&L in comparison to the academic literature; this perhaps reflects the priorities of the organisations funding the evaluations and reports. Though again a significant proportion focused on Forest Schools.
- Similarly to the academic literature, the majority of the reports and evaluations focused on E&L provision for children and young people.

4.1 Benefits of education and learning in the outdoors

In general the research identified during this review indicates that E&L in the outdoors, and in particular that which takes place in more green environments, is highly beneficial (Dillon, et al. 2005; Hattie, et al. 1997; Nicol, et al. 2007; OFSTED 2004; Peacock 2006; Rickinson, et al. 2004). For instance the OFSTED report (2004 p2) which focused on the potential benefits of outdoor education concluded that *outdoor education gives depth to the curriculum and makes an important contribution to student's physical, personal and social education.*

One of the largest and most comprehensive reviews of the research on outdoor learning was carried out by Rickinson et al. (2004) for the National Foundation for Education Research (NFER). This critical review summarised the findings of 150 pieces of (international) research published between 1993 and 2003. The authors focused on three main types of outdoor learning; 1) fieldwork and outdoor visits; 2) outdoor adventure education; and 3) school grounds/community projects. Their primary conclusions, relating to each of the three types of outdoor learning, are summarised below:

- 1. Impacts of fieldwork and visits:** Rickinson et al. (2004) concluded that there is substantial evidence which indicates that these types of outdoor learning, when *properly conceived, adequately planned, well taught and effectively followed up* can increase knowledge, have a positive impact on long term memory, improve social skills and result in higher order learning⁴.
- 2. Impacts of outdoor adventure activities:** the authors found that there is strong research evidence that outdoor adventure activities are beneficial (in both the short and long term), though they note that these impacts vary between the different kinds of programmes. The most convincing evidence suggests that outdoor adventure programmes have positive impacts on participant's attitudes, beliefs and self-perceptions and on their interpersonal and social skills. There is an indication (the evidence base is somewhat weaker) that this form of outdoor learning can also have positive impacts on academic skills and behaviour, physical self-image and fitness.
- 3. Impacts of school grounds/community projects:** Rickinson et al. (pp 6) concluded that outdoor learning taking place in the participant's school grounds or community may result in *greater confidence, renewed pride in community, stronger motivation towards learning and a greater sense of belonging and responsibility*. Furthermore this particular approach may have wider positive impacts for social development and community involvement. It was noted that this form of learning in the outdoors has the greatest capacity to link to specific curriculum priorities.

A second report for the NFER (Dillon, et al. 2005 pp 1) aimed to better understand how the outdoors is used as a classroom for educational activities. The authors focused on the processes, impacts and the planning and evaluation of a number of case studies in three outdoor learning contexts; 1) school grounds and gardens; 2) farms and city farms; and 3) field study/nature centres. Dillon et al. (2005) concluded that E&L taking place in these outdoor classrooms has the potential to result in a broad range of positive impacts, in particular:

- Cognitive impacts: gaining knowledge and understanding, academic outcomes.
- Affective impacts: related to attitudes, values and beliefs e.g. gaining a sense of wonder, interest or respect for nature.

⁴ Relating to forms of learning which encompass both cognitive (relating to knowledge and understanding) and affective (relating to attitudes, values and beliefs) outcomes (see Rickinson, et al. 2007)

- Interpersonal/social impacts: improving communication skills, improving leadership expertise, working as part of a team.
- Physical/behavioural impacts: improving physical fitness, improving fine and gross motor skills, personal behaviour and social actions.

Rickinson et al. (2004 pp52) identified a number of factors which were associated with the more beneficial approaches to outdoor E&L:

- Sustained and longer experiences than the typical one off or short term programmes
- Programmes should be well designed and incorporate follow up work
- Activities should be carefully designed and linked to the school curriculum
- Educators should recognise the role of facilitation in the learning process
- The links between the programmes aims and practices should be close.

A small number of studies investigated the potential benefits of E&L in the outdoors to the health and wellbeing of those participating. For instance Lovell (2009) and Mygind (2007) showed that such educational experiences can result in significantly greater opportunities for physical activity than during typical school days. More broadly Mitchell and Shaw's (undated pp5) evaluation of the John Muir Award suggested that it has a *demonstrable contribution to make to the health...policy agenda in Scotland* and that the benefits were most apparent for more deprived communities.

Despite the relative wealth of evidence suggesting positive impacts of E&L in the outdoors there appears to be little which has focused on the outcomes of programmes using environmental based documentary or online resources (examples of which would be the FC Scotland 'Tree Trunk' resources or Woodland Trust's 'Nature Detectives') which are typically used indoors (Fein, et al. 2001). Furthermore the bulk of the research has focused on the relatively formal experiences provided for children and young people; there is only a small body of literature which has investigated adult provision or the more informal opportunities for any age group (examples include studies of the efficacy of interpretative media).

4.2 Benefits of tree, wood and forest education and learning

Whilst there is a research base which has documented the wide reaching benefits of E&L outdoors, there is relatively little that has focused specifically on E&L associated with trees or which takes place in woods or forests.

Forest School is probably the most widely documented and researched E&L initiative which takes place in woods and forests. A number of the evaluations and reviews were funded or supported by the Forestry Commission (Borradaile 2006; Lovell 2009a; O'Brien 2009; O'Brien and Murray 2007; Roe 2009), further studies were undertaken by researchers from other institutions and organisations (Davis, et al. 2006; Davis and Waite 2005; Eastwood and Mitchell 2003; Kenny 2009; Massey 2005; Maynard 2003; Maynard 2007a; Maynard 2007b; Swarbrick, et al. 2004).

One of the evaluations (O'Brien and Murray 2007) suggests that Forest School may result in the following impacts:

- Increased confidence, characterised by the self confidence and self belief that comes from children having the freedom, time and space to learn, grow and demonstrate independence.
- Increased social skills, characterised by an increased awareness of the consequences of actions on other people and the acquired ability to undertake activities with others. A study by Roe (2009) indicated that participation in Forest School can help young people at risk of social exclusion control their anger.
- Improved language and communication, characterised by the development of more sophisticated uses of written and spoken language, prompted by the visual and other sensory experiences of a child.
- Improved motivation and concentration, 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.
- Improved physical skills, characterised by the development of physical stamina and gross and fine motor skills. Further research by Lovell (2009a) suggests that Forest School results in greater levels of physical activity than in the typical school situation.
- Increased knowledge and understanding, characterised by a respect for the environment and an interest in their natural surroundings – making observations and insights into natural phenomena.

A key element to the above impacts is the regular attendance at Forest School over a period of time allowing children and young people to become familiar and comfortable with the woodland environment.

Scandinavian research suggests that nature kindergartens may have particular benefits. Fjørtoft (2001 ; 2004) found that outdoor play in a wooded environment, amongst Norwegian nature kindergarten pupils, resulted in significant increases in certain motor skills (co-ordination, balance skills and agility) in comparison to a control group. The use of an experimental design and objective measures allowed the author to confidently attribute the differences to the benefits of the natural environment. A Danish study found that activity levels during outdoor learning days (amongst older pupils - aged 10 to 11 years) in a forest environment resulted in greater amounts of activity than traditional school days (Mygind 2007). Swiss research suggested that a similar form of regular outdoor education has a number of benefits and that there was considerable interest in the approach from teachers (Knecht 2008). Mårtensson et al. (2009) examined the relationship between green space in pre-school play areas and attention deficit disorder. She surveyed a range of pre-schools and characterised these with regard to total outdoor areas accessible in pre-school, proportion of area containing shrubbery, trees or hilly terrain, and fraction of free sky above play areas. She found lower prevalence of attention deficit disorder symptoms among children whose pre-schools had more 'green' characteristics.

A small number of surveys and evaluations of forest and woodland interpretation were identified (Proctor 2004; Wilkinson 2007). A survey of interpretation use at Westonbirt in Gloucestershire found that while visitors were aware of resources few actually made use

of them; for example 39% of visitors surveyed used a resource to plan their visit, and only 5% actually followed the trail while at Westonbirt (Wilkinson 2007). However, both pieces of research suggest that interpretation of forests and woodlands are an appropriate method of reaching certain audiences.

The majority of the research reviewed above concluded that the specific woodland context in which these educational experiences took place was beneficial. However these findings should be treated with caution as few of the studies adequately compared the wood or forest environment with other environments (for instance moorland or coastal environments). No studies were found which rigorously compared the actual role of the environment in which the E&L took place on outcomes other than rates of physical activity or motor skills.

4.3 Uptake of, and participation in, outdoor and tree, wood and forest education and learning

Levels of provision and uptake

There appears to be relatively little information regarding the overall numbers participating in E&L in the outdoors or in relation to TWF, and what does exist is often contradictory.

The NFER (O'Donnel, et al. 2006) undertook a survey of current provision during their assessment of formal education outside of the classroom in England. Table 4 details their findings regarding provision of education outside of the classroom within English Primary, Secondary and Special schools.

Table 4: Provision of education outside the classroom within English schools (% of the total of the English schools which responded to the NFER survey during the academic year 2005/6)

Type of activity	Primary schools %	Secondary schools %	Special schools %
School site activities	95	98	98
Off-site activities	99	100	98
Before/after school study support	68	96	42
Off-site residential experiences within the UK	80	94	76
Non-residential activities during school holidays	28	72	37

The results indicated that there was a high level of provision for education outside the classroom across the school types. School site activities and off-site day visits were the most common types of education outside the classroom. The authors also noted that instead of the anticipated decline in provision, there was little evidence of such a trend and that provision may have actually increased in the five years previous to the study.

Nicol, et al.'s (2007) review of outdoor E&L in Scotland found that type of provision correlated with the stage of schooling, with pre-school centres favouring opportunities which gave participants a chance for play and primary schools focused on fieldwork and nature. Secondary schools predominantly chose to undertake adventure activities in the outdoors. Similarly to the report from the NFER (O'Donnell, et al. 2006), Nicol et al, (2007) reported considerable interest in the use of the outdoors for E&L purposes within the Scottish school system.

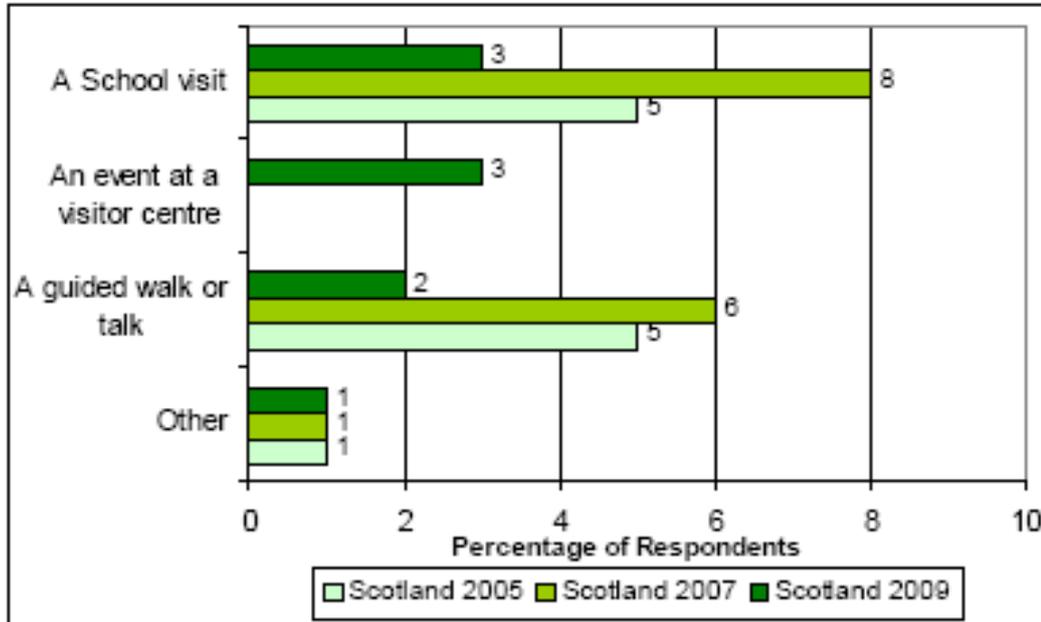
However the House of Commons Education and Skills Committee (2004) report into education outside of the classroom (which took evidence from policy makers, practitioners, providers and academics) concluded that *there has been a general decline in opportunities for education outside the classroom* (pp9). The decline had been observed at all levels of out of classroom E&L, from school grounds projects to residential adventure education. The authors noted that in the ten years previous to the report (1994-2004), twenty local authority outdoor education centres had closed. However, whilst the opportunities for E&L in the outdoors had declined, demand was increasing. Evidence given by the (then) Department for Education and Skills stated that *most LEAs tell us outdoor activity in their schools is stable or increasing* (pp9).

Edwards, et al.'s (2008a) investigation of the economic and social contribution of woodlands to the people of Scotland focused, in part, on opportunities for, and participation in, TWF E&L. The authors found that:

- 15% of the Scottish adult population, or members of their families, had participated in a forest-based organised learning activity or event in the previous 12 months (mid 2006-2007).
- 24% of the Scottish adult population who had visited woodlands in the previous 12 months had followed an interpreted trail.
- 24% of Scottish school children had attended a woodland based school trip in the previous 12 months. The authors estimated that as the children made an average of 2.3 visits per year, a total of around 510,000 E&L visits were made by school children to woodlands in Scotland.

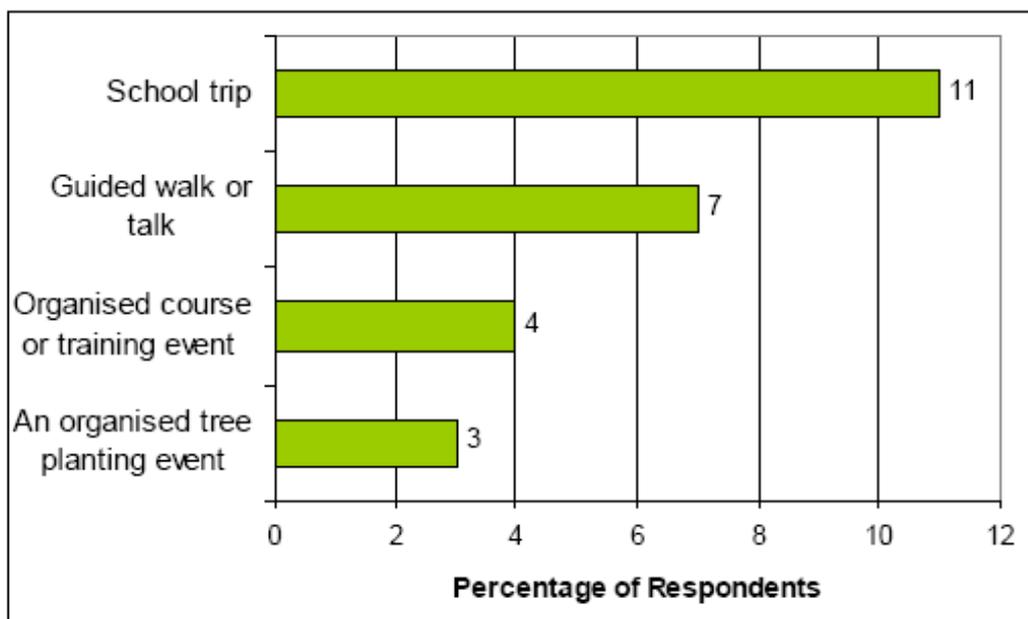
The public opinion survey of forestry (POF) in Scotland revealed the percentage of the population engaged in school visits, an event at a visitor centre, a guided walk or another organised learning activity in 2005, 2007 and 2009 (Figure 1).

Figure 1: Woodland learning activities attended (%) (Jamieson and Diggins, 2009)



In Wales the POF recorded the following in 2009 – Figure 2. The England POF does not record these learning activities.

Figure 2: Woodland learning activities attended by respondents or their families (Jamieson and Diggins, 2009)



Factors affecting provision of or uptake of more formal education and learning in the outdoors

A report by Nicol et al. (2007) summarised the findings of seven recent studies of outdoor education (predominantly in the Scottish context and funded by Scottish Natural Heritage and Learning Teaching Scotland). The research focused on a range of factors including the current state of outdoor education and the perspectives of both users and providers. The authors concluded that, although there is *strong and positive support for taking learning outdoors* amongst children, teachers and providers of outdoor education, greater uptake of opportunity has been prevented by a number of barriers, both perceptual and physical. Barriers identified included lack of resources or time, and issues associated with risk (pp10). Rickinson et al. (2004) also focused on the factors which influenced provision and uptake of outdoor E&L. They noted that although there are many commonly held perceptions regarding the barriers to outdoor E&L, relatively little formal research had investigated the impact of those factors. However what research was available indicated that the barriers to using the outdoors for E&L include:

- Concerns regarding the health and safety of outdoor E&L participants
- Lack of confidence amongst teachers and educators regarding using the outdoors for E&L
- The requirements of curriculums in formal education settings reducing flexibility in teaching approach and context
- Shortages of time and resources for E&L in the outdoors (e.g. transport costs)
- The effort associated with using the outdoors for E&L (for instance teachers may need parental permission, to organise transport, clothing, specialist teaching materials, and to recruit extra support to take a class into the outdoors).
- Less specialist expertise amongst educators and specialist advisory support for the use of the outdoors for E&L.

The authors noted that it is often the simplest factors, such as lack of resources (e.g. funds for transport or access to nearby suitable outdoor spaces), that act as the greatest barriers to outdoor E&L. Lack of confidence amongst teachers and educators may be due to not being exposed to outdoor learning as part of teacher training. A study by Hilmo and Holter (2004) explored how teachers in Norway remembered the outdoor education element of their main teaching program and how they used it in their own teaching practices. They interviewed preschool teachers who stressed the importance of their practical exposure to outdoor nature study during their education training.

Recent schemes such as the Learning Outside the Classroom Quality Badge (<http://www.lotcqualitybadge.org.uk/home>) and Forest School Quality Improvement Framework (http://www.foresteducation.org/forest_schools.php?page=8) can help to reassure schools and users by providing accreditation about the quality of education experiences offered and quality of provision of health and safety.

Destinations of education and learning in the outdoors

O'Donnell, et al. (2006) investigated the destinations of primary, secondary and special school outdoor E&L trips (day and residential); Table 5 details the findings which are of relevance to this paper (i.e. those destinations relating to the natural environment).

Table 5: Destinations (of relevance to this paper) of off-site education outside the classroom (% of the total of the English schools which responded to the NFER survey during the academic year 2005/6)

Destination	Foundation stage %	Key stage 1 %	Key stage 2 %	Key stage 3 %	Key stage 4 %	Special schools %
Urban Nature	38	52	45	8	24	70
Rural farms	29	22	29	2	2	56
Field studies centres	3	15	48	4	5	34
Environmental centres	14	18	49	3	3	51
National nature reserves / SSSIs ⁵	13	18	39	4	4	57
Forests / Woodlands	21	29	44	6	4	80
General countryside	16	31	52	8	9	81
Outdoor pursuits / adventure centres	5	8	67	13	9	72

Although the overall findings suggest that the most popular destinations tended to be man-made environments (e.g. urban areas, places of worship / community centres, places of historical interest) there was significant use of natural environments and, in particular, of woods and forests. Use of all types of natural environments was considerably higher amongst the primary stages (foundation stage and key stages 1 and 2) and in special schools. Trips to woods and forests were associated with geography, science and PSHE (physical, social and health education). Interviews with teachers revealed that the choice of destination depended on the availability of appropriate locations within a close proximity to the school, as teachers preferred to not travel far. For instance secondary schools in rural areas were more likely to have visited the countryside than those in urban areas. Teachers also reported preferring to visit places which had been recommended to them or with which they already had a relationship. The extent of the individual teacher's training also had an impact on choice of destination. Teachers who had undertaken a greater degree of training in education outside of the classroom were more likely to take key stage 3 and 4 pupils to forests and woodlands or other countryside destinations.

⁵ SSSIs – Sites of Special Scientific Interest

4.4 Perceptions of the value of tree, wood and forest education and learning

Research suggests that use of the outdoors, and more specifically the particular context of woods or forests, for E&L, is supported by the general public, educators and E&L participants.

The 2007 Public Opinion of Forestry (POF) (Grant and Smilie 2007) survey found that over 90% (43% strongly agree and 51% agree) of the respondents agreed that 'woods allow families to learn about nature'. Similarly over 90% (46% strongly agree and 47% agree) agreed that woodlands play an important role in children and young people's outdoor learning experience. The most recent POF survey (Economics and Statistics 2009) also examined people's perceptions of using woods and forests for learning and education; finding that 82% agreed that 'woodlands are good places for children to learn about the outdoors'. More broadly 48% of the respondents agreed that woodlands provide places for learning, 91% agreed that woods are places where people can learn about the environment and 69% agreed that they are places where people can learn about local culture or history.

The perceptions of head teachers regarding education outside of the classroom were investigated by the NFER (O'Donnell, et al. 2006). Overall perceptions were positive, with heads viewing such opportunities to be *an integral part of the learning and development of pupils in their school* (pp34). The majority of the head teachers ($\geq 92\%$) agreed that education outside of the classroom (to both natural and man-made environments) had positive impacts on:

- Broadening pupils experiences
- The school ethos
- Pupil's attitudes and values
- Pupil's communication and social skills
- Pupil's behaviour and motivation.

Positive perceptions of E&L in the outdoors amongst Scottish children and young people were noted by Nicol et al. (2007). They found that children and young people valued a broad range of opportunities; from formal curriculum based to more informal recreational and family orientated E&L. The authors noted that the most highly valued experiences were:

- Fun and enjoyable
- Novel
- Ones which allowed the children and young people to feel uninhibited, 'free', and close to nature through practical activities, encounters with animals and exposure to the weather
- Ones which gave the participants opportunities to set their own agenda and to work at their own pace

Despite these positive perceptions many of the young people thought that *mainstream youth cultures does not consider all outdoor activity to be 'cool'* (pp5).

4.5 Forestry Commission research, monitoring and evaluation

Forest Research (FR) has carried out a number of studies and evaluations which contributes towards the evidence base relating to the impacts of TWF E&L and which are of relevance; these include the Forest School evaluations mentioned previously (O'Brien and Murray 2006; O'Brien and Murray 2007), a review of education provision by FCS (O'Brien, 2006), and wider evaluations of the social benefits of TWF (Edwards, et al. 2008b). Further examples include the 'Offenders in Nature' evaluation, which found that participants *learn basic conservation and forest management skills* (Carter 2008 pp2), and a study which focused on environmental volunteering (O'Brien 2008). Research by Lovell (2009b) focused on school children's perceptions of climate change and the role of trees, woods and forests. FR has also carried out research about the value of woodlands to people and learning opportunities afforded by woodlands are often raised as important. People in focus groups in a number of studies have talked about the importance of passing on knowledge about the environment and plants to their children or grandchildren (O'Brien 2004, O'Brien, 2005, O'Brien, 2006), and engendering interest and respect in children and young people towards the natural environment.

Wilkinson (2008) evaluated the FC's role in communicating the issues surrounding climate change. A piece of research, part funded by FCS, assessed the feasibility of Forest Kindergartens in the South West of Scotland (Robertson, et al. 2009) and an evaluation of Forest School was funded by FCS in 2006 (Borradaile).

The Forestry Commission also carries out a range of surveys which provide evidence of interest for this review. The Public Opinion of Forestry surveys have, in certain years and in each country, included questions which were designed to investigate E&L attendance and perceptions – see previous section.

The education and recreation services of FC in each country also conduct monitoring and evaluation of their provision (for example Muir and West 2002; Wilson 2005-6). FC in each country uses an education, events and permissions booking system to collect data about the use of the estates for E&L related activity. In England a new booking and evaluation form has been developed by Forest Research and consultants have developed a new database. Sites that run a lot of education activities usually file all information about a visit including programme, learning objectives, evaluation form and how payment was made. Information is kept on education as participants/schools have to make a booking to benefit from the education service. However there may be differences in the data collected between districts which cannot easily be joined together to provide an overall view of what is taking place.

5. Research gaps and needs

This review has highlighted that there are a number of gaps in the evidence base regarding E&L in the outdoors, and in particular, that relating to TWF.

Impacts of the specific environment of TWF on E&L outcomes

There appears to be **no research which has directly investigated the impact of using woodland or forests as a context for E&L**. Whilst there is a small body of research which has investigated programmes which take place in such environments, those studies have not adequately investigated the specific impact of the particular environment. No comparisons of the impacts of using different natural environments have been carried out. It is suggested that attention could be paid to understanding what woodlands or forests offer (factors which may be positive or negative) that other outdoor environments do not or cannot.

The impacts of the different types of TWF E&L provision

Due to the small body of evidence it is difficult to draw conclusions about the benefits of the different types of TWF related E&L. For example there has been no comparison of the different forms of curriculum linked TWF focused E&L (e.g. individual day-visits to woods or forests in comparison to sustained experiences such as Forest School). **It is highly likely that the variation in length of, intensity and type of exposure between these forms of E&L result in important differences in outcomes and impacts for different groups**. Similarly there appears to have been little evaluation of the outcomes of vocational training the Forestry Commission and other organisations deliver.

Impacts of TWF E&L on educational outcomes

Much of the evidence identified during this review has focused on personal, social, emotional and/or physical outcomes of TWF E&L, relatively little attention has been paid to specific educational outcomes. It does not appear to be known **what impact E&L in the outdoors and in particular that in the specific context of TWF has on long-term educational (and equally lifelong) achievement and attainment**. This would require longitudinal research.

Longer term impacts of E&L in the outdoors

A key point highlighted in the review of evidence relating to the benefits of E&L in the outdoors (Dillon, et al. 2005; Nicol, et al. 2007; Rickinson, et al. 2004) is that little work has focused on longer term impacts or outcomes. This is especially true of research focusing on E&L in relation to TWF. **It is, therefore, suggested that research could focus on what long term impacts and outcomes (for example, perceptions of TWF, use of such environments and wider environmental perceptions, knowledge and behaviours) these types of E&L have.**

Wider impacts of E&L

The E&L that is delivered by the Forestry Commission in each country and other such organisations is likely to have a variety of impacts that go beyond the individual participating and the basic educational outcomes identified in the reviews of the evidence. Whilst some research projects have focused on the health and wellbeing impacts of participation in TWF E&L (Lovell 2009a; Roe 2009) attention could be paid to what is described as the 'ripple effect'. **Therefore it is suggested that research could investigate potential wider impacts of TWF E&L to the individual (e.g. health and wellbeing or employment and economic factors) and to the community.**

Greater focus on different groups

It should also be noted that there appears to be a greater emphasis and interest in the provision and impacts of outdoor E&L for children and young people. Whilst there are numerous evaluations of the impacts of adult focused programmes in the outdoors (examples include BTCV Accessed January 2008; BTCV 2004; Pretty, et al. 2005) these have tended to investigate the potential health and wellbeing benefits rather than those relating to E&L. **Therefore it is suggested that attention could be paid to the impacts of the various forms of E&L in relation to TWF for different populations, in particular adult participants.**

It has also been suggested that the potential variation in provision for, use and experience amongst wider populations (e.g. socio-economic status, gender, ethnicity, religious/cultural and physical or mental ability) should be investigated (Rickinson, et al. 2004).

Methodological issues

Rickinson et al. (2004) noted that there are a number of methodological issues and weaknesses evident in much of the research discussed previously; therefore **reliable and rigorous evidence of the benefits of E&L in the outdoors is somewhat limited**. This is primarily due to the reliance on cross sectional designs (meaning that the longer term impacts of the experiences cannot be assessed) and, in some cases, on untested self-perceived measures of change. They also noted that broad generalisations are sometimes made from small samples, a point which is pertinent when considering the diversity of E&L in the outdoors.

Research needs specific to the Forestry Commission

While the research gaps already outlined will be of interest to FC, there is potential research which could be of particular relevance. For example, it appears that little attention has been paid to investigating who is and who is not using TWF as a context for E&L, and in particular those opportunities offered by the FC (particularly for older participants). It is suggested that such research could focus on investigating:

- Knowledge of FC and of the E&L opportunities it offers.
- The expectations of such opportunities.
- Why existing users take up such opportunities.
- Why non-users have not engaged.

It may also be worthwhile evaluating the costs and benefits of providing different forms of E&L provision; for example, are the outcomes of sustained experience such as Forest School cost effective? Finally it is suggested that a comparison – in terms of cost-effectiveness, outcomes and processes - of the E&L directly delivered by FC staff against the E&L supported (monetarily or otherwise) by FC, would be potentially valuable to future decision making.

Whilst it is recognised that considerable effort is currently put into monitoring and evaluating FC E&L activity and provision, it is suggested that to further knowledge regarding the use and benefits of TWF for E&L, the FC in each country could (if it felt that more comprehensive data was needed regarding its E&L activities) consider the following:

- Ensure some standardisation of data recording across the Forestry Commission
- Collect more comprehensive information, perhaps through the permissions system, regarding the use of the Public Forest Estate for E&L by other organisations and groups leading activities in forests.
- Collate and hold centrally, information on the full range of projects and programmes (E&L and non-E&L activities) in which FC is involved (direct delivery, partnership or part funded).

6. Conclusions

This review of evidence has highlighted that there is a small, but growing, body of evidence regarding the benefits of using the outdoors as a context for E&L. However there is little research that has specifically investigated E&L in, or focused on, TWF, apart from the studies of the impacts of Forest School on children and young people.

The breadth of TWF projects, programmes and activities which have the potential to result in E&L outcomes has had a number of impacts on the quantity of evidence available. Firstly, the sheer variety of projects, programmes and activities has meant that many have not been researched. Secondly, learning is a lifelong activity, therefore TWF E&L participants range from the youngest to the oldest members of society, and represent the full range of socio demographic groups. The outcomes of TWF E&L are likely to vary for each of these groups. Thirdly, the issues surrounding the identification and categorisation of projects, programmes and activities as having potential E&L outcomes are related to the narrow evidence base. While certain programmes, such as Forest School, are clearly identifiable as having E&L objectives and outcomes, others, such as voluntary projects, are likely to result in learning but may not be specifically focused on such outcomes. Research on Forest School has been undertaken because not only are a wide range of people and organisations interested in the approach, the programme is clearly identifiable as having E&L objectives. Therefore there has been a focus on Forest School as a case study in order to understand the role of TWF in E&L.

Whilst the research needs identified in the previous sections are all important it is recognised that many would be particularly time-, resource- and effort-intensive. We have suggested that to investigate the particular impacts and outcomes (especially those relating to education achievement) of E&L which takes place in woods or forests, longitudinal or semi-experimental studies are important. This is also true of any study which aimed to investigate the role of a particular environment. It is only through the use of such methods that we can begin to identify the various factors which may be influencing the specific outcomes observed.

Further research could provide a clearer picture of the benefits of TWF E&L and aid in determining how future resources can best be focused or utilised.

7. References

- Blunkett, D.** 1998 'The Learning Age; a renaissance for a new Britain: Green Paper', England: DfEE.
- Borradaile, L.** 2006 'Forest School Scotland: An Evaluation', Edinburgh: Forestry Commission Scotland
- British Trust for Conservation Volunteers** Accessed January 2008 *Green Gym Research Summary*, http://www2.btcv.org.uk/gg_summary.pdf.
- BTCV** 2004 'Wellbeing comes naturally... Evaluation of the Portslade Green Gym', Vol. 2004: BTCV.
- Carter, C.** 2008 'Offenders and nature: policy into practice', Farnham Forest Research.
- Davis, B., Rea, T. and Waite, S.** 2006 'The special nature of the outdoors: Its contribution to the education of children aged 3-11', *Australian Journal of Outdoor Education* 10(2): 3-12.
- Davis, B. and Waite, S.** 2005 'Forest School: Opportunities and Challenges in Early Years ', University of Plymouth.
- DCELLS** 2008 'Framework for Children's Learning for 3 to 7-year-olds in Wales ', Cardiff: Welsh Assembly Government.
- Department for Food and Rural Affairs** 2007 'A strategy for England's trees, woods and forests', London.
- Dillon, J., Morris, M., O'Donnell, L., Reid, A., Rickinson, M. and Scott, W.** 2005 'Engaging and learning with the outdoors - the final report of the outdoor classroom in a rural context action research project': National Foundation for Educational Research.
- Eastwood, G. and Mitchell, H.** 2003 'An evaluation of the first three years of the Oxfordshire Forest School project', Oxford: Oxfordshire County Council.
- Economics and Statistics** 2009 'UK public opinion of forestry 2009 - Data tables', Edinburgh Forestry Commission.
- Edwards, D., Morris, J., O'Brien, L., Sarajevs, V. and Valatin, G.** 2008a 'The economic and social contribution of forestry for people in Scotland ' *Research Note*: Forest Research
- Edwards, D., O'Brien, L., Sarajevs, V. and Valatin, G.** 2008b 'A valuation of the social and economic contribution of forestry for people in Scotland', Farnham: Forest Research
- Fein, J., Scott, W. and Tilbury, D.** 2001 'Education and conservation: lessons from an evaluation', *Environmental Education Research* 7(4): 329-395.
- Fjørtoft, I.** 2001 'The Natural Environment as a Playground for Children: The Impact of Outdoor Play Activities in Pre-Primary School Children', *Early Childhood Education Journal* 29(2): 111-117.
- 2004 'Landscape as Playscape: The Effects of Natural Environments on Children's Play and Motor Development', *Children, Youth and Environments* 14(2): 21-44.
- Forestry Commission England** 2009 'Leafing the classroom - A strategy for Education and Learning Services for Forestry Commission England 2008-2012 '.
- Forestry Commission Scotland** 2006 'The Scottish Forestry Strategy', Edinburgh
- 2009a 'Central Scotland / Scottish Lowlands Education Strategy 2009-10', Edinburgh
- 2009b 'Woods for learning', Edinburgh
- 2009c 'Woods for Learning - Education Strategy', Edinburgh: Forestry Commission.

- Forestry Commission Wales** 2004 'Forestry Commission Wales' Strategy for Education 2004-2014 (draft)'.
— 2007 'Woodlands for learning', Cardiff.
- Forestry Commission Anon.** 2010. Operational Guidance: Managing Recreation - a guide for FC staff. Forestry Commission.
- Grant, N. and Smilie, A.** 2007 'UK public opinion of forestry 2007', Edinburgh Forestry Commission.
- Harrop, P. and Groves, F.** 2006 'A framework for education and learning services': Forestry Commission England.
- Hattie, J. A., Marsh, H. W., Neill, J. T. and Richards, G. E.** 1997 'Adventure education and Outward Bound: Out-of-class experiences that make a lasting difference', *Review of Educational Research* 67(1): 43-87.
- Hilmo, I. and Holter, K.** 2004. På jakt etter skogens kongle. (How to find the cones in the wood). Report from Oslo University College No. 31.
- House of Commons Education and Skills Committee** 2005 'Education outside the classroom ', London: The Stationary Office.
- Jameison, N and Diggins, G.** 2009. Public opinion of forestry 2009, Wales. Forestry Commission Wales, Edinburgh.
- Jameison, N and Diggins, G.** 2009. Public opinion of forestry 2009, Scotland. Forestry Commission Scotland, Edinburgh.
- Kenny, R.** 2009 'Involve, Enjoy, Achieve: Forest School evaluation project', <http://www.forestofavon.org.uk/sites/default/files/Forest%20School%20Evaluation%20Project.pdf> Accessed May 2009: Forest of Avon.
- Knecht, S.** 2008 'Benefits and Challenges of Forest Education in Primary Schools in the Canton of Zurich, Switzerland ', Zurich: University of Zurich.
- Kneller, G. F.** 1971 *Introduction to the Philosophy of Education*, New York: John Wiley and Sons.
- Louv, R.** 2005 *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder*, New York: Algonquin Books.
- Lovell, R.** 2009a 'Physical activity at Forest School ' *Access and Health* Edinburgh Forestry Commission Scotland.
— 2009b 'Wood you believe it? Children's perceptions of climate change and the role of trees, woods and forests', Farnham: Forest Research
- Massey, S.** 2005 'The benefits of Forest School experience for children in their Early Years': Worcestershire LEA.
- Maynard, T.** 2003 'Forest School Swansea Port Talbot: An Evaluation', University of Wales Swansea: Unpublished.
— 2007a 'Forest Schools in Great Britain: An initial exploration', *Contemporary Issues in Early Childhood* 8(4): 320-331.
— 2007b 'A Risky Business? Encounters with Forest School and Foucault', *Education* 3-13 35(4): 379-391.
- Muir, T. and West, V.** 2002 'Schools education service survey 2002', Edinburgh Forestry Commission Wales.
- Mygind, E.** 2007 'A comparison between children's physical activity levels at school and learning in an outdoor environment', *Journal of Adventure Education and Outdoor Learning* 7(2): 161-176.
- Nicol, R., Higgins, P., Ross, H. and Mannion, G.** 2007 'Outdoor Education in Scotland: A Summary of Recent Research', Perth: Outdoor Connections, SNH, LTS.

- O'Brien, E. 2005.** Bringing together ideas of social enterprise, education and community woodland: the hill holt wood approach. *Scottish Forestry* 59: 7-14.
- O'Brien, E. 2005.** Publics and woodlands: well-being, local identity, social learning, conflict and management. *Forestry*, 78: 321-336.
- O'Brien, E. A. 2006** 'Survey of formal education (3-18) undertaken and delivered by Forestry Commission Scotland', Farnham Forest Research.
- O'Brien, E. 2006.** Social housing and greenspace: a case study in inner London. *Forestry*, 79: 535-549.
- O'Brien, L. and Murray, R. 2006** 'A marvellous opportunity for children to learn: A participatory evaluation of forest school in England and Wales', Farnham: Forest Research.
- 2007 'Forest School and its impacts on young children: Case studies in Britain', *Urban Forestry & Urban Greening* 6(4): 249-265.
- O'Brien, L. 2009** 'Learning outdoors: the Forest School approach ', *Education 3-13* 37(1): 45-60.
- O'Brien, L., Burls, A., Bentsen, P., Hilmo, I., Holter, K., Haberling, D., Pirnat, J., Sarv, M., Vilbaste, K. and McLoughlin, J. 2010** 'Outdoor education, life long learning and skills development in woodlands and green spaces: the potential links to health and well-being' (*in press*).
- O'Donnel, L., Morris, M. and Wilson, R. 2006** 'Education outside the classroom: An assessment of activity and practice in schools and Local Authorities', London: NFER.
- OFSTED 2004** 'Outdoor Education - Aspects of good practice', London: Department for Education and Skills.
- Peacock, A. 2006** 'Changing Minds: The lasting impact of school trips', Exeter: University of Exeter.
- Pretty, J., Griffin, M., Peacock, J., Hine, R., Sellins, M. and South, N. 2005** 'A countryside for health and wellbeing: The physical and mental health benefits of green exercise', *Countryside Recreation* 13(1): 2-8.
- Proctor, J. M. 2004** 'Forest Service interpretation: A qualitative, multiple-unit, cost-effectiveness case study', United States -- Colorado: University of Denver.
- Rickinson, M., Dillon, J., Teamey, K., Morris, M., Young Choi, M., Sanders, D. and Benefield, P. 2004** *A review of research on outdoor learning*, London: National Foundation for Educational Research and King's College London.
- Robertson, J., Martin, P., Bporradaile, L. and Alker, S. 2009** 'Forest Kindergarten feasibility study', Glasgow GCV Green Network : Forestry Commission Scotland.
- Roe, J. 2009** 'Forest School and restorative health benefits in young people with varying emotional health' *Access and Health* Edinburgh Forestry Commission Scotland.
- Scottish Government 2007** 'Skills for Scotland', Edinburgh
- 2009 'The Early Years Framework', Edinburgh
- Accessed 2009 'A Curriculum for Excellence', <http://www.ltscotland.org.uk/curriculumforexcellence/>.
- Swarbrick, N., Eastwood, G. and Tutton, K. 2004** 'Self-esteem and successful interaction as part of the forest school project', *Support for Learning* 19(3): 142-146.
- Wallace, H. 2009** 'Teaching amongst the trees: Alice Holt education and learning strategy', South East England Forest District.
- Welsh Assembly Government 2009a** 'Woodlands for Wales ', Aberystwyth.
- 2009b 'Woodlands for Wales - Summary ', Aberystwyth.

- Wilkinson, S.** 2007 'Westonbirt interpretation survey 2007': Forestry Commission England
— 2008 'A scoping report examining the Forestry Commission niche in communicating climate change in England, and recommendations for further work', Westonbirt Forestry Commission England.
- Wilson, M.** 2005-6 'Schools education service survey 2005/6', Edinburgh Forestry Commission Wales.

Appendices

- Appendix 1: Acronyms**
- Appendix 2: Policy background to trees, woods and forests education and learning in England, Scotland and Wales**
- Appendix 3: Forestry Commission education and learning strategies**
- Appendix 4: Examples of trees, woods and forests education and learning providers**
- Appendix 5: Examples of trees, woods and forests education and learning initiatives**
- Appendix 6: Examples of Forestry Commission trees, woods and forests education and learning projects and programmes**
- Appendix 7: Results of the literature review**

Appendix 1. Acronyms

BTCV	British Trust for Conservation Volunteers
CPD	Continued Professional Development
DCELLS	Department for Children, Education, Lifelong Learning and Skills
DCSF	Department for Children, Schools and Families
E&L	Education and Learning
FEI	Forest Education Initiative
FC	Forestry Commission
FCE	Forestry Commission England
FCS	Forestry Commission Scotland
FCW	Forestry Commission Wales
FFEC	Forest for Every Classroom
LOTG	Learning Outside the Classroom
NFER	National Foundation for Education Research
NGO	Non-governmental organisations
OFSTED	Office for Standards in Education, Children's Services and Skills
PLT	Project Learning Tree
POF	Public opinion of forestry
TWF	Trees, woods and forests
U3A	University of the Third Age
WAG	Welsh Assembly Government
WICKED	Woodland Initiatives – a Catalyst for Kids' Education and Development

Appendix 2. Policy background to tree, wood and forest education and learning in England, Scotland and Wales

Education and learning in England

Lifelong learning has been explicitly supported by the current Labour government since it took power in 1997. In the foreword to the green paper 'The Learning Age', David Blunkett (1998), the then education secretary for England, stated: *Learning throughout life will build human capital by encouraging the acquisition of knowledge and skills and emphasising creativity and imagination. The fostering of an enquiring mind and the love of learning are essential to our future success...*

E&L is managed by the Department for Children, Schools and Families⁶ and the Department for Business, Innovation and Skills⁷. Local Authorities have responsibility for providing formal statutory education within schools. Twelve subjects are included in the National Curriculum, with three core subjects of English, Maths and Science.

In England there is increasing support for education outside the classroom. In 2004-2005 a wide ranging parliamentary enquiry focused on education outside of the classroom (House of Commons Education and Skills Committee 2005). In 2006 the 'Learning Outside of the Classroom' manifesto⁸ was launched; the aim of which is to promote the benefits of this approach and to support the delivery of E&L outside of the classroom. Education providers and other interested organisations are asked to pledge their support to the movement (there are currently more than 1600 signatories including FCE and FCS: FCW supports the Real World Learning Campaign Cymru⁹).

E&L in the outdoors for those in fulltime education is not written into the curriculum but it is promoted to teachers and educators through LOTC and the new 'Learning Outside the Classroom Innovation and Excellence 2009' awards and quality badge system¹⁰. Children's entitlement to high quality outdoor play experiences are emphasised throughout the Early Years Foundation Stage guidance and early years providers have a statutory duty to facilitate daily outdoor opportunities all year round for the children in their care¹¹. However there was resistance to the idea of statutory provision of outdoor E&L for school aged children during a recent review (House of Commons Education and Skills Committee 2005)¹².

⁶ www.dcsf.gov.uk/

⁷ www.bis.gov.uk/

⁸ www.lotc.org.uk/

⁹ www.field-studies-council.org/campaigns/rwl/index.aspx for more details

¹⁰ www.lotc.org.uk/The-LOTc-quality-badge/The-LOTc-quality-badge

¹¹ EYFS Statutory Framework (p.35 and 37); EYFS Practice Guidance (p. 7) and 'Principles into Practice card 3.3: Enabling Environments - the learning environment'

www.lotc.org.uk/getdoc/31fc5e53-74a2-45ab-98f7-1ecf15c137fe/Early-years

¹² www.publications.parliament.uk/pa/cm200405/cmselect/cmmeduski/120/12007.htm

Education and learning in Wales

As with England lifelong learning is key to Welsh policy. The Welsh Assembly government stated, '*The Welsh Assembly Government aims to raise the levels of achievement of the people of Wales through its education and training policies. Through these policies it aims to achieve a social and economic well being that is vital to developing a prosperous economy*'¹³.

Education is a devolved matter and is implemented and managed by the Department for Children, Education, Lifelong Learning and Skills (DCELLS) within the Welsh Assembly Government¹⁴. Welsh schools also follow a national curriculum similar to that in England but with the addition of requirements for Welsh Language. In September 2008 the Foundation Phase was created (for children between 3 and 7) and will be implemented over the following four years. This phase of schooling has a focus on experiential learning and the emphasis on the use of the outdoors is made explicit in the Foundation Phase curriculum (DCELLS 2008) It is stated that children will experience *activities in the outdoors where they have first-hand experience of solving real-life problems and learn about conservation and sustainability*¹⁵. Further opportunities for E&L in the outdoors are provided by the 14-19 Pathways route which focuses on vocational training and through the forthcoming Welsh Baccalaureate which includes land based and environmental options.

Education and learning in Scotland

The Scottish Government has similar hopes for lifelong learning to England and Wales, stating that *The Government wants to ensure that everybody has access to learning opportunities that can help them achieve their full potential... to ensure that learning is open to everyone at any age*¹⁶. Scotland has a lifelong learning skills strategy 'Skills for Scotland' (Scottish Government 2007).

E&L in Scotland is the responsibility of the Scottish Government through the three Education and Lifelong Learning Directorates (which replaced the Enterprise, Transport and Lifelong Learning Department in 2007). The three directorates are:

- Children, Young People and Social Care
- Schools
- Lifelong Learning

¹³ www.wales.gov.uk/topics/educationandskills/policy_strategy_and_planning/;jsessionid=LmGGK BGKD7NdyVPy1TVZLS2hpBjTH1rqXvxlHpCvWjmhRNfHQtvY!1922798813?lang=en

¹⁴ www.new.wales.gov.uk/topics/educationandskills/;jsessionid=XmPCKBHFvsxTbhmxDJ1Kl4jBqSP pjqYRLvZ2yb2XjvhyY1hGPWNB!1922798813?lang=en

¹⁵ www.wales.gov.uk/topics/educationandskills/policy_strategy_and_planning/104009-wag/foundation_phase/?lang=en

¹⁶ www.scotland.gov.uk/Topics/Education

Scottish schools follow the 'Curriculum for Excellence'¹⁷ (at all stages, from 3-18 years: *The purpose of Curriculum for Excellence is encapsulated in the four capacities – to enable each child or young person to be a successful learner, a confident individual, a responsible citizen and an effective contributor*¹⁸).

In Scotland, the Curriculum for Excellence (Scottish Government Accessed 2009), in part, focuses on taking E&L out of the classroom with particular reference to opportunities for motivating learning through activity outdoors, however it is not a statutory duty. Learning Teaching Scotland (LTS) have an extensive website promoting and supporting the delivery of E&L in the outdoors¹⁹. Use of the outdoors for E&L is linked to the health and wellbeing agenda, for instance through the 'Early Years Framework' (Scottish Government 2009). One of the aims of this strategy is to improve the health and wellbeing of children (pre-school to 8 years) through providing opportunities for play and the use of natural environment which it is argued will enhance the development of cognitive and other social skills.

¹⁷ www.ltscotland.org.uk/curriculumforexcellence/

¹⁸ www.ltscotland.org.uk/curriculumforexcellence/curriculumoverview/index.asp

¹⁹ www.ltscotland.org.uk/outdoorlearning/index.asp

Appendix 3. Forestry Commission education and learning strategies

The support for E&L in the outdoors is of particular relevance to FC, collectively one of the largest land managers in Britain. There are multiple levels of policy and strategy which vary between the countries.

England

E&L priorities are set out in the 'Strategy for England's trees, woods and forests' delivery plan (Department for Food and Rural Affairs 2007), these include the intention that efforts should be made to educate the public about the role of TWF in mitigating climate change, wood as a sustainable resource, and the wider ecological and environmental benefits of TWF.

'Leafing the Classroom: Strategy for Forestry Commission Estate Education and Learning Services' (2009) details specific E&L strategy on the public forest estate in England. It highlights the variety of TWF E&L currently taking place and aims to ensure that delivery - through Forestry Commission employees, partnerships and facilitation (e.g. through funding such as the relevant grants schemes and challenge funds) - is efficient and effective. More detail can be found in Table 6.

Each FCE region also has their own local strategy (for example see Wallace 2009). These regional strategies respond to local E&L audience, needs and FCE's regional delivery potential.

Wales

The Welsh Assembly Government first published 'Woodlands for Wales' in 2001, it has since updated the strategy (Welsh Assembly Government 2009a). This strategy places E&L at the heart of its woodlands for people policies, stating that it intends to ensure that *more people enjoy the lifelong learning benefits of woodlands and their products, use woodland as a setting for learning and play throughout their lives and gain a better understanding of the wider role of woodlands and trees* (Welsh Assembly Government 2009b).

'Woodland for learning and the learning country' is FCW's E&L strategy (2007), details can be found in Table 6. The strategy document sets out FCW's approach to TWF E&L; particular emphasis is placed on:

- Providing quality learning experiences using woodlands
 - Acting as a key facilitator to enable other to use woodlands for learning
 - Working with partners to influence learning policy and practice
- (Forestry Commission Wales 2007 pp7)

Scotland

'The Scottish Forestry Strategy' (2006) sets out Forestry Commission Scotland's role in E&L, it has a number of key objectives which include:

- Increasing the use of woods and forests within the education sector
- Support TWF E&L initiatives such as Forest School and the FEI
- Encourage uptake of opportunities for the development of forestry skills and vocational training

The 'Woods For Learning' strategy (Forestry Commission Scotland 2009b) gives greater detail regarding Forestry Commission Scotland's delivery and facilitation of TWF E&L (see table 6). Its priorities are to support those who work with young people in the outdoors to use TWF and to help enhance E&L through *challenging, active and fun ways that help young people make connections with the natural world around them* (pp 12).

Geographical regions (roughly covering one Forest District and one Conservancy) in Scotland also produce an E&L strategy (for example Forestry Commission Scotland 2009a) which responds to local needs, audience and delivery potential.

Table 6. Details of education and learning delivery strategies for Forestry Commission England, Scotland and Wales

Country strategy	E&L objectives	E&L outcomes or indicators of success
FC England 'Leafing the classroom'	Encourage a greater understanding of woodlands, trees and their place in the wider environment, leading to respect, responsible behaviour and positive attitudes towards the environment as a whole and a sustainable future	Success will be indicated by: <ul style="list-style-type: none"> • Increase in knowledge and understanding about trees and woods • Evidence of enjoyment, inspiration and creativity increasing peoples use of forests • Increase in skills for everyday life • Change in attitudes or values towards trees and the environment helping people to impacts less on the planet • Evidence of activity or modification of behaviour, which will help improve
	Assist in achievement of a number of related government targets not specific to forestry <i>e.g.</i> Actions on climate change, national curriculum and pupil achievement, Learning outside of the classroom manifesto, social and emotional aspects of learning objectives and global plants conservation strategy	

	<p>Broaden the range of delivery including techniques, programmes and location to ensure the widest possible audience hears the Forestry Commission messages</p>	<p>society, local communities and the environment locally and globally</p>
	<p>Outreach work should be used to reach new/remote communities who may not have the means to travel to a Forestry Commission site or where schools and communities have the capacity to access local woodlands</p>	
	<p>Extend knowledge transfer to further and higher education groups and other lifelong learning opportunities in line with the government policies on developing skills and England's TWF intentions</p>	
<p>FC Wales 'Woodlands for learning and the Learning Country'</p>	<p>Direct delivery: working directly with learners to use woodlands for learning. We work directly with learners, sharing stimulating activities linked to the national curriculum or other learning goals, dependant on the learners needs.</p>	<p>Qualitative feedback from teachers and children number of children learning in and about woodlands working with our staff directly requests for repeat visits or continued working with any aspect of our service</p>

	<p>Facilitating: helping others use woodlands for learning</p>	<p>Number of active FEI cluster groups and partnership projects Number of people undergoing/completed accredited Forest School Training provided through FCW Number of training days for educational professionals</p>
	<p>Influencing: showing others the value of using woodlands for learning. We work to inspire and assist teachers and others to use woodland settings for enriching and extending education provision.</p>	<p>Inclusion of woodlands and outdoors in leaning developments such as the foundation phase Use of woodlands for learning as demonstrated at conferences, in news reports and in research papers Level of promotion though conferences and press/broadcast media</p>
<p>FC Scotland 'Woods for learning'</p>	<p>Increasing the opportunities for use of forests for education and play</p>	<p>Success in 2013 will be measured against the following indicators:</p> <ul style="list-style-type: none"> • Has FCS increased opportunities for adults and children to regularly use woodlands for learning? • Has the number of schools/nurseries working with 3-18 year olds using woods for learning increased? • Has learning opportunities in woodlands increased? • Are there more educational professionals using woodlands to deliver the 'curriculum for Excellence' increased? • Do they have a better understanding of what it is about TWF that are good for learning? • Have they strengthened the links between health and learning
	<p>Provide information on learning sites close to schools</p>	
	<p>Provide teaching and learning resources, to deliver the 'Curriculum for Excellence' outdoors, including opportunities to recognise achievement</p>	
	<p>Continue to support, strengthen and recognise the FEI partnership</p>	
	<p>Provide CPD for teachers to help deliver the 'Curriculum for Excellence'</p>	

	<p>Increase the number of Forest Schools and Forest Kindergartens</p>	
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There are a number of common themes across the three national strategies (*Woods for Learning* (Forestry Commission Scotland 2009c), *Woodlands for Learning* (Forestry Commission Wales 2007) and *Leafing the Classroom* (Forestry Commission England 2009)):

- The potential contribution of woods and forests to lifelong learning, skills development and enhancing social capital; the breadth of the potential was recognised in the FCW strategy (2007) *woodlands can offer an outstanding learning resource...for all kinds of learning, for all kinds of people.*
- The potential use of woods and forests to encourage behaviour change – particular reference is made in relation to climate change adaptation, anti social behaviour and social justice. For instance the FCE education strategy (2009) states that it aims to promote, *a greater understanding of woodlands and trees and their place in the wider environment, leading to respect, responsible behaviour and positive attitudes towards the environment as a whole and a sustainable future.* The FCS (2009) strategy explicitly aims to focus education and learning on the environment and in particular to *show how woods and forests can contribute to combating climate change.*
- Developing the role of Forest School and encouraging increased informal learning activity through play. FCS (2009) explicitly supports the Forest School approach, stating that it aims to, *increase the number of Forest Schools and Forest Kindergartens.*
- The potential for increased engagement with volunteers and the development of transferable skills and educational attainment. FCE (2009), for example, includes, *woodlands will be used as a setting for people to develop their skills for everyday life such as literacy and numeracy, co-operation and communication* as a specific learning outcome of their education strategy.
- The potential to positively impact on wider outcomes. The FCS (2009) strategy describes the ways in which E&L can contribute to diverse factors such as health, recreation, economic and community development.

Appendix 4. Examples of tree, wood and forest education and learning providers

The Forestry Commission is one of a number of diverse organisations which deliver, support or facilitate TWF E&L in the UK; details of the range of organisations identified during the desk based review can be found in table 7 (the list is meant to illustrate the range of organisation involved and is not exhaustive).

Table 7. Examples of TWF E&L providers in the UK

Organisation providing TWF related E&L	Country	TWF E&L provision
AFT - Abriachan Forest Trust	Scotland	Provides forest school and other learning opportunities
Arc - Archimedes	England	Company which provides training for Forest School providers
BFT - Borders Forest Trust	Scotland	Borders Forest Trust delivers a range of innovative educational projects aimed at raising awareness of woodland heritage and the natural environment. The Borders Forest Trust leads educational visits to woodlands for local schools, youth groups and community organisations and has developed a Forest School programme in the region.
BTCV - British Trust For Conservation Volunteers	UK	BTCV offer a range of E&L, these tend to be more formal skills acquisition focused programmes aimed at adults. Some TWF focused projects.
CFEE - Countryside foundation for education	England and Wales	The aims of the Countryside Foundation for Education is to educate, inform and inspire children, parents and teachers, so that they can enjoy and appreciate the countryside while having a greater understanding of the wide range of issues surrounding it. The foundation facilitates and supports outdoor E&L.
CSFT - Central Scotland Forest Trust	Scotland	Provides and support range of education and learning opportunities
FACE - Farming and countryside education	England and Wales	Learning about food and farming in a sustainable countryside: Predominantly focused on farming and 'countryside' focused but may have links to woods and forests related learning
FC - Forestry Commission England, Scotland and Wales	GB-devolved	The Forestry Commission's responsibilities span research, commercial timber production, sustainability programmes and policy, as well as learning. Provides, facilitates and supports a range of different TWF E&L.
FEI - Forest Education Initiative	GB devolved	Forest Education Initiative (FEI) aims to increase the understanding and appreciation, particularly among young people, of the environmental, social, and economic potential of trees, woodlands and forests and of the link between the tree and everyday wood products.

FSC - Field Studies Council	UK	The FSC offers a broad range of formal education and learning, focuses predominantly on residential opportunities, particularly for deprived children.
GFL - Grounds for Learning (Scotland) and Learning Through Landscapes is the rest of the of the UK	UK	Grounds for Learning, part of the UK charity Learning through Landscapes, helps schools and early years settings make the most of their outdoor spaces for play and learning.
GLT - Green Light Trust	England	Delivers supports and facilitates a range of outdoor E&L, much of which is related to TWF. Programmes include 'Forests for our children'.
GW - Ground Work	England and Wales	Ground Work focuses on environmental regeneration but has many E&L e.g. it states that it works to 'creating opportunities for people to learn new skills and become more active citizens' and 'education - supporting sustainable schools and delivering learning and citizenship in and out of the classroom'
NF – National Forests	England	E&L opportunities and activities are provided within the eight National Forests
NMT - Northmore Trust	England	The Northmore Trust is based in South Oxfordshire and manages an estate of 300 hectares, including Little Wittenham Nature Reserve and Wittenham Clumps, a conservation farm, a woodland dedicated to forestry research and Project Timescape, the Trust's visitor centre. The Trust provides a range of educational opportunities.
NT - National Trust and NTS – National Trust Scotland	(NT) England, Wales and Northern Ireland (NTS) Scotland	The NT/NTS offer a range formal and informal educational opportunities for adults and children.
RSFS- Royal Scottish Forestry Society and RFS – Royal Forestry Society	UK	To encourage liaison between all aspects of forestry and other land uses; supports TWF E&L provision. RFS employs a dedicated education specialist
RSPB – Royal Society for the Protection of Birds	UK	Delivers a range outdoor E&L opportunities; some of which are related to TWF.

SF - Sylva Foundation	UK	The Sylva Foundation works to reconnect people with trees and woodlands, and with growing trees for wood; they therefore have a focus on TWF E&L. they argue that 'working with Early Years children is likely to have the greatest impact, with a view to achieving greater understanding of trees and woodlands in future generations'. The foundation delivers and supports various TWF E&L
SNH - Scottish Natural Heritage	Scotland	Has a team of educators and runs a programme of E&L, some of which is related to TWF.
SWFT - Southwest Forest Trust	England	The Trust provides Forest School and other TWF E&L opportunities
SY - Sylvanus	England	The trust is an active member of the Devon FEI cluster group and supports outdoor learning opportunities such as Forest School
TTC - The Tree Council	UK	Facilitates and supports TWF E&L
TTF - Timber Trade Federation	UK	Promotes careers within the forestry industry.
Wd T -Woodland Trust	UK	The Woodland Trust has a wide variety of educational programmes, projects and strategies; these include tree planting and formal education provision.
WT - Wildlife Trusts	UK (47 trusts)	Provides and supports outdoor and TWF E&L; for instance delivers Forest School on a number of its reserves. The Wildlife Trusts believe that people from all sections of society should have access to wildlife and the natural world for enjoyment, learning and contemplation.

Appendix 5. Examples of tree, wood and forest education and learning initiatives

In the following section we provide details of a number of examples of TWF E&L initiatives that illustrate the range of types in Britain. We have also included several international examples. Examples were selected to illustrate the range of use, types (TWF as a context or as a resource or focus) and forms (formal, informal and non-formal) of E&L.

Examples of Forestry Commission tree, wood and forest education and learning

Forest School

By far the most prevalent and recognised woodland education initiative in Britain must be that of Forest School. British Forest Schools which have been used since the mid-1990s developed in Scandinavia. Within the Forestry Commission Forest School is delivered both directly by FC staff and by other trained and qualified leaders (from NGOs, FEI clusters, schools and others) (O'Brien 2009). Forest School is a process that offers children, young people and occasionally adults, regular opportunities to achieve, and develop confidence and self-esteem through hands on learning experiences in a local woodland environment. While open to all age groups, Forest School is currently primarily focused on 3-7 year olds. Participants attend a Forest School once a week or fortnight for a half or whole day session typically for 6-12 weeks or more. Learning is linked to the national curriculums or foundation phase objectives and can cover a wide range of subjects such as art, environmental studies, history and maths (i.e. through number trails or learning to calculate tree height). The personal and social education aspects of the curriculum are also important.

For more information on Forest School see www.foresteducation.org/forestschools.php

Forest Kindergarten, Scotland

As with Forest School, Forest Kindergartens have their roots in Scandinavia where they have been established for over 25 years (where they are known as Nature Kindergartens – see international examples section) (Robertson, et al. 2009). In recent years Forest Kindergartens have been developed for use with young children in the Scottish context. While Scandinavian participants spend the majority of their time in the outdoors, regardless of the weather or season, Scottish children typically attend once a week or fortnight (though there are examples where children spend around 80% of their time in the outdoors). The aims of the Scottish Forest Kindergartens are to give young children the opportunities to play and explore in woodlands environments which it is hoped will be good for their health and wellbeing and will help develop a range of social, psychological and behavioural skills.

Certain Scottish Forest Kindergartens are supported by FCS, which help fund a full time dedicated Forest Kindergarten Officer for one year.

For more information see www.forestry.gov.uk/forestry/inf-d-7sqjg5

The Tree Trunk

FCS, and partners, have developed an online resource for teachers and communities that links trees and woodland to the national curriculum in Scotland. The Tree Trunk pilot project was started in 1996. Initially 24 'trunks', packed with carefully selected books, posters, videos, sound tapes and leaflets, were promoted to, and made accessible for, schools and community groups in four regions of Scotland. A handbook gave information on each item and on how it could be used. There were also links to the Scottish curriculum, advice on how to use the materials, a listing of useful organisations, a bibliography and a glossary, as well as a guide to setting up a community woodland.

The resource is now purely virtual (the use of the actual trunks was phased out); Tree Trunk online provides downloadable resources, including sample lesson plans, resource packs and information booklets. Most of these are free of charge. Teachers and schools are able to build up their experience and resources into their own 'Tree Trunk' that they can use as a source of knowledge and ideas. The ultimate aim is that the people of Scotland should act together to conserve and enhance the environment. The resources are currently under revision to meet the needs of the 'Curriculum for Excellence' and to ensure they are suitable for potential inclusion on the LTS website.

For more information see www.forestry.gov.uk/forestry/HCOU-4X2JGZ

Examples of tree, wood and forest education and learning initiatives from other organisations in Great Britain

WICKED - Tircoed

Tircoed developed a range of woodland initiatives for disadvantaged communities in rural Wales (FCW is a partner in the project). The WICKED (Woodland Initiatives – a Catalyst for Kids' Education and Development) project helps young people learn new skills through hands on workshops and activities. WICKED runs three disparate TWF initiatives targeting specific groups of young people:

- Acorn: a respite activity project for young carers including woodworking, community construction, arts in the woods and survival skills
- Tree Wise: woodland based support projects providing accredited wider curricular training for 14-16 year olds who have not succeeded in formal school settings.
- Working your Woods: work based training for young people aged 16-19 who are not currently in education, employment or training. A programme of taster sessions is provided including woodland management, construction, green woodworking skills and manufacturing. Opportunities to access further accredited training, work experience and/or volunteering are provided.

For more information see www.tircoed.org.uk

Nature Detectives - Woodland Trust

The Woodland Trust's online 'nature detectives' resource is aimed at schools, families, youth groups and others, with different sections of the site relevant for each. The section designed for schools provides teachers with a comprehensive resource linked to the national curriculum, with separate resources for England, Scotland and Wales where the curriculum diverges. Each age group is catered for.

Downloadable, woodland related, resources include worksheets for children to use outdoors. While for teachers the pages contain lesson planning material, project ideas and plans, links and work packages relating to climate change and a woodland related school assembly plan. Schools can work towards a Green Tree Schools Award and can qualify for free trees for the children to plant and look after.

For more information see www.naturedetectives.org.uk

Capital Woodlands - Trees for Cities

The Capital Woodlands Project aims to raise appreciation of London's woodlands and increase public benefit and participation by undertaking access, biodiversity, community and training work both in six 'flagship' woodlands and throughout the capital.

Key areas of work are the dissemination of good practice in the management of London's woodlands, training in woodland management skills, strengthening links between woodlands and communities, supporting the educational use of woodlands in London, and the support and recruitment of woodland conservation volunteers.

Capital Woodlands offers a range of training opportunities, from short, informal courses to vocational training in woodland management. The project also offers the opportunity for Londoners in long-term unemployment to re-train in woodland management, with potential benefits to career prospects

For more information see www.capitalwoodlands.org

International examples of tree, wood and forest education and learning initiatives

A Forest for Every Classroom, Vermont

A Forest for Every Classroom (FFEC) recruits teachers - first from communities that are adjacent to the National Forest and National Park and then from the wider state of Vermont - to participate in an 11-day program. During the workshops, teachers spend 60 percent of their time in federal, state or community forests, learning about canopy, tree identification, bird and frog songs, forest floor composters, wildlife habitat, amphibians, and about cultural sites such as stone walls and cellar holes. They learn about logging, milling, forest products and land use and land management challenges. Teachers take what they learn about forests - ecological, economic or cultural - and create their own curriculum with the help of state experts in innovative curriculum development.

FFEC's partnership of public and private organisations is a model for how collaboration can increase the effectiveness of organisations to serve communities, enhance educational outreach, and protect public lands.

For more information see www.peecworks.org/PEEC/PEEC_Reports/I00043ABA

Forest / Nature Kindergartens, Denmark

Forest or Nature Kindergartens are found across Denmark depending on interest and initiatives from local government, institutions, parents, the local State Forest District and private forest owners. Interest is growing and there are now more than 500 institutions (examples are found in each of Denmark's municipalities) which are defined as forest kindergartens. The children attending Forest / Nature Kindergartens usually spend the whole day, throughout the year, in natural settings. Some kindergartens are situated within a forest, while others use transportation, e.g. buses or trains, to reach the natural area. Typical Forest / Nature Kindergarten practices vary from day-to-day and from institution-to-institution.

Reproduced from (O'Brien, et al. 2010).

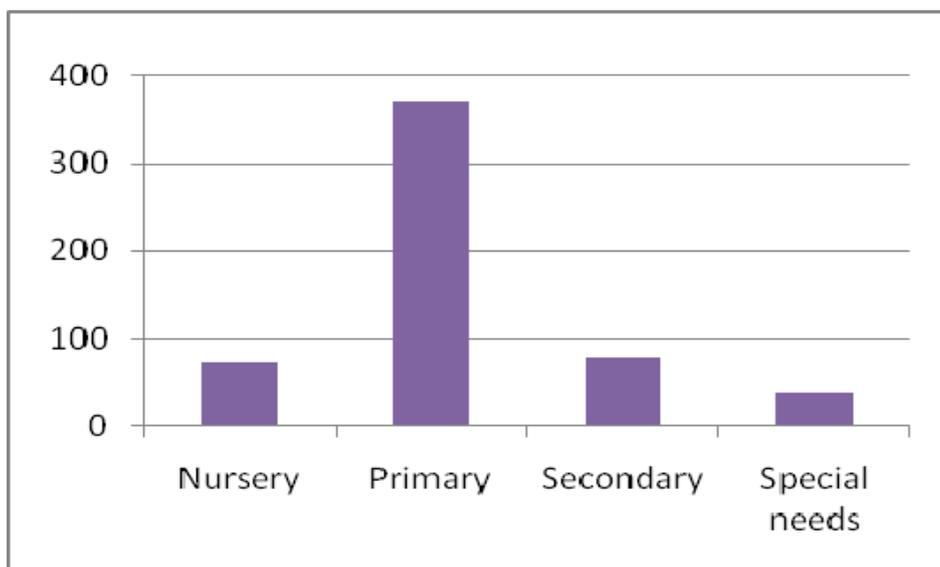
Appendix 6. Forestry Commission tree, wood and forest education and learning projects and programmes

Across the three countries the FC currently delivers, or facilitates the delivery of, a wide range of formal and informal educational and learning opportunities; examples range from the provision of programmes of formal education by trained educational specialists, to modern apprenticeships for school leavers and to the provision of interpretation boards for visitors to woodlands. Table 2 in section 1.2 details the various ways in which the Forestry Commission delivers or facilitates TWF E&L.

According to the FCE education strategy (Forestry Commission England 2009) around 170,000 people participate in FCE E&L activities per annum. In Scotland the recent F4P study (Edwards, et al. 2008b) found that of the 1,517 reported annual FCS public events, 325 were 'formal education' and 239 'informal learning'. The authors also tentatively estimated the numbers participating in these events, suggesting that 42,245 individuals attended formal educational events and 16,365 attended the informal events (pages 62-64). The authors also estimated the total number of school trips made to woods and forests in the previous year; they suggested that approximately 510,000 individual school trips (some children made repeated visits) were made to woods and forests. Up to 20,000 Welsh children participate in formal education, delivered by FCW, each year (Forestry Commission Wales 2004).

As the above indicates the more formal Forestry Commission E&L is predominantly aimed at primary aged children; for instance 65% of the participants of FCE's E&L activities were under 11 years of age (Forestry Commission England 2009) and as Figure 1 illustrates in 2005/6 two thirds of the school trips made to FCS education facilities and activities were made by primary aged children (O'Brien 2006). The vast majority of visits (by visitor count) are led on-site by Forestry Commission staff (Harrop and Groves 2006).

Figure 1. Annual number of school trips made to FCS forests (O'Brien 2006)



FCE invests around £1.4 million a year on E&L, in 2004 FCS invested £415 thousand on E&L and in Wales FCW invests around £640 thousand per year on its delivery of E&L.

Projects

A review of FC TWF E&L identified over 60 recent and current projects, programmes and initiatives (this does not include the programmes of formal direct education provision offered at key sites such as Alice Holt²⁰), details can be found in Table 8.

Table 8. TWF E&L projects and programmes delivered by or in partnership with the Forestry Commission

Project / Programme name	District / conservancy / region	Aim / objectives of project
Access and interpretation of Newmillerdam Arboretum	Yorkshire & the Humber	To create a variety of resources to assist blind and partially sighted access and interpretation to the restoration of a 200 ha arboretum in public woodlands.
Active England Great Western Community Forest	South east England	To increase community participation in sport and physical activity. Using walking and cycling paths, bus service, green gym, outreach work at Whitworth Parks, inspirational events. Development officer at for family based learning - employed thru Swindon
Active England 'Park Life' Greenwood Community Forest	East Midlands	To raise awareness and encourage people to use their local green space for healthy exercise. Traditional activities such as walking, cycling but also mini beast trails, team building activities, 'Scavenger Art', shelter building, Nordic walking, 'Tri golf
Alice Holt Education Programme	South east England district	To provide range of educational programmes for school visits, teacher CPD and student teacher training.
Am Bata	Scotland	Pupils involved with the school's 'Am Bata' boat building project recently worked with Forestry Commission Scotland ranger, Stuart Findlay, to make sure that future generations could in turn keep the boat building skills alive. People taking part in the course learn the traditional skills that allow them to build clinkerbuilt sailing boats
Ashton Hill Wood Project	Forest of Dean district	To provide programme of outdoor learning opportunities for young people with special needs. Building timber framed outdoor classroom. Many of the children involved had behaviour and/or learning difficulties. Some were excluded from school and part of youth
Blean Woods Project	South east England district	To raise awareness of the natural and cultural heritage of Blean.
Bourne Wood sculpture trail	Northamptonshire district	Resident artists, community and education activities, exhibitions and special programme of events.

²⁰ www.forestry.gov.uk/aliceholt-learning

Branching Out West Lothian	West Lothian	To inspire a new audience to learn about the importance of woodland, to enthuse people to regularly go into their woods, to enable people to enjoy their local woods for the biodiversity, health and recreational benefits which they provide, and to protect
Building skills and confidence through volunteering	South West	To improve the ability of adults with special needs to develop their social skills, esteem and confidence through engaging in volunteering, with the aim of helping them to seek longer term employment.
Cannock Chase Cycling Project	West Midlands district	Purpose built cycle trails for different types of cycling; to draw people into forest; to encourage community ownership
Children's Fun Day in the Forest	South east England	To run a Forest Fun Day for groups of children with learning difficulties/disabilities from local special needs schools.
Chiltern Sculpture Trail	South east England district	To provide unique environment in which to enjoy and experience contemporary sculptures that reflect, compliment and challenge their natural setting.
Climate change interpretation at Westonbirt	South West England	To increase awareness of climate change through seasonal trail - interpretation stops
Creech Wood Access	South east England	To increase recreational value by improving footpaths; to encourage biodiversity; circular loop to allow more visitors, more organised group/educational activities; to install children's play area
CSI - Brodsworth	South Yorkshire	To provide way marked trails to increase use and widen user groups; arts project; educational facility for environmental education
CSI - Cudworth Common	South Yorkshire	To encourage wider visitor audience; enhance education opportunities through pond dipping platform and sensory garden; community arts project to improve areas suffering from unsociable activities & vandalism.
Dartmoor Rehabilitation Programme	South West England	To provide work experience and training for prisoners nearing release.
Educational tour of area	Scotland	A walk through the landscape – and boat trips to some abandoned settlements – will reveal how people used to live back in the days when the Glen's thriving network of communities was home to around 4000 people.
		The tour - led by Hector Rodgers (Glengarry Heritage Centre) and Ruari Watt (Forestry Commission Scotland) - will also offer an insight into why 90% of those people left – as well as the effect that their leaving had on the Glen.
Ellen Tinkham School Project	South West	To assist students with severe learning disabilities through carrying out recreation/conservation tasks.
Environmental Education Project	East Midlands	To develop knowledge, understanding, respect for and involvement in the National Forest and the environment through enjoyable learning opportunities. Provides environmental education services, to provide activities & events
FEI & Forest Schools	England	To encourage first hand learning opportunities; increase environmental understanding; promoting wood as a sustainable resource; developing emotional & physical well-being

Forest Apprenticeships	England	The course includes six-months of part-time tuition at Sparsholt College, near Winchester, which will give an NVQII qualification in forestry and spend four months gaining practical experience with the National Trust
Forest Kindergarten	Central Scotland Conservancy	At pilot stage with view to scale up. Aim is to get the early years sector to take their children outdoors more often to allow the children to learn through play in natural settings. Increase awareness of the natural resource available for outdoor education.
Forest of Avon Wood School Project	Forest of Dean district	To enable schools and communities to access, learn about and celebrate their local woodland heritage through developing programmes with schools to use woods as ongoing learning resource; to provide forest education training and providing resources for teachers.
Forest School in Wales: A New Approach for Outdoor Learning (DVD)	Wales	Provide a training resource. Produced in Welsh and English, the DVD shows a range of Forest School settings and Forest School learners across Wales, including an urban nursery in Cardiff, primary schools working in woodlands in Newport, Carmarthen, Wrexham and Powys, 14 -16-year-olds from Merthyr Tydfil on a learning pathway project, pmlD students using an all-abilities sensory trail, and Level 1 training for parents and community workers in Markham, Caerphilly
Forest School training and apprenticeships	Wales	Teacher training in FC woods by FC staff.
Forest Schools	UK	Sustained programme of education in woods or forests for children of any age.
Forest Tots	West Midlands district	To provide a club for pre-school children and their carers which enhances a child's awareness of the sights and sounds of the outdoors.
Forestry Volunteering	Scotland (UK?)	Learning and skills acquisition through volunteering with the FC
Get Active in the Forest	West Midlands district	Establish centre as physical activity centre; also provides training & education.
Glasgow Forest School Programme and	Central Scotland Conservancy	To promote and develop Forest Schools within Glasgow City Council and Edinburgh. Provide training to interested parties in order to grow the provision of Forest Schools within the cities
Glasgow Forest Schools programme - teacher training	Scotland	Outdoor education in Glasgow got another boost recently when 16 professionals got to grips with loppers, saws and an outdoor classroom as they worked towards becoming qualified Forest School leaders. The latest Leader trainees - including teachers, a police officer, countryside rangers and Commission staff - developed their practical woodcraft skills, gained an understanding of woodland management and also learned how Forest Schools work
Go Mountain Bike	Central Scotland Conservancy	To further develop mountain biking whilst also giving it a recognised learning scheme to follow and allow pupils to progress through with identified outcomes

International Arts at Fermyn Wood	East England	To create new arts venue; community arts learning centre for 500 students pa; 2 miles of wheelchair/pushchair friendly trails; 6 miles new family-friendly cycle route
Junior Rangers	England	Children aged 8 to 12 years can see what it takes to become a forest ranger and learn more about our wonderful woodlands and the creatures that live in them.
Lancashire Woodlands Project	North West England	To encourage sustainable management of county's woodlands; to support development of local timber use & timber products; deliver woodland outreach programme to all sectors of community (including children's activities), promote cooperation between all sectors
Modern apprenticeship scheme in the forestry sector	Scotland	There are 30 apprentices – including 8 women – enrolled on the scheme across 7 of the Commission's forest districts. Using the Modern Apprenticeship framework, apprentices serve two years in either forest establishment or machine operating.
		The training is a mix of formal training, practical work experience, on-the-job training and study towards an SVQ Level 3 qualification
National Biodiversity Week events	Wales	Helping children to discover and learn about the amazing diversity of life that vibrant Welsh woodlands harbour
Neroche Scheme	South West District	To invest in natural, built & cultural heritage of area; to make landscape more accessible to everyone; to improve people's ability to sustain the qualities of the landscape. Scheme comprises 23 projects, under 8 programmes: natural heritage, built & arc
New Forest Apprenticeship Scheme	South east England	To raise skill level in local community for range of land management skills related to the New Forest
OneOak Project	South east England	to help promote the importance of trees and woodland management and the benefits of using wood. One 160 yr old oak tree will be felled in early 2010 watched by 300 school children and supporters. The project will follow the stories of the tree/wood as it is cut down and used.
Outwood Future Landscape Project	Wakefield, West Yorkshire	To create an understanding of the cultural relevance of the local forest; to celebrate distinctiveness of present shaped by past; tree planting
Overlooking the Wye	West Midlands district	To improve access and interpretation to viewpoints and heritage of the Wye Valley
Route to Health Sculpture Trail	West Midlands district	To enable people to access health information through sculptures themed around health issues and to experience the benefits of the outdoors. Artworks created by local artists and community groups, including young people at risk of social exclusion, adult
Sculpture trail	Wales	FC Wales, which looks after Fforest Fawr for the Assembly, has been working to extend learning opportunities for schools who have used the existing all-abilities path to help educate pupils in a stimulating environment away from the classroom for a number of years

Seeds for Schools	UK	Children will learn about climate change through planting tree seeds and the use of specially produced teaching materials
SFCR Landscape & Access Project / Sherwood Initiative	East Midlands	To involve local people in enhancement of local countryside sites adjacent to coalfield communities; to use local volunteers; to raise awareness through guided walks & events.
Sherwood Forest Community Ranger Project	East Midlands	Community involvement on former pit tip sites and other greenspace adjacent to former Notts coalfield communities
Stour Valley Arts	South east England district	To promote a greater interest in the countryside and increase public awareness and enjoyment of environmental art through the work of artists in residence and international exchanges. To offer an artist led educational programme for students of all ages
Teacher Training	Wales	A new training programme which is giving teachers the confidence to let them learn new life skills in safety. The ground-breaking sessions run by Forestry Commission Wales and Bridgend Foundation Phase team to deliver the outdoor learning module have provided almost 120 teachers in the last month with the ability to deliver life-changing education programmes
The Meaning of Trees	West Midlands district	Primary schools were invited to enter a competition to create a collage based on what trees mean to them as part of National Tree Week 2007. Winners were taken on trip to Chasewater Innovation Centre and took part in willow weaving, environmental quiz.
Traditional Carpentry	England	The Forestry Commission received funding from the Herefordshire Rivers programme to hold a course in traditional carpentry skills for local people wanting to learn new or develop existing skills: using the building project to tutor local people of all ages and abilities in traditional timber framing, with a mix of beginners and experienced people enjoying the series of three-week courses
West Somerset Mineral Line	South West England	To restore and interpret historical site; provide all-ability and general recreational access at Chargot Woods; restore Chargot Chimney SAM; provide educational opportunities.
Wild Ennerdale partnership	North West England	To allow the evolution of Ennerdale as a wild valley for the benefit of people relying more on natural processes to shape its landscape and ecology. Involving people through events and activities such as guided walks, canoeing, outdoor art. Involving young people in educational activities.
Wildlife in the Woods at Lydford	South West	To work with a variety of local disability organisations to introduce their clients to the outdoor natural environment

Woodlands for learning conferences	Wales	The Woodlands for Learning Conferences are held annually as part of FC Wales's aim to celebrate and raise awareness of the wide range of Welsh woodland education programmes and facilities available throughout Wales. This conferences raise children's awareness of the natural qualities of wood and also open their eyes to the possibilities for making a career from working with this most sustainable product.
Woodlands In and Around Towns (WIAT)	Scotland	Improve quality of place (build physical capital) and help community participation (building social capital): 1. create new woodland 2. bring neglected woodland into active management 3. work with people to help them use their local woodland.
Working with children with disabilities	South West	To bring children with sight disabilities together through a one-day event of cycling and bush craft skills.
Working with deaf students	South West	To assist new students to integrate into existing class groups at the Royal College for the Deaf, Exeter through short sensory walks.
Wye Wood Project	West Midlands district	To link organisations to make the most of local resources & skills; to work with hard-to-reach individuals including unemployed, ex-offenders, ethnic minorities, disabled, people with no access to countryside; to provide access to training; to increase awareness

Appendix 7: Results of the literature review

Reports and organisational evaluations

- Anderson, T. and Metcalf, H.** 2003 'Modern apprenticeship employers: Evaluation Study': National Institute of Economics and Social Research
- Anon** 2001a 'Greening School Grounds: Creating Habitats for Learning'.
 — 2001b 'Growing a Forest for the Trees' *Growing Ideas*.
 — 2007 'Conservation Education: Strategic Plan To Advance Environmental Literacy. 2007-2012. FS-879': US Department of Agriculture.
- Bell, S., Hamilton, V., Montarzino, A., Rothnie, H., Travlou, P. and Alves, S.** 2008 'Greenspace and quality of life: a critical literature review', Edinburgh
 OPENSspace/greenspace scotland.
- Borradaile, L.** 2006 'Forest School Scotland: An Evaluation', Edinburgh: Forestry Commission Scotland
- British Trust for Conservation Volunteers** Accessed January 2008 'Green Gym Research Summary', http://www2.btcv.org.uk/gg_summary.pdf.
- BTCV** 2004 'Wellbeing comes naturally... Evaluation of the Portslade Green Gym': BTCV.
- Carter, C.** 2008 'Offenders in nature: policy into practice', Farnham: Forest Research
- Davis, B. and Waite, S.** 2005 'Forest School: Opportunities and Challenges in Early Years ', University of Plymouth.
- Dietrich, K., Jacobsen, C., Mygind, E. and Stelter, R.** accessed Sept 2009 'A weekly nature day in a Danish 'Folkeskole': An educational setting'.
- Dillon, J., Morris, M., O'Donnell, L., Reid, A., Rickinson, M. and Scott, W.** 2005 'Engaging and learning with the outdoors - the final report of the outdoor classroom in a rural context action research project': National Foundation for Educational Research.
- Eastwood, G. and Mitchell, H.** 2003 'An evaluation of the first three years of the Oxfordshire Forest School project', Oxford: Oxfordshire County Council.
- Edwards, D., O'Brien, L., Sarajevs, V. and Valatin, G.** 2008 'A valuation of the social and economic contribution of forestry for people in Scotland', Farnham: Forest Research
- Enloe, C.** 2002 'Trees that ease learning', Washington: American Forests.
- Harris, F.** undated 'Perspectives on educational visits to farms: a report on research with farmers, teachers, children and parents', Kingston upon Thames: Kingston University
- House of Commons Education and Skills Committee** 2005 'Education outside the classroom ', London: The Stationary Office.
- Innes, L.** 1992 'Do Trees Seem Different When One Is in the Forest? Wilderness Experience and Respect for Nature' *Pathways The Ontario Journal Of Outdoor Education*.
- Kenny, R.** 2009 'Involve, Enjoy, Achieve: Forest School evaluation project', <http://www.forestofavon.org.uk/sites/default/files/Forest%20School%20Evaluation%20Project.pdf> Accessed May 2009: Forest of Avon.
- Knight, S.** undated 'Can Forest School act as a spur to better quality outdoor experiences?', Norwich: Anglia Ruskin University.
- Lantra** 2004 'Apprenticeship for trees and timber in England and Wales', Coventry: Lantra.
- Lovell, R.** 2009 'Physical activity at Forest School ' *Access and Health* Edinburgh Forestry Commission Scotland.

- LTS 2007 'Taking Learning Outdoors: partnerships for excellence', Edinburgh Learning Teaching Scotland.
- Mannion, G., Sankey, K., Doyle, L. and Mattu, L.** 2006 'Young people's interaction with natural heritage through outdoor learning', Stirling: University of Stirling.
- Massey, S.** 2005 'The benefits of Forest School experience for children in their Early Years': Worcestershire LEA.
- Maynard, T.** 2003 'Forest School Swansea Port Talbot: An Evaluation', University of Wales Swansea: Unpublished.
- McDougall, S., Fisher, S. and Fisher, Z.** 2003 'An examination of children's expressive skills, self esteem & enjoyment of school in the context of the Forest School experience', in T. Maynard (ed) *Forest School Swansea Neath Port Talbot: An Evaluation*, University of Wales Swansea.
- Mitchell, R. and Shaw, R.** undated 'Health impacts of the John Muir Award' University of Glasgow, John Muir Trust, Glasgow Centre for Population Health.
- Muir, T. and West, V.** 2002 'Schools education service survey 2002', Edinburgh Forestry Commission Wales.
- Murray, R.** 2004 'Forest Schools project evaluation: A study in Wales ', London: New Economics Foundation.
- Murray, R. and O'Brien, E.** 2005 "'Such Enthusiasm - A Joy to See" An Evaluation of Forest School in England': Forest Research.
- Nicol, R., Higgins, P., Ross, H. and Mannion, G.** 2007 'Outdoor Education in Scotland: A Summary of Recent Research', Perth: Outdoor Connections, SNH, LTS.
- O'Brien, E. A.** 2006 'Survey of formal education (3-18) undertaken and delivered by Forestry Commission Scotland', Farnham Forest Research
- O'Brien, L.** 2008 'Environmental volunteering: motivations, benefits and barriers' *Research summary* Farnham Surrey.
- O'Brien, L. and Murray, R.** 2006 'A marvellous opportunity for children to learn: A participatory evaluation of forest school in England and Wales', Farnham: Forest Research.
- O'Donnel, L., Morris, M. and Wilson, R.** 2006 'Education outside the Classroom: An assessment of activity and practice in schools and Local Authorities' NFER. London
- OFSTED** 2004 'Outdoor Education - Aspects of good practice', London: Department for Education and Skills.
- OFSTED** 2008 'Learning outside the classroom: How far should you go?' London
- Pavey, B. E.** 2006 'The Forest School and inclusion: a project evaluation'.
- Powers, A. L.** 2003 'An Evaluation of A Forest for Every Classroom: Learning to make choices for the future of Vermont's forests', Vermont: Shelburne Farms, The Marsh-Billings-Rockefeller National Historical Park, The Conservation Study Institute, The Northeast Natural Resource Centre of the National Wildlife Federation, The United States Forest Service and the Place-based Education Evaluation Collaborative.
- Rickinson, M., Dillon, J., Teamey, K., Morris, M., Young Choi, M., Sanders, D. and Benefield, P.** 2004 'A review of research on outdoor learning', London: National Foundation for Educational Research and King's College London.
- Robb, D.** 2006 'A Walk in the Woods' *Teacher Magazine*.
- Robertson, J., Martin, P., Borradaile, L. and Aiker, S.** 2009 'Forest Kindergarten feasibility study', Glasgow GCV Green Network : Forestry Commission Scotland.
- Roe, J.** 2009 'Forest School and restorative health benefits in young people with varying emotional health' *Access and Health* Edinburgh Forestry Commission Scotland.

Solin, J. undated 'Education for Sustainability: Wisconsin School Forests' Role in Creating Sustainable Communities through Education', Stevens Point, Wisconsin: Wisconsin Centre for Environmental Education, College of Natural Resources. University of Wisconsin-Stevens Point.

Spencer, M. and Smith, K. K. 2002 'Linking with Community To Reclaim Natural Areas for Education: The Mc Lane Elementary School Project' *Clearing*.

Tanner, C. K. 2001 'Into the Woods, Wetlands, and Prairies' *Educational Leadership*.

Trimble, S. 1995 'The Scripture of Maps, the Names of Trees' *Taproot*.

Wilkinson, S. 2007 'Westonbirt interpretation survey 2007': Forestry Commission England

— 2008 'A scoping report examining the Forestry Commission niche in communicating climate change in England, and recommendations for further work', Westonbirt Forestry Commission England.

Willis, K. G., Garrod, G., Scarpa, R., Powe, N., Lovett, A., Bateman, I. J., Hanley, N. and Macmillan, D. C. 2003 'The Social and Environmental Benefits of Forests in Great Britain', Newcastle: The University of Newcastle.

Wilson, M. 2005-6 'Schools education service survey 2005/6', Edinburgh Forestry Commission Wales.

Conference proceedings

Ball, M. 2001 'Wilderness Survival and Outdoor Education' Daring To Be Different! Proceedings of the Annual International Conference on Outdoor Recreation and Education.

Higgins, P. 2000 'Learning outdoors: Encounters with complexity' *Other ways of learning*, Marburg, Germany: European Institute for Outdoor Adventure Education and Experiential Learning

Kylin, M. 1999 'Making Outdoor Places for Children: How Children's Needs for Outdoor Places Are Reflected in Community Plans. A Pilot Study' *Communication in Urban Planning Conference*.

O'Brien, E. and Claridge, J. 2002 'Trees are Company: Social Science Research into Woodlands and the Natural Environment', in E. O'Brien and J. Claridge (eds) *Forestry Research Co-Ordination Committee Conference*, Glamorgan Building, Cardiff University, Cardiff: Forestry Commission.

Waite, S. J. 2007 'Finding a way: creativity and performativity in the open field of outdoor learning' *British Educational Research Association Annual Conference*.

Waite, S. J. and Rea, T. 2006 'Pedagogy or place?: attributed contributions of outdoor learning to creative teaching and learning' *British Educational Research Association Annual Conference*.

Williams, S. J. 2005 'The competent child: developing children's skills and confidence using the outdoor environment: a Danish perspective' *British Educational Research Association Annual Conference*.

Academic papers and reports

Abe, M., Yoshimura, T., Yasukawa, N., Koba, K., Moriya, T., K. and Sakai, T. 2004 'Development and evaluation of a support system for forest education', *Journal of Forest Research* 10(1): 43-50.

- Almeida, S., Bombaugh, R. and Mal, T. K.** 2006 'Involving School Children in the Establishment of a Long-Term Plant Biodiversity Study of an Urban Green Space', *American Biology Teacher*: 8-220.
- Barratt-Hacking, E., Hacking, R. and Scott, W.** 2007 'Engaging children: research issues around participation and environmental learning', *Environmental Education Research* 14(3): 529-544.
- Berenguer, J.** 2007 'The effect of empathy in proenvironmental attitudes and behaviors', *Environment and Behavior* 39(2): 269-283.
- Borge, A. I. H., Nordhagn, R. and Lie, K. K.** 2003 'Children in the environment: Forest day-care centres, modern day care with historical antecedents', *History of the Family* 8: 605-618.
- Brown, N.** 2003 'A critical review of Forestry Education ', *Education 3-13* 1(1).
- Davis, B., Rea, T. and Waite, S.** 2006 'The special nature of the outdoors: Its contribution to the education of children aged 3-11', *Australian Journal of Outdoor Education* 10(2): 3-12.
- Dillon, J., Rickinson, M., Teamey, K., Morris, M., Choi, M. Y., Sanders, D. and Benfield, P.** 2006 'The value of outdoor learning: evidence from research in the UK and elsewhere', *School Science Review* 87(320): 107-110.
- Donaldson, G., & Donaldson, L.** 1958 'Outdoor education: A definition.' *Journal of Physical Education, Recreation & Dance* 29(17): 27-63.
- Doyle, J.** 2006 'If you go down to the woods today', *Primary Geographer*(59): 17-19.
- Edwards, I. and Paul, H.** 1989 'In an urban jungle: studying rain forest life at the Royal Botanic Garden Edinburgh', *Environmental Education and Information* 8(3): 135-140.
- Elliott, M. A.** 1996 'A Kinship with Trees: Revisiting Some of Childhood's Friends', *Taproot*: 3-4.
- Faber Taylor, A. and Kuo, F. E.** 2008 'Children with Attention Deficits Concentrate Better After Walk in the Park', *Journal of Attention Disorders* August 25, 2008.
- 2009 'Children With Attention Deficits Concentrate Better After Walk in the Park', *J Atten Disord* 12(5): 402-409.
- Faber Taylor, A., Kuo, F. E. and Sullivan, W.** 2002 'Views of nature and self discipline: evidence from inner city children', *Journal of Environmental Psychology* 22: 49-63.
- Factor, J.** 2004 'Tree stumps, manhole covers and rubbish tins: The invisible play-lines of a primary school playground', *Childhood* 11(2): 142.
- Fjørtoft, I.** 2001 'The Natural Environment as a Playground for Children: The Impact of Outdoor Play Activities in Pre-Primary School Children', *Early Childhood Education Journal*: 111-17.
- Fjørtoft, I.** 2004 'Landscape as Playscape: The Effects of Natural Environments on Children's Play and Motor Development', *Children, Youth and Environments* 14(2): 21-44.
- Flogaitis, E. and Agelidou, E.** 2003 'Kindergarten teachers' conceptions about nature and the environment ', *Environmental Education Research* 9(4): 461-478.
- Grahn, P.** 1996 'Wild nature makes children healthy', *Journal of Swedish Building Research* 4: 16-18.
- Hattie, J. A., Marsh, H. W., Neill, J. T. and Richards, G. E.** 1997 'Adventure education and Outward Bound: Out-of-class experiences that make a lasting difference', *Review of Educational Research* 67(1): 43-87.

- Hope, G., Austin, R., Dismore, H., Hammond, S. and Whyte, T.** 2007 'Wild woods or urban jungle: playing it safe or freedom to roam', *Education 3-13* 35(4): 321-332.
- Lord, T.** 2008 'If You Go Down to the Woods Today', *Journal of College Science Teaching*: 4-93.
- Louv, R.** 2008 'National Conference on Outdoor Leadership. 2008 Keynote Address', *Journal of the Wilderness Education Association* 20(1): 3-6.
- Manzo, K. K.** 2008 'Schools Adapting Curriculum to the Outdoors', *Education Week* 28(15): 3.
- Maynard, T.** 2007a 'Encounters with Forest School and Foucault: a risky business?', *Education 3-13* 35(4): 379-391.
- 2007b 'Forest Schools in Great Britain: An initial exploration', *Contemporary Issues in Early Childhood* 8(4): 320-331.
- 2007c 'A Risky Business? Encounters with Forest School and Foucault', *Education 3-13* 35(4): 379-391.
- Meinhold, J. I. and Malkus, A. J.** 2005 'Adolescent environmental behaviors: can knowledge, attitudes and self-efficacy make a difference?', *Environment and Behavior* 37: 511-532.
- Merriman, E.** 2007 'Bringing forests to life: The Awyr Iach Project', *Early Years Educator* 9(2): 36-44.
- Milligan, C. and Bingley, A.** 2007 'Restorative places or scary spaces? The impact of woodland on the mental well-being of young adults', *Health and Place* 13(4): 799-811.
- Moore, R. C.** 1996 'Outdoor Settings for Playing and Learning: Designing School Grounds to Meet the Needs of the Whole Child and Whole Curriculum', *NAMTA Journal*: 97-120.
- Morrell, P. D.** 2003 'Cognitive Impact of a Grade School Field Trip', *Journal of Elementary Science Education* 15(1): 27-36.
- Mygind, E.** 2007 'A comparison between children's physical activity levels at school and learning in an outdoor environment', *Journal of Adventure Education and Outdoor Learning* 7(2): 161-176.
- O'Brien, E. A.** 2005 'Publics* and woodlands in England: well-being, local identity, social learning, conflict and management', *Forestry* 78(4): 321-336.
- O'Brien, L.** 2009 'Learning outdoors: the Forest School approach', *Education 3-13* 37(1): 45-60.
- O'Brien, L. and Murray, R.** 2007 'Forest School and its impacts on young children: Case studies in Britain', *Urban Forestry & Urban Greening* 6(4): 249-265.
- Peacock, A.** 2008 'If you go down to the woods today ...: developing a whole-school culture where it is safe to take risks', *Forum (for Promoting 3-19 Comprehensive Education)* 50(2): 219-223.
- Pretty, J., Griffin, M., Peacock, J., Hine, R., Sellins, M. and South, N.** 2005a 'A countryside for health and wellbeing: The physical and mental health benefits of green exercise', *Countryside Recreation* 13(1): 2-8.
- Pretty, J., Peacock, J., Sellens, M. and Griffin, M.** 2005b 'The mental and physical health outcomes of green exercise', *International Journal of Environmental Health Research* 15(5): 319-337.
- Resch, H.** 2008 'Considering changes in wood utilisation - a European perspective', *Maderas, Cienc. tecnol* 10(1): 61-68.
- Simmons, D.** 1998 'Using Natural Settings for Environmental Education: Perceived Benefits and Barriers', *Journal of Environmental Education* 29(3): 23-31.

- 1999 'Training and urban teachers willingness to teach environmental education', *Environmental Education and Information* 18: 29-38.
- Souter, H.** 2002 'Using the outdoor classroom', *Primary Science Review* 75: 27-29.
- Swarbrick, N., Eastwood, G. and Tutton, K.** 2004 'Self-esteem and successful interaction as part of the forest school project', *Support For Learning* 19(3): 142-146.
- Waller, T.** 2007 "'The Trampoline Tree and the Swamp Monster with 18 Heads": Outdoor Play in the Foundation Stage and Foundation Phase', *Education 3-13* 35(4): 15-407.
- Waters, J. and Begley, S.** 2007 'Supporting the development of risk-taking behaviours in the early years: an exploratory study', *Education 3-13* 35(4): 365-377.
- Woodhouse, J.** 1987 'Outdoor activities: establishing a life-long friendship', *Bulletin of Physical Education* 23(3): 9-13.

Theses and dissertations

- Carson, J.** 2007 'The ecology of school change: An Australian primary school's endeavour to integrate concept-based experiential environmental learning throughout core curriculum', United States, Arizona: The University of Arizona.
- Dietz, K. A.** 2002 'Influence of Teaching in an Outdoor Classroom on Kindergarten Children's Comprehension and Recall of a Science Lesson' *Curriculum and Instruction*, United States, Louisiana: Louisiana State University
- Hill, V. J.** 2005 'A case study of the Wedington Project: A description of a public park/interdisciplinary, learning/research laboratory through the perceptions of its stakeholders', United States, Arkansas: University of Arkansas.
- Knecht, S.** 2008 'Benefits and Challenges of Forest Education in Primary Schools in the Canton of Zurich, Switzerland ', Zurich: University of Zurich.
- Lewis, T., Jr.** 2009 'Youth and nature: Assessing the impact of an integrated wellness curriculum on nature based play and nature appreciation for youth in out-of-school time recreation programming', United States, Minnesota: University of Minnesota.
- Lovell, R.** 2009 'An evaluation of physical activity at Forest School ' *School of Clinical Sciences and Community Health*, United Kingdom, Edinburgh: The University of Edinburgh
- Proctor, J. M.** 2004 'Forest Service interpretation: A qualitative, multiple-unit, cost-effectiveness case study', United States, Colorado: University of Denver.
- Reeves, J. L.** 1993 'A qualitative study of Walk With Nature: An outdoor, environmental, experiential education program', United States, Georgia: University of Georgia.
- Shanely, S. D.** 2006 'Towards an understanding of an outdoor education program: Listening to participants' stories', United States, Florida: University of Florida.
- Wakild, E.** 2009 'University outdoor programs and their natural and social communities', United States, Arizona: Prescott College.
- Warpeha, J. R.** 1998 'Design and implementation of an outdoor forestry program for children with diabetes', United States, Maine: The University of Maine