Environment and Rural Affairs Monitoring & Modelling Programme (ERAMMP)

National Forest in Wales Evidence Review

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Forest Research

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Abbreviations Used in this Report

CABE	Commission for Architecture and the Built Environment
CIEEM	Chartered Institute of Ecology and Environmental Management
ERAMMP	Environmental Monitoring and Modelling Programme
FR	Forest Research
IPAQ	International Physical Activity Questionnaire
NEET	Not in employment, education or training
NICE	National Institute for Health and Care Excellence
NFV	National Forest Visits
NGO	Non-Governmental Organisation
NRW	Natural Resources Wales
PAL	Physical Activity Level
PATT	Plant a Tree Today
QALY	Quality Adjusted Life Years
RSPB	Royal Society for the Protection of Birds
SCV	Social and Cultural Values
UKCEH	UK Centre for Ecology & Hydrology
WEMWBS	Warwick Edinburgh Mental Well-being Scale
WIAT	Woodlands in and around towns
WaY	Woodlands and You
WG	Welsh Government

Abbreviations and some of the technical terms used in this report are expanded on in the programme glossaries:

https://erammp.wales/en/glossary (English) and https://erammp.cymru/geirfa (Welsh)

Contents

1 EXECUTIVE SUMMARY

1.1 INTRODUCTION

This report is Annex 8 of a review that was commissioned in 2020 by the Welsh Government (WG) from the Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP). The aim is to provide key evidence of potential benefits and disbenefits (and the trade-offs between them) of woodland creation, woodland expansion and managing undermanaged woodland, and thereby contribute to the evidence base to inform the development of a National Forest for Wales.

The ERAMMP National Forest Evidence Pack[1] that was subsequently produced and published in 2020 drew evidence from across the scientific community. Although generally accepted as being a comprehensive review of the available evidence on woodland in Wales, an appraisal of the evidence pack highlighted the need for a further review of the evidence of the benefits to society from woodland and nature more generally. Therefore, the key task for this 'Annex 8: Benefits to Society Review' is to provide additional evidence of the wider social and cultural benefits (and disbenefits) potentially available through woodlands, that extend beyond the concept of cultural ecosystem services and benefits addressed in the original Evidence Pack. It also provides the opportunity to review the evidence around a wide range of factors that might influence the realisation of social benefits.

During the commissioning process, the Welsh Government emphasised that the evidence provided must, as much as possible within time and resource constraints, reflect the collective views of the community by reviewing the literature in an objective way highlighting where evidence is contradictory or weak. The rapid production of this, and the other Annexes, meant an expert approach of key evidence was expected rather than a systematic review. Experts and additional collaborators were invited to either contribute text or review the drafts; and the report text was exposed to challenge and review by the authors of the other Annexes and a set of external experts in addition to review both by the Welsh Government and ERAMMP programme team.

In this report we focus on forests and woodlands rather than all green space, and the terms 'forest', 'woods' and 'woodland' are used synonymously and interchangeably, unless there is explicit information to the contrary within a particular section. As with the other reports in this series, there are no implied characteristics specific to any of these terms when used within this report.

1.2 HEALTH

There is a substantial body of evidence about the links between engagement with trees, woods and forests, and people's mental health and wellbeing, and physical health. However, there are challenges in measuring causation of changes in mental and physical health and engagement with woodlands. The connection between mental and physical health also presents challenges in terms of disentangling changes, as these two things are often linked very closely in people's experiences. Much of the evidence around improvements in mental health and well-being is from wider nature and greenspace studies. Evidence is mixed as to the extent of any specific advantages to be gained from engagement with woodlands as

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[1] https://erammp.wales/en/r-forest-evidence

opposed to other types of greenspace (which inevitably includes trees) as limited comparisons have been made. Nevertheless, there are multiple experiential reports about woodland environments as places of refuge, escape and sanctuary, that seem to be unique to these spaces.

Much of the evidence is from outside of Wales, some of it international. There is also only limited evidence of changes being sustained over the long term. This is a gap in the evidence but does not imply that changes are only temporary. More research is required in this area to understand what approaches work best for which sections of society. Targeted projects and initiatives that engage people more actively with woodlands for mental and physical gains, record changes in the immediate term or during the lifespan of the project but little evidence has been found of repeat monitoring of the same people longitudinally.

There are many examples of woodland initiatives that have targeted particular groups in society, including those least active, those with a range of mental health conditions, or those living in deprived areas in Britain, that aim to address health inequalities. The evidence around the success of these is somewhat mixed, but overall suggests that urban and urban fringe projects close to people's homes can bring positive outcomes for those in most need.

1.3 SOCIAL CAPITAL AND GOVERNANCE

A substantial body of evidence exists to suggest that enabling and facilitating the involvement of local communities in the governance of woodlands, and specifically community woodlands, leads to the realisation of considerable social benefits, in the form of social capital. There are many facets to this social capital, but it is generally considered to encompass trust, a sense of belonging and community cohesion. Much of this evidence is drawn from Wales, but is also echoed within international experiences.

The extent to which similar social capital benefits are realised in other 'types' of woodlands, such as the public forest estate or urban woodlands is less certain. Whilst there are opportunities for 'Friends' groups to be connected to the Public Forest Estate, many of the 'good' examples of this are currently in England. Evidence from Wales gathered within the last decade suggests that communities still feel excluded from the governance of Public Forests. Meanwhile some community groups have been found to be somewhat 'exclusive' and thereby exclusionary.

1.4 COMMUNITY PREFERENCES AND SOCIO-CULTURAL LINKS

This review has facilitated the consideration of a wide range of factors that may affect the extent to which social benefits can be realised from engagement with trees, woods and forests. Among the topics addressed are:

Personal motivations for visiting woodlands and engaging in conservation volunteering; Barriers to visiting and engaging with woodlands; Proximity of woodlands to populations

- There is an extremely complex picture in terms of what motivates or prevents people from visiting woodland environments or engaging with them in other ways. This incorporates many aspects that relate to the individual and their own circumstances, including confidence, health, material means, social group, perceptions and residential location. Current evidence suggests that there are a range of barriers that specific groups face in engaging with woodlands including older people with mobility issues, the disabled, lower socio-economic groups and ethnic minority groups. Some of these issues are linked to inequalities that certain sections of society face in their

day to day lives. Some of the barriers include site specific issues related to facilities and infrastructure while other barriers occur off site and can include transport, issues of confidence, concerns about safety and getting lost, as well as issues to do with what sites are accessible to the public and knowledge of what to expect when visiting a woodland.

- The implications of these issues are that it is not simply a question of planting trees in a certain location that is close to populations (although this is important for social benefit) as the idea of accessibility is not only a matter of 'how far is the woodland from my home?'.

Public preference for woodland type

- There is a considerable amount of international evidence about what people prefer in terms of woodland type. Generally, the evidence suggests that variety and some complexity is favoured in wooded landscapes which includes mixed forests with mature trees.

Public opinion on landscape change to woodlands and individual trees in urban areas

- There is some evidence about what people in Wales prefer to happen after large-scale felling changes the forested landscape. However, generally there is a lack of evidence about the topic of landscape change with regard to woodlands. Given the policy focus on future landscape change through new planting this is an important subject for further research. The topic of landscape change through new planting should also address the scale of that change.

- Evidence from Wales about people's opinions of trees in urban areas is that trees in parks and gardens are the most valued, more so than nearby woodlands or street trees. There is also evidence from Wales that people express a willingness to engage in activities related to the trees in their area, from reporting problems to the local authority to watering and monitoring the condition of trees in public spaces.

The extent to which woodlands and tree planting projects are embedded within the local and national culture

- This important aspect was one of the most challenging areas of the review to find any evidence for. One of the most pertinent examples is the National Forest in England, now more than 20 years established. This large-scale project stretching across the English midlands has embedded woodland creation within areas where the coal mining industry dominated for generations.

- Aiming to achieve both environmental and social recovery, this programme offers considerable learning, particularly for those parts of Wales that have a similar mining heritage to the English Midlands.

- The historic and cultural features of a woodland provide an important connection with the cultural heritage of people and places. The value of a woodland can be increased for both communities and visitors by interpreting these features through activities such as artwork installation and cultural events.

- With regard to the Welsh language, it is pertinent to note that many woodland projects and initiatives in Wales have names in Welsh. Use of Welsh names is a powerful way to interpret the woodland landscape and promote a sense of history and cultural identity.

- The extent to which these issues influence the realisation of social benefits is unclear.

The extent to which trees are part of a broader green infrastructure (particularly in urban areas)

- Increasingly it is recognised that trees outside of woodlands and trees as part of wider greenscapes and green infrastructure networks can be as important for generating social benefit as areas of forest and woodland. This is particularly so in built-up areas. Individual trees in parks and gardens are known to provide positive place experiences for residents and visitors.

- When considering the issue of green infrastructure, evidence is emerging of the significance of connectivity of ecological features, not only for ecological benefit but also social benefit.

1.5 COVID-19 IMPACTS

2020 has strongly demonstrated the importance of external events like the Covid-19 pandemic that can impact severely on how people gain benefit from local greenspaces, including trees and woodlands. It has also shone a light very brightly on the importance of locality and localness, as well as equitability of access. A lot of attention in the media, and through environment sector organisations, was paid to the importance of nature as a source of wellbeing during difficult times and the various lockdown periods experienced across the United Kingdom and internationally. Some of this attention was from within Wales. There is a growing body of academic work on this topic too.

Evidence points towards an increased appreciation of nature and contact with nature and what was accessible locally. Inequalities have been highlighted for those with lower educational attainment, lower income and those living in deprived areas, as well as for older adults, those with a long-term illness and some families with children. There are important lessons to be learnt to inform the design of future woodlands and a need to recognise the significance of trees and greenspaces during such episodes.

1.6 NEGATIVE IMPACTS AND DISBENEFITS

This review has provided the opportunity to consider some of the dis-benefits that people can experience when engaging with trees, woods and forests, and some of the negative impacts that can occur from management or activities within woods and forests. Encouraging and promoting access to woods and forests and other greenspace areas with trees may sometimes mean having to manage conflicts and unwanted behaviour. It has been recognised that illegal and anti-social activity associated with forests, woodlands and trees is a growing concern. For example, building and use of illegal mountain bike trails, illegal off-roading, wildfires started deliberately and incidences of fly-tipping are some of the issues which are presented in the review. Crucially, much of the evidence around the issues in this section is drawn from Wales, and experiences of people in Wales. However, much of this is now quite dated (more than 10 years old). The evidence around disbenefits is connected to some of the barriers that prevent people from visiting woodlands, namely fear of anti-social and criminal activities, feelings of being unsafe, and experiences of woodlands as unpleasant, untidy and badly maintained spaces.

Fears, perceptions and previous experiences can all be addressed and ultimately overcome. Addressing these issues means working creatively and collaboratively, building on existing partnerships between crime prevention officers, local authorities and community groups. The review presents some examples of successful initiatives in Wales. Only by acknowledging

the wide ranging negative experiences, conflicts, and negative activities can they be overcome and the social benefits thereby enhanced.

1.7 OBSERVATIONS & GAPS IN KNOWLEDGE

Joined up thinking is needed, particularly with regard to ensuring that engagement with trees, woods and forests is possible for all sections of society. Many aspects of social benefit discussed in this review are related to wider societal challenges, including deprivation, health, lifestyle, and residential location. As Covid-19 has demonstrated, and as the evidence elsewhere in this review shows, opportunities for enjoying the varied wellbeing benefits of woodlands, and thriving from greater social capital, are not experienced equally across society.

Many of the topics that the Welsh Government asked to be considered by this review would benefit from additional Welsh evidence, for example, public opinions of landscape change relating to trees, woods and forests.

In many cases, longitudinal studies are needed to demonstrate whether behaviour change continues, following targeted engagement in woodland projects and initiatives, however this requires long-term funding. A robust approach is needed to longitudinal studies which should include the gathering of baseline data before an intervention to explore change over time.

It would be of benefit to know whether the considerable range of anti-social and criminal activities recorded during the noughties through various studies remain at the same level in Welsh woodlands and forests in the present day.

The extent to which there is a link between the generation of social benefit from trees, woods and forests, and the inclusion of local and national cultural heritage within woodland projects, is unclear. More evidence is needed to address this question.

2 INTRODUCTION & APPROACH

The National Forest for Wales programme has developed into a programme that extends beyond forestry and environmental aims only, into a major national investment for building a sustainable future. This is emphasised by the inclusion of the National Forest for Wales as Policy 15 in the Wales National Development Plan (Welsh Government, 2021). It aims to use the potential that woodlands and trees create for generating multiple interconnected benefits, to effect change across multiple domains as well as meeting the Welsh Government's biodiversity and climate change targets.

This report is Annex 8 of a review that was commissioned in 2020 by the Welsh Government from the Environment and Rural Affairs Monitoring and Modelling Programme (ERAMMP) to provide key evidence of potential benefits and disbenefits of woodland creation, woodland expansion and managing undermanaged woodland, to provide an evidence base to inform the development of a National Forest for Wales.

The ERAMMP National Forest Evidence Pack that was subsequently produced and published in 2020[2] drew evidence from across the scientific community and was co-authored by 41 authors from eight research organisations. Although generally accepted as being a comprehensive review of the available evidence on woodland in Wales, a review of the evidence pack highlighted the need for a further review of the evidence of the benefits to society from woodland and nature more generally. This is especially true since the COVID-19 pandemic, and as the National Forest for Wales programme has developed into a programme for the people of Wales.

Therefore, the key task for this 'Annex 8: Benefits to Society Review' is to provide additional evidence of the wider social and cultural benefits (and disbenefits) potentially available through woodlands, that extend beyond the concept of cultural ecosystem services and benefits addressed in the original Evidence Pack.

A framework template of topic sections and sub-sections has been provided by the Welsh Government and this has informed the structure of the review. The project team from Forest Research have made minor changes to this structure to more effectively capture the evidence available (specifically some of the sub-sections have been altered and additions made). However, the five broad section headings included are as follows:

- Health

- Social Connection and Community Preferences

- Socio-Cultural Links to Woodlands

- COVID-19 Impacts on People, Woodlands and wider nature

- Woodlands Negative Impacts on Society

As these are a combination of factors influencing engagement with woodlands, and the social benefits (or disbenefits) that may arise from that engagement, the review structure is represented visually in the schematic below.

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[2] https://erammp.wales/en/r-forest-evidence

TREES WOODS FORESTS

WIDE RANGE OF FACTORS THAT MAY AFFECT THE REALISATION OF SOCIAL BENEFITS (DISBENEFITS)

Personal motivations for visiting woodlands and engaging in conservation volunteering (Section 4.1)

Barriers to visiting and engaging with woodlands (Section 4.2)

Proximity of woodlands to populations (Section 4.3)

Public preference for woodland type (Section 4.4)

Public opinion on landscape change to woodlands and individual trees in urban areas (Section 4.5)

Governance of woodlands (Section 4.6)

Incorporating cultural features with woodland planting (Section 5.1)

The Welsh language and woodlands (Section 5.2)

Green infrastructure (Section 5.3)

SOCIAL BENEFITS AND DIS-BENEFITS THAT MAY ARISE FROM ENGAGEMENT WITH TREES, WOODS, FORESTS

Mental health (Section 3.1)

Physical health (Section 3.2

Tackling health inequalities (Section 3.3)

Social capital (Section 4.1)

Negative impacts (Section 7)

Figure 2.1: Schematic of review structure

To build on the evidence uncovered for the earlier ERAMMP National Forest Evidence Pack on cultural ecosystem services, a five-pronged approach was taken.

Online searching (through Google) was used extensively to identify details of relevant Welsh initiatives, projects, resources and contacts not likely to be found through conventional academic database searches.

Considerable staff time was dedicated to directly contacting key individuals with specific knowledge and experience of relevant Welsh programmes and evidence. This included emails, informal interviews and Teams meetings.

The project team members between them have a deep knowledge and extensive research experience of the literature and evidence in this area, hence expertise was pooled and recorded in a spreadsheet for reference throughout the review writing process.

The previous ERAMMP review on cultural ecosystem services was re-visited to ensure that this current review captured and built on the evidence reported in that document.

In line with standard literature review protocols, search strings were constructed (using the report template section headings and sub-headings provided by the Welsh Government) for use in formal literature searches in Scopus and Google Scholar.

Throughout these steps the priority was to identify sources and evidence from Wales wherever available.

In this review the term 'engagement with woodlands' is used and this can include both direct and indirect engagement. Some of the evidence of benefits covers greenspaces rather than woodlands specifically (as requested by the Welsh Government). At no point do the authors assume that greenspaces and woodlands are the same but suggest that many greenspaces include trees.

3 HEALTH

The project commissioners requested that the review of health benefits that might be obtained through engagement with trees, woods and forests (and nature more broadly) be divided into three main sub-sections, namely, mental health, physical health, and the role of forests in tackling inequalities in health. We recognise that there are other mechanisms through which health benefits from engagement with trees and woods can be realised, such as noise and air pollution reduction. However, these are not the focus of this review, but we do briefly mention air pollution reduction later in the physical health section.

Where possible, evidence is drawn from literature and evaluations relating to Welsh projects, programmes and studies.

3.1 CONNECTIONS BETWEEN WOODLAND, NATURE & MENTAL HEALTH

For this section of the review the term 'mental health' is used to refer to mental health, mental well-being, and emotional experiences in a broad (i.e. non-clinical) sense.

There is growing acknowledgement about the mental health benefits that can be obtained through engagement with trees and woods, and these benefits are considered to be of great value to individuals, communities and society broadly. Such benefits to mental health are diverse and can be difficult to capture, but forest visitors and participants involved in projects and initiatives encouraging engagement with trees and woods frequently report significant positive mental health and well-being impacts.

Examples include people reporting feeling a sense of well-being through being in relaxing and stress-free environments, as revealed in an evaluation of the Cydcoed programme (Owen et al., 2008). Others have reported experiencing peace and calm, and feelings of stress reduction from difficult and sometimes chaotic lives (O'Brien, 2018). Others still have found escape and freedom, and benefit from a feeling of not being pressured (O'Brien, 2019), becoming more relaxed in natural settings, and enjoying positive group experiences (National Community Forest Partnership, 2012). A recent systematic review of the types and characteristics of urban and peri-urban green spaces having an impact on mental health and wellbeing found that forests, parks, and other urban green spaces can improve mental health, and that in urban areas, not only forests and parks mattered, but also tree canopy and street greenery (Beute et al. 2020). Overall, people often report having a range of positive feelings through sensory experiences in woodland settings (O'Brien et al., 2014; Hall et al., 2019).

3.1.1 Evidence from Wales

There is a limited amount of evidence about the mental health and well-being benefits that people have gained from involvement in targeted programmes in Wales, where the purpose has been to help more people engage with woodland settings. The evidence below is drawn from evaluations of Actif Woods Wales Programme (Simons, 2020; Gittins et al., 2021), Wellwoods and EcoConnect projects (Lord, 2020), two Forest Schools in Wales (Murray et al., 2003), and the Mentro Allan Programme (Mentro Allan Central Support Team, 2008) (note that the latter is not focused on woodlands).

The Coed Lleol/Small Woods Wales's Actif Woods Wales Programme[3] began in 2010 with the aims of connecting people to local woodlands for health and wellbeing purposes and maintaining and promoting healthy woodlands. The programme engages adults living in areas with high health needs, low employment rates and often poor access to services. The programme also works with health services to promote social prescribing. The Actif Woods sessions usually combine woodland skills, knowledge development, healthy eating and exercise. Specific activities include bushcraft, fire building, charcoal making, coppicing, woodworking, willow-weaving, green gym sessions, foraging, and tree and wildlife identification. Some sessions include campfire cooking and healthy eating. Participants may also get involved in litter picking and woodland management.

Two evaluations of the Actif Woods Wales Programme provide some evidence of positive effects on mental health and well-being, drawing on both qualitative and quantitative measurement. Both Simons (2020) and Gittins et al. (2021) were able to demonstrate improvements in mental health and well-being for those individuals engaged through the programme. Participants self-reported their well-being using the Warwick Edinburgh Mental Wellbeing Scale (WEMWBS), and using this scale, well-being was shown to have improved, on average, after participating in weekly activities (Simons, 2020). Similarly, Gittins et al. (2021) found, through end of course quantitative results, significant positive increases in mental wellbeing, self-efficacy, and self-esteem. There were particularly significant improvements for people with pre-existing mental health conditions, thereby emphasising the role that woodland engagement can play in helping people with poor mental health.

To add to results gathered through quantitative measures additional qualitative evidence is available to further understand the benefits of the Actif Woods Programme. Using open ended questions and coding (or categorising) responses helps researchers understand, often in more depth, what participants think and feel. Regarding the Actif Woods Programme and the possible ways people may have benefitted from participation, respondents to an open-ended question perceived the greatest changes they experienced were in relation to their mental wellbeing (Simons, 2020). In more depth, Gittins et al. (2021) were able to show through participant narratives how woodlandshad been experienced as a 'balm', had a positive impact on mood and provided feelings of escape. The evidence gathered through qualitative methods captured positive changes, during the programme and three months after its end, in 'self-perspective' that had led to wider lifestyle changes, outside of the programme. For some participants this meant they were able to change habitual sedentary lifestyles and become less socially isolated. These findings are particularly important in demonstrating how such woodland engagement programmes may help people develop social confidence and thereby increase their wider social interactions. However, it should also be noted that some aspects of the evaluation failed to demonstrate mental health benefits. Specifically, an evaluation of the parts of the programme aimed at family groups, rather than individuals, did not reveal the same self-reported mental health gains.

Different approaches to gathering evidence about the benefits of engagement with woodlands can elicit various aspects and details of experience. Another up to date source of evidence from experiences in Wales (Lord, 2020) comes from an examination of case studies including Wellwoods and EcoConnect, using ethnographic approaches. Similar to the Actif Woods activities, the researcher was able to discover the effectiveness of activities including woodland plant identification walks and talks, green-woodworking, bushcraft skills, woodland management, conservation tasks, cooking on open fires, and group discussion in

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[3] https://www.smallwoods.org.uk/en/coedlleol/

woodland settings as a form of "ecotherapy". This diverse range of activities in woodland settings was found to provide opportunities for seeking refuge and getting away from causes of distress and were "restorative". The locations represented healing spaces that acted as a "retreat", or "sanctuary" and provided "escape". Peoples' experiences were therefore about "reconnecting" with nature and "disconnecting" from what was unhealthy within spaces associated with everyday life. Participants were able to "hide away" and take part in "slowing down" "lingering" experiences in woodland spaces.

What these findings demonstrate is the detail and subtleties of the benefits that are encompassed under the heading of mental health benefits. Further detail is found in a review of forest school experiences for school children in Duffryn and Flintshire (Murray et al., 2003), whereby a link was found between school activities carried out in the environment specific to forest schools, and positive outcomes for the children. These positive results related to self-confidence, self-esteem, team working, and motivation, as well as pride in, and greater understanding of, the environment.

While the review team at FR was asked to consider the mental and physical health benefits of woodlands and nature in separate sub-sections it is not always straightforward to separate these two aspects of benefit. The Mentro Allan Programme in Wales was designed to help residents in Wales meet the recommended levels of physical activity each week and use local natural outdoor environment close to where they live in order to do this. However, when feedback about the programme was collected from participants (Mentro Allan Central Support Team, 2008) many of the comments demonstrated the mental health and well-being benefits associated with social connections, escape and aesthetics, as illustrated in the following quotes:

> "Good friendship/company";
> "Immensely satisfying";
> "Enjoying the countryside & pleasant views";
> "Re-socialisation";
> "A lifeline, a reason to come out of the house and meet people";
> "Don't care where we go, what the weather is I just enjoy the company and being out";
> "Get out of house, now feeling better, a good reason to get out when you feel low, have learned a lot and applied it in garden, feeling more confident about other things".
> "Happy!"
> "Mentally stronger –facing fears and working hard to overcome challenges";
> "More confident –I've overcome fears";

3.1.2   Evidence from elsewhere

Other evidence of the mental health benefits of engaging with woodlands and greenspace is available from locations outside of Wales. At a population level those living near to natural environments can benefit from proximity. A longitudinal study showed that people in urban areas reported lower mental distress when living in areas with more greenspace than those living in areas with less (Alcock et al. 2013). Other evidence focuses on interventions and small scale studies as outlined below.

Two publications are reviewed that evaluate programmes in England, one with a focus on woodlands, the second on parks and other greenspaces (Goodenough, 2015; Dobson et al., 2019). The 'Good from Woods' project (Goodenough, 2015) ran from 2010 to 2014 and sought to enable 11 woodland activity providers in the southwest of England to evaluate the well-being benefits generated by the initiatives and projects being managed. Using diverse

research methods with diverse groups of people, including those with poor mental health, the evaluations uncovered many examples of impact on peoples' psychological and emotional well-being that echo the findings reported above from various Welsh initiatives. The authors report that people experienced greater self-confidence, a sense of purpose, and feelings of being more in control of their own spaces (particularly through involvement in community woodlands). Importantly, the significance of woodland settings was emphasised as places that provide people with a sense of getting away from the concerns of their "everyday" lives, help them feel more relaxed, and enable the development of social connections. The association between access to green spaces and stress relief was also found by Dobson et al. (2019). Some of the projects evaluated in the 'Good from Woods' programme sought to involve particular segments of the population, such as younger people and families. In the case of children and young people the woodland-based projects and activities were found to help them feel safe and capable. Children who were supported to spend time in woodland spaces were able to feel happier and more relaxed in such places, away from anxiety in their lives.

Also, although the evaluation of Actif Woods was not able to provide evidence that family groups benefited from the sessions they engaged in, in the 'Good from Woods' evaluation this evidence was revealed. By seeing their children engaging with the natural world in woodland settings parents felt positive about their 'parenting choices' and were happy to see their children in those environments. An intervention in Scotland called 'Branching Out' is a programme run by Scottish Forestry in partnership with mental health services in Scotland and provides a 12 week programme of physical, conservation, bushcraft and environmental art activities in woodland settings. An economic study of the programme using surveys showed small but significant improvements in participants' mental health, vitality and social participation (CJC Consulting, 2016).

O'Brien et al. (2019) highlight in a review that potential benefits of contact with nature (including forests) for mental wellbeing, can occur from living in proximity to nature, engaging with nature as part of everyday life, through green health promotion activities such as the Active Forests Programme in England (O'Brien and Forster, 2020) and through targeted green therapeutic care activities which focus on people with specific mental health problems.

Research suggests people can gain mental health benefits from engaging with nature in terms of lower stress (Haluza et al. 2014), increased attention and reduced sadness and fatigue (Bowler et al. 2010; Thompson Coon et al. 2011), and more positive moods and emotions (McMahan, 2015).

There is also a number of studies that have identified benefits to mental health of contact with nature for vulnerable groups, particularly those with mental health problems. For example, Barton et al. (2011) found that nature, exercise, and social components have a role to play in supporting those with mental health issues. Others have found that well-designed natural environments have many benefits and argue for nature as an upstream intervention to manage a range of mental health problems (Sarkar et al. 2018).

More recent studies, particularly in Asia, focus on the physiological effects of contact with forests which can link to mental wellbeing. These show that forest environments can help to lower pulse rate and blood pressure, reduce cortisol levels, and suppress the sympathetic nervous system (Sallmannshofer et al. 2019). However, these are generally small scale comparative studies with often quite artificial processes and not very representative populations.

3.1.3   Challenges in demonstrating mental well-being benefits

The evidence about the mental well-being benefits to be obtained from engagement with woodland spaces is not quite all in agreement. In the Woodlands In and Around Towns (WIAT) initiative in Scotland, an evaluation study did not find any benefit from the woodland environment interventions for community-level mental health within six months of completion. They concluded that external factors may be the primary influence on health outcomes (Ward Thompson et al., 2019). As noted previously, some aspects of the Actif Woods evaluation (notably with family groups) were not able to capture evidence of benefit using the measurement approaches applied.

Part of the challenge is how to consistently measure change in peoples' mental well-being following their participation in programmes such as those described above. As Binner et al. (2017) note there is no one standard approach to measuring 'levels' and changes in mental health. As the reviewed studies show, approaches are diverse and span the range of social science approaches from narrative through to measurement scales. In addition, demonstrating causality is a challenge, as illustrated by the WIAT study findings. Establishing control groups is problematic given the complexity of environments and peoples' lives. Further, proving that engagement in woodland spaces brings specific mental health benefits not likely to be obtained from engagement in other environmental or social spaces is difficult if not impossible.

3.2 Physical health benefits of woodlands

As noted above the interconnection between the mental health benefits and physical health benefits obtained from engagement with woodland environments can make it difficult to separate them. Thus, much of the evidence in this section draws on the same sources as the previous section. Nevertheless, there are studies that have focused explicitly on changes in behaviour i.e. levels of exercise and physical activity (thereby assuming this improves physical health, particularly if levels of physical activity meet the recommended level of 150 mins per week) as well as a number of quantitative studies that have used health metric data combined with other datasets.

Physical activity interventions in woodlands

Programmes in woodland environments can lead people to take more regular exercise, which is expected to lead to some improved physical health, as evidence from the Cydcoed and Active Forests evaluations show (Owen et al, 2008; O'Brien and Forster, 2019). In programmes such as these, physical activities in woodland environments are actively promoted and engaged in (Morris, 2006) with the impact of helping people to get healthier and in some cases lose weight (O'Brien, 2019).

Community forests can be particularly good for creating health benefits where the emphasis is on providing opportunities and spaces for informal recreation, such as walking, cycling, or running (Land Use Consultants and SQW Ltd, 2005). This can be achieved informally by developing paths and trails, or more formally by delivering guided walks (Land Use Consultants and SQW Ltd, 2005). A number of studies suggest that the use of and access to greenspaces in children, senior citizens and older adults is associated with walking for physical activity (Sugiyama and Ward Thompson, 2008; Chocrane et al., 2009; Schipperjin et al., 2013; Gardsjord et al.; Stewart et al., 2018). Programmes targeted at specific user groups with particular needs may also be enabled by structured Community Forest programmes, such as those for adults with learning disabilities. The Community Forest programme in England was found to have achieved high levels of engagement and interest in woodland activities including practical woodland management tasks, making fires and

cooking, sensory activities, and discovering nature amongst such groups (National Community Forest Partnership, 2012). In terms of generating physical health benefits such targeted initiatives can be highly successful.

3.2.1   Evidence from Wales

Some of the evaluation studies referenced in the previous section measure levels of physical activity (Simons, 2020; Mentro Allan Central Support Team, 2008). By applying the International Physical Activity Questionnaire (IPAQ) or a Physical Activity Level (PAL) form before and after involvement in programmes, evaluation teams were able to demonstrate that levels of physical activity did indeed increase for participants in Mentro Allan. For example, when comparing PAL 1 and PAL 2, 43% of adults and 48% of young people increased their levels of physical activity over the six months of their involvement in the programme (Mentro Allan Central Support Team, 2008). While that is considered a positive result it also shows that more than 50% of participants did not increase their levels of physical activity between period 1 and period 2 (6 months later). Nevertheless, in line with official health guidelines, the increased physical activity is assumed to lead to more positive health outcomes and sustaining good physical activity levels is important.

While the quantitative data suggest partial success, these direct comments from participants demonstrate their experiences and positive outcomes, as do the recorded observations of programme managers (for example, from Mentro Allan Central Support Team, 2008; and Goodenough, 2015). Selected qualitative comments collected from participants about their physical health benefits from Mentro Allan demonstrate how individuals experienced positive impacts through participation:

> *"Keeping fit";*
> *"Helps with health and angina";*
> *"Gives me strength";*
> *"Improved my balance";*
> *"It helps also with other activities like kayaking-stronger arms and body".*

The importance of woodland and forest settings for physical health is that they provide attractive places for recreation and exercise, as revealed by the findings from the Public Opinion of Forestry survey for Wales in 2019 (Forest Research, 2019). Woodlands and forests are often identified by users as places where children can let off steam (O'Brien & Forster, 2018) by providing a place for them to play, again as revealed in the Cydcoed evaluation (Owen et al, 2008).

These comments include a combination of physical health issues, that incorporate general fitness and conditioning, as well as actual physical health conditions, demonstrating the nuanced aspects to this area of benefit. Picking apart these 'categories' of physical health benefits would add further to the evidence.

Evidence from elsewhere

Similar to the studies referenced above for Wales, the Active Forests programme (a partnership between Forestry England and Sport England) focused on encouraging physical activity in woodlands through a combination of infrastructure (i.e. running, walking and cycling trails), and organised events and activities (such as Nordic walking, buggy fit, park run etc.). An evaluation found some changes in physical activity levels between two surveys run three months apart, with a significant amount of sporting activity undertaken by the less active groups (O'Brien and Forster, 2020). The qualitative data from the Active Forests

evaluation found that targeted activities in the forest providing challenge and a supportive atmosphere were important for encouraging physical activity among participants (O'Brien, 2019).

Recorded observations from programme managers from 'Good From Woods' noted that children taking part in Forest School activities in a woodland environment are more physically active than they are during lessons based in classrooms and school grounds. Woodland activities can enable people to engage in different or increased activity in a way that is directly related to the environment. For example, it has been noted that some teenage girls, may feel more comfortable being active and 'getting messy' in the woods, than they would in other settings. Similarly, it has also been found that if sporting activities are 'reframed' and relocated into woodland environments it can make it easier for some adults to 'reconnect' with such activities where they had previously felt excluded.

What these evaluations do not demonstrate is the extent to which increased activity levels are maintained beyond engagement in the programmes. Also, they do not directly point to improvements in physical health, however if the programmes highlight that people are achieving the recommended level of physical activity per week of 150 minutes, then physical health benefits are expected to accrue.

One of the recognised ways in which levels of physical activity can be converted into a 'economic value' for physical health is through the use of Quality Adjusted Life Years. (The assumption is that as people exercise more, they experience better health and more years of healthy life, and this can be converted to a monetary value through assumptions about avoided health costs).Through forest recreation data from 14 woodlands in England and Wales (the six in Wales were: Afan Forest Park, Brechfa, Gwydyr, Hafren, Moel Famau, and Newborough) Moseley et al (2018) concluded that the monetary estimates for the QALYs ranged from £6 to £8542 per person and from £2581 to £70,832 per woodland. These values varied considerably between woodlands due to the range of facilities provided, activities undertaken, frequency of visits and proximity of population.

Physiological benefits have been identified in a number of studies. Mears et al. (2019) were able to demonstrate that areas of a city (Sheffield) with a high diversity of tree planting were associated with lower levels of self-reported poor health. Similarly, Donovan et al. (2013) analysed data from 15 U.S. states to demonstrate that the loss of trees in urban areas was associated with an increase in mortality related to cardiovascular and lower-respiratory-tract illness.

Other ways in which trees help to contribute to better physical health is through mitigating air pollution (Beckett, et al, 1998; Nowak, et al, 2018). There is a large body of literature that discusses this issue. The key points are that trees remove air pollution by intercepting particulate matter on plant surfaces and absorbing gaseous pollutants through the leaf stomata. A study using computer simulation to model this process in 86 cities in Canada, found that overall health impacts included the avoidance of 30 incidences of human mortality (range: 7–54) and 22,000 incidences of acute respiratory symptoms (range: 7900–31,100) across these cities (Nowak et al, 2018).

The challenge remains with some of the studies that correlation is not the same as causation. Indeed, Husk et al. (2016) conducted a systematic review of 21 publications that had studied greenspace engagement activities, including tree planting, and the connection to health outcomes. They concluded that there was little quantitative evidence of what the impacts of nature-based interventions are and for whom.

However, Husk et al, (2016) concluded that qualitative research commonly uncovers high levels of perceived health and well-being benefit among participants, and this is borne out by a number of the qualitative studies reviewed here.

3.3 WOODLAND'S CONTRIBUTION TO TACKLING HEALTH INEQUALITIES

(This section also links to the section below on 'closeness to populations').

Health inequalities may exist due to certain circumstances or conditions experienced by individuals or due to being resident in particular locations (for example where access to support services is limited or other environmental conditions are detrimental). In many cases these factors are combined. Socio-economic status, deprivation, geography can lead to health inequalities. Evidence for this section is therefore drawn in some cases from projects and interventions that have targeted particular population segments, while other evidence is from location-specific initiatives. While woodland interventions can in some cases support the targeting of health inequalities easy accessibility to good quality woodlands and greenspaces near to where people live is particularly important.

A whole population level study in England by Mitchell and Popham (2008) found populations exposed to greener environments had the lowest levels of health inequality related to income deprivation. They suggested that greenspaces that promote health could be important in reducing socioeconomic health inequalities.

Targeting specific population segments

O'Brien et al. (2010) in a review of urban health, health inequalities and the role of urban forestry in Britain, highlighted that an urban forestry approach to tackling urban health inequalities should focus on ensuring urban forests around residential areas that could provide restorative benefits and opportunities for social connections. It suggested that the focus should be on providing easy and routine access (including visual access) to urban forests rather than providing large scale forests further away. The evidence suggests that urban forests immediately around homes and workplaces are important for positive health outcomes.

The evaluation of Cydcoed has already been reviewed above, and some of the findings about the benefits to health discussed (Owen et al, 2008). The programme was funded through the EU Objective 1 programme and the Welsh Government's 'Pathways to Prosperity' scheme and was aimed at two key areas: Communities classified by the Wales Index of Multiple Deprivation as being the most deprived, and communities with no access to community greenspace for relaxation and exercise. Given the focus on communities classified as being deprived it has already been shown how such a programme can help to tackle health inequalities. A key finding from Owen et al (2008) was that half of those questioned stated they had experienced an improvement in their overall well-being since being involved in a Cydcoed project. Further, just over half of people involved in a Cydcoed project said that taking part had led them to take more regular exercise, and over 40% stated their physical health had improved since becoming involved.

The PATT Foundation[4] supports the welfare of veterans via nature-based therapy courses and engagement in nature-based projects, including tree planting, to support those suffering post-traumatic stress. The Foundation has recently been established in Wales and is seeking partners to deliver tree planting projects in the future (pers comms, PATT Foundation). Monitoring and evaluation of these courses and projects will be important to understand how they are developing, and any benefits participants accrue.

Much of the evidence reviewed for this section is from outside of Wales and draws on programmes and initiatives in England and Scotland.

It is surmised that forest-based interventions can be used to target and reach those who may suffer health inequalities, such as those of lower socio-economic status, those in deprived areas, those who are unemployed or who suffer from particular health conditions. By way of example, the Westonbirt Community Project targeted adults with mental health problems and dementia, and young people with autism and emotional and behavioural difficulties. The project offered a programme of regular activities in woodlands that were creative and had a woodland conservation focus. The results of research into this project highlighted the importance of repeat visits for enabling site familiarity, creating a supportive and non-judgemental environment, and helping providers to develop understanding of the needs of those with specific problems. It was also found that using creative, sensory and craft activities in the forest environment was important for enabling these often-marginalised groups to build confidence and self-esteem (O'Brien, 2018).

An economic study of the 'Branching Out' programme run by Scottish Forestry using surveys showed small but significant improvements in participants' mental health, vitality and social participation. The cost of one Quality Adjusted Life Year (QALY) delivered by the programme was just over £17,000 which compared with NICE guidance benchmarking £30,000 for an intervention to deliver one QALY (CJC Consulting, 2016). Hence, it was demonstrated to be cost effective using QALYs, coming in considerably below the threshold value used by NICE at the time.

A much larger scale intervention in Scotland called the 'Woodlands in and around Towns' programme (WIAT) run by Scottish Forestry (formerly Forestry Commission Scotland) is aimed at deprived communities across the central belt. A large-scale evaluation explored whether the WIAT programme helped to improve community mental health. It found increased nature visits, improvements in woodland quality, and greater awareness of local woods for the three communities that received the programme intervention compared to three control communities. People who used the woods found them restorative, but overall community mental health failed to improve (Ward Thompson et al, 2019). The authors concluded that environmental interventions in deprived urban locations can positively impact greenspace usage, perceptions of local environment and, potentially, activity levels and quality of life (Ward Thompson et al, 2013).

Location specific interventions

Some programmes focus on specific woodlands for example the Chopwell Wood Health project used social prescribing and walking in the forest as a means to support a deprived community near Gateshead in improving health. An evaluation of this project found people were referred due to depression, being overweight, high blood pressure and knee/back pain. Of the people who chose to access the forest for the 13-week programme of physical activity

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[4] https://pattfoundation.org/

30 completed the programme (out of 33 referrals), a high completion rate. Participants who discussed their experiences in the project through focus groups described improvements in their mobility, being able to reduce some medication and generally feeling better.

Another study in Scotland (Cook, 2020) piloted a 10-week programme of physical, conservation, bushcraft and environmental art activities based in an urban woodland setting for people living with early onset dementia. The pilot programme was used to investigate how participation can contribute to positive mental well-being and broader community belonging. Participants living with dementia found meaning in the multi-sensory experience of the woodland, in their feeling of self-worth, and in their ability to retain a sense of autonomy and identity. This approach to active use of urban woodlands and forests offers a viable alternative to traditional residential and day care activities, as well as an opportunity to promote the quality of life of people with dementia living in their own homes.

Overall, the evidence suggests that there is potential for woodland-based programmes to be targeted at specific groups who are often not able to access woodlands without help and support. Also, there are opportunities with tree planting and woodland creation to target populations of deprived communities who may have fewer woodlands close to them and / or poorer quality woodlands that suffer from lack of management and sometimes abuse.

4 Social Connection and Community Preferences

This section looks at woodlands and social connection by exploring social capital associated with community involvement with local woodlands, and governance of community woodlands.

It also considers community preferences for woodlands, drivers and barriers for public engagement with woodlands, the significance of woodlands being in close proximity to communities, public opinion of landscape change to woodlands and individual trees in urban areas. These topics are therefore divided into two: social capital as a social benefit that may be derived from engagement with woodlands; and consideration of a wide range of factors that may influence engagement with woodlands.

4.1 Social capital associated with community involvement with local woodlands

The previous section on health benefits has primarily focused on benefits for the individual (although with some discussion about the benefits of woodland programmes targeted at deprived communities). The latter part of the previous section demonstrates that it can be equally as important to generate wider social benefits, for example through the development of social connections, social capital, community trust, partnerships and friendships.

Evidence shows that community woodland initiatives can increase the level of trust in the community, help people develop stronger ties with others in their community (Owen et al., 2008) and encourage engagement with the local community (Holt & Rouquette, 2017). Partnerships can be created between public and private sector organisations that otherwise would not exist (Holt & Rouquette, 2017), and landowners may be reconnected with local users (House of Commons, 2010) such that there are positive changes in the relations between (for example) farmers and rural communities (Morris, 2006). Bonds of friendship and companionship can develop during organised forest activities (Morris 2006) meaning that people get to know more people as a result of Community Forest programmes (Owen et al., 2008). In these cases what is important about such large scale funded woodland initiatives is the social support and encouragement people get from others, and the opportunities to talk, meet like-minded people, and have an enjoyable day (O'Brien, 2019). This kind of social interaction is important and may be with new people or with friends and family (O'Brien, 2019).

Overall, evidence has shown there are many opportunities afforded by woodlands for social connections with others and this is an important example of social benefit arising from interactions with trees, woods, and forests (O'Brien et al., 2014). This section focuses on the role of Community Forests in generating social capital.

4.1.1 What is social capital in community and social forestry, and how is it defined and measured?

There is some debate internationally about how best to define social capital. This issue of definition is not a moot academic point, since defining criteria and indicators which indicate and describe social capital provide the evidence about how community and public engagement in forestry benefits individuals and society. One definition is the social goods and social resources embedded within relationships and networks, and the norms and values that structure relationships with woodland and forests (see for example Dilworth, 2006; Harshaw and Tindall, 2005). However, in their comprehensive review of research connected with social forestry, Compton and Beeton (2012) use Putnam's (1993:35-36) definition, i.e.

"*features of social organization, such as networks, norms, and trust, that facilitate coordination and cooperation for mutual benefit*". Mc Dougall and Ram Banjade (2015) cite Coleman (1988:S98) and explain that "*social capital is defined by its function …. making possible the achievement of certain ends that in its absence would not be possible*", and use Ostrom and Ahn (2008:20) to explain this enhances actors' "*ability to solve collective-action problems*".

An additional refinement that is popular in the woodland and forestry domain (see for example Baynes et al., 2015; Guillén et al., 2015), is distinguishing between bonding social capital, i.e. individuals working together, and bridging social capital, i.e. individuals connecting with external entities and building networks and opportunities for wider connection and social learning.

International research which has sought to measure social capital has often focused on levels of mutual trust and cooperation between individuals, within their communities and between themselves and other organisations involved in facilitating projects, initiatives and public engagement with woods and forests (Guillén et al., 2015; Holtan et al., 2015).

Other authors note that social capital might also be characterised as social cohesion, defined as an absence of factors which reduce people's ability to cooperate towards a common goal (Baynes et al., 2015), but can also be articulated as feelings of trust, belonging, acceptance, and connectedness which often relate to positive social interactions (Jennings and Bamkole, 2019). However, Baur and Tynon (2010) caution that although social cohesion through engagement with woodlands is widely theorised and reported, it remains poorly evidenced.

Compton and Beeton (2012) claim that social capital can also have a more negative side, citing evidence that some forms of bonding capital result in inward looking and exclusive groups, something also noted by Coleman and Danks (2016). Some community-based organisations founded on social capital may therefore lack legitimacy or the social licence to operate (Dare et al., 2014; Molden et al., 2017). Furthermore, the process of building social capital can lead to the expression of needs and values which can in turn lead to community conflict. This requires explicit and skilled resolution by individuals or groups that hold community legitimacy (Mc Dougall and Ram Banjade, 2015). However, Laerhoven and Andersson (2013), make the point that variables which are associated with good community forestry outcomes also correlate positively with the occurrence of conflict. The negotiation of group agreements and reaching consensus around actions are "*an inherent part of the dynamics involved in the crafting of the institutional arrangements necessary for collective … management*" (Laerhoven and Andersson, 2013: 127).

4.1.2 Communities' involvement in woodlands and building social capital

The ways in which communities and the public are engaged in forestry and woodland projects are many and varied, from community ownership and management of woodland for the benefit of the local community at one end of the spectrum, to ad hoc volunteering for landowners at the other (Lawrence and Ambrose-Oji, 2015; Lawrence et al., 2009; Lawrence et al., 2021; Tidey and Pollard, 2010; Wavehill Consulting, 2010a). How people engage has a bearing on the potential for different forms of nature connection, governance, and management responsibility, and therefore, the opportunities open for different forms of social capital to develop. The former arrangement may facilitate the formation of bonding social capital between the group of volunteers, whilst the latter may allow for bonding and bridging social capital amongst the wider community and stakeholders. The temporal dimension of engagement is also important, since continued, longer term engagement, presents different opportunities for the development of social capital compared with shorter term engagement (e.g. a site-based one-off community tree planting event). For example, Forrest (2018) tracking the history and impacts of community tree planting associated with Arbor Day in

Ireland, shows that these point-in-time interventions may have sparked interest in trees among the young, but there was little evidence of enduring social capital. Mc Dougall and Ram Banjade (2015) present evidence from Canada and Asia illustrating that longer term engagement through community forestry groups can change the nature of social capital so that it becomes more inclusive and representative of the wider community.

4.1.3   Evidence from Wales

One of the few projects found that tried to measure social capital facilitated by engagement in woodland projects, was undertaken in Wales. Owen et al. (2008) reviewed Cydcoed funded projects which aimed to improve urban greenspace and community woodlands, to bring about social, wellbeing and environmental benefits (as already described above). Owen et al. (2008) explicitly sought to measure social capital using a range of different measures, focusing on trust, a sense of belonging and community cohesion. The evidence derived from a survey of 153 participants in Cydcoed is summarised in Table 4.1. Just over half of the sample agreed that their level of trust in the community had increased as a result of taking part in the project, while less than 5% disagreed. Also, around 75% agreed that they knew more people as a result of Cydcoed. Eighty five percent indicated that the quality of life for the community had improved by being involved in Cydcoed, and 79% thought the projects had helped develop stronger ties between people in their community.

Table 4.1. Scored statements relating to social capital facilitated by Cydcoed projects (Owen et al., 2008: 75)

Statement	Score (% of respondents) n=153				
	Strongly disagree	Disagree	Neither agree nor disagree	Agree	Strongly agree
Taking part in the project has increased my level of trust in the community	1.5	2.3	42.7	29	24.4
Being part of the project has taught me to work more effectively with other people in the community	1.5	2.3	30.5	35.1	30.5
The project has helped develop stronger ties between people in the community	0.7	3.0	17.0	45.2	34.1
Our community's quality of life has improved	0.7	2.1	12.1	48.6	36.4
I am more confident in myself since being involved in the project	2.4	10.2	48.0	22.0	17.3
My overall quality of life has improved	1.5	4.6	33.1	41.5	19.2

Table 4.1 documents another suite of benefits seen as aspects of social capital built through project engagement. Almost half of those questioned indicated that Cydcoed had provided them with an opportunity to volunteer. This suggests a latent desire to be involved in community activities. Over a third of respondents to the research claimed the project had reduced, or stopped, anti-social behaviour in and around the woodlands and one third indicated the projects had provided a place for children to play. Case study research shows that knowledge and skills developed through Cydcoed are now being cascaded through the community.

Table 4.2. Household level impacts as a result of engagement in Cydcoed projects (Owen et al., 2008: 78)

Effect on Household	Proportion of sample (%) n=153
Provided full/part-time work	5.2
Provided seasonal work	2.0
Allowed me to volunteer to help	44.4
Provided a place for recreation	50.3
Provided space for children to play	33.3
Helped to stop or lessen anti-social behaviour in the woods	35.9
Provided a place for exercise	52.3
Provided a place where we can learn about nature	52.3
Other	3.9
Has not made any difference	11.1

Owen et al. (2008: 78) conclude that whilst it was "*problematic to ascertain the true depth and value of increased social and community capital, there is no doubt that projects have had significant influences on both individuals and their communities in terms of increased trust, networks and relationships*".

Cydcoed's contribution to community development across Wales has therefore been extensive. It has been successful in building connections between individuals, communities and organisations and focusing on localised environmental issues. The aims of projects have been important, but it is the process that is significant in terms of building confidence and capacity within the groups.

Beyond Cydcoed, the activities that Welsh communities are engaged with and that are reported as building social capital are well described in a range of documents detailing initiatives, projects and interventions of various ages and types. This includes case studies of 19 community groups involved with woodland in different areas of Wales (Wavehill Consulting, 2010b), a survey of 138 community woodland groups across Wales which detailed not only the activities, but the range of community members involved and who they worked with, the majority being the elderly, offenders, the unemployed and those at risk of not being in employment education or training (NEET) (Wavehill Consulting, 2010a).

Between 2012 and 2015 Forest Research conducted over 40 case studies of different kinds of community woodland groups and projects, including seven Welsh studies published on the Llais Y Goedwig website[5]. A selection of these case studies was discussed in Ambrose-Oji et al. (2015) describing what they did and how they might be characterised, but also showed that evidence about the outcomes and impacts, including development of social capital, remained elusive, as there was little measurement, documentation or monitoring and information was in the form of anecdote and opinion.

Baseline reviews of woodland based social enterprises in Wales, Scotland and England, ascertained for each country the size of the sector, characteristics and activity (Swade et al., 2013a; Swade et al., 2014a; Swade et al., 2014b). In Wales there was a clear overlap between community woodland groups and social enterprises, the kinds of activities they undertook, and the reported impacts of those activities. Identifying potential indicators of social capital, the survey showed that all the groups and enterprises that responded had volunteer input, with a median value of 100-200 hours a month of volunteer time, primarily

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[5] Community woodland case studies – Llais y Goedwig | Community Woodlands

focused on woodland management, conservation and biodiversity, but also on community development, skills and learning (Swade et al., 2014b).

The most comprehensive review of evidence of the outcomes and impact of involving communities in woodlands across the UK was conducted by Lawrence and Ambrose-Oji (2015). They examined 78 studies (published papers and project evaluations), covering over 600 different community woodland groups and social forestry cases, including 250 examples from Wales. They concluded that the evidence for the ecological, economic and social benefits was varied and patchy, and that longitudinal studies were rare. There was some evidence that community woodlands were working to improve woodland quality, and additionally some evidence of social impacts such as self-reported health and wellbeing benefits. However, the evidence around social capital, community cohesion and inclusion was less robust.

Swade et al. (2013b) examined the involvement of communities with Local Authority woodlands and greenspaces in England. Data was collected about numbers of groups, their activities, and Local Authority attitudes to community engagement. Evidence about social capital could not be implied, however. The study was repeated in Wales (Gronow et al., 2014), and this described an anticipated increase in the degree of community involvement in the care of assets including woodlands, through vehicles such as 'Friends of' Groups and support groups undertaking a range of place-keeping activities. Around 80% of Local Authority respondents reported that communities were currently involved in the management of their woodlands, and 50% said that they have agreements in place with community groups or social enterprises. However, there was no explicit evidence of social impacts included in the research.

When considering the potential negative impacts of developing social capital, there is a documented example from Wales. An existing community group with strong bonding social capital, developed further as part of a woodland project, and this set those involved apart from the rest of the community who then felt they had no real local legitimacy in their decision making for the woodland. This led not only to conflict about the management of the woodland, but also disruption within the community through overt conflict (Ben Reynolds Consulting, 2008).

4.1.4   Evidence from elsewhere

Researching urban communities in England, Jorgensen et al. (2007) showed that action focused on collective care of the environment can lead to communal place identify, which could be interpreted as a form of social capital. This contrasted with individual interaction with greenspace, including trees and woodlands, which was considered more as being place attachment.

Van der Jagt et al., (2015) reported on three Scottish case studies and documented what the volunteers and community-based organisations recognised as the indirect benefits of the community woodland activities they were involved with. These included: providing environmental education, stimulating the use of local, sustainable forest products, promoting sustainable living, and improving access to natural spaces. In some cases, the social learning involved was shown to change the perceptions, attitudes and livelihoods of local people.

Looking at the potential negative dimensions of social capital development, Holstead et al. (2018), using evidence from the UK, showed that outsourcing paid work to unpaid volunteers produces new social inequalities. It reduces both the potential for paid employment in the green economy and narrows participation to those who have the capacity and resources.

The international evidence suggests that social capital built through engagement with woods and forests can lead to:

- Increases in public goods such as improved environmental quality

- Decrease in anti-social behaviour within neighbourhoods and specific locales

- Building economic opportunity, including though learning and the improvement of skills

- Empowerment – i.e. better self-governance and ability to influence the governance of woodlands and other greenspaces or neighbourhood places.

Teitelbaum (2014) recognised that there are very few evaluative studies of community forestry, but those which exist tend to report under achievement of expected social and ecological benefits. Looking at the evaluative evidence from Canada shows that community forestry (i.e. forestry where communities/community organisations have tenure to manage and receive benefits), enhances social networking and collaboration, but finding evidence for improved social cohesion and social inclusion is more challenging.

According to another study conducted in Canada (Egunyu and Reed, 2015) social learning in collaborative forestry, is a pre-requisite for the generation of benefits and impacts. They show that social learning and the associated outcomes are differentiated by social characteristics, including gender. However, they also remark that learning about forestry and business management, improved skills in volunteer management, managing organisations, advocacy, running events, networking and building community inclusion.

Meanwhile, Robson et al. (2020) reviewed the evidence for nine countries to show that social capital development around community forestry in predominantly rural locations was beneficial for some, but certain groups such as young people, did not engage, as they did not see their futures connected with land-based activities or community action.

Compton and Beeton, (2012), in their examination of land care groups in Australia, mapped social capital along different dimensions and found two distinct groups, namely "inactive dependents" and "active independents". These groups differed in collective empowerment and "degree of social capital". The key difference between the two groups was the ability of the active independents to innovate and maintain their development trajectory and effective governance capacity.

4.1.5   Is there evidence suggesting effective methods of building social capital in woodland/ forestry related initiatives?

A host of woodland and tree focused activities and approaches, including forestry projects, nature walks, tree inventory and monitoring events, citizen science projects, and community volunteering, have been shown to cultivate social capital, trust, and networks (Butt et al., 2021; Lawrence and Ambrose-Oji, 2015; Wavehill Consulting, 2010b). Many studies use single case analyses, or point-in-time studies which may ignore factors that only indirectly influence the success of community initiatives (Baynes et al., 2015). The Forest Research community woodland group case studies[6] provide a history of their development and description of how community involvement was built. They were designed to be longitudinal so a percentage of them cover the development of community engagement, and attempt to track outcomes and benefits accrued over a few years.

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[6] https://llaisygoedwig.org.uk/resources/case-studies/

These studies showed variation in development depending on context, with success factors relating to transparency of decision making, including a range of community viewpoints, negotiating community differences to reach consensus, maintaining an active volunteer base, building partnerships or finding sources of income to maintain community involvement and activities. Similar conclusions were reached by Ludvig et al. (2018) in their analysis of the success factors and lessons learned relating to two Wales community-based social innovation case studies.

4.2 DRIVERS FOR AND BARRIERS TO PUBLIC ENGAGEMENT WITH WOODLANDS

As has already been demonstrated, there are many and varied ways in which individuals and communities may engage with woodlands, and social benefits may accrue if they do so. It is therefore useful to have an understanding of what might motivate people to engage with woodlands, or indeed what might act as barriers to that engagement.

4.2.1 Motivations for visiting woodlands

At the level of the individual, in the Wales Outdoor Recreation Survey (National Resources Wales, 2014) a key area of interest was the motivations for visiting the outdoors, including woodlands. The most frequently mentioned motivations in 2014 were health or exercise (23% of visits) and/or walking the dog (22% of visits), followed by visits for pleasure or enjoyment (15% of visits) and for fresh air/ pleasant weather (14% of visits). The National Survey for Wales 2016-17 (Natural Resources Wales, 2018) reported similar findings, with fresh air (43%) and health/exercise (43%) being the most common reasons given for respondents' last visit to the outdoors. There were gender differences in people's motivations, with men more likely to visit the outdoors to participate in a specific hobby (16% of men compared to only 9% of women). In contrast, women were more likely to want to spend time with family, or to entertain children. (Natural Resources Wales, 2018). Differences in the reasons people gave for visiting specific places were also noted, with people going to woodlands being more likely to want to visit to walk the dog.

The Forestry Commission/Forest Research has conducted biennial surveys of public attitudes to forestry and forestry-related issues since 1995. These surveys are used to inform and monitor policy development. The Public Opinion of Forestry Survey Wales (2019) asked respondents who had visited woodlands (77%) what they thought was important to them in choosing to visit the woodland they had been to most recently. The most important factors identified in the 2019 survey were the woodlands proximity - "It is in close/easy reach" (64% of respondents who had visited woodland), "Peace and quiet" (62%), and "Attractive scenery" (59%) (Table 4.3).

Table 4.3: Reasons for choosing to visit woodlands

	Percent of respondents		
	2015	**2017**	**2019**
It is in close/easy reach	55	59	64
Peace and quiet	52	60	62
Attractive scenery	51	64	59
Good for exercise	46	53	53
A good place to unwind/de-stress	41	49	51
Wildlife	44	57	49
Dogs are welcome	43	44	47
Safe environment	36	45	43
No entrance charge	36	38	41
Clear and accessible tracks and paths	34	42	39
Knowing that visitors are welcome there	28	37	35
Good facilities (e.g. toilets, café)	..	..	27
Knowing you can access gates/stiles with your group	22	23	21
Clear signage - both welcoming and directional	19	20	17
Opportunities for learning	..	..	15
A variety of activities	11	18	14
Opportunity to collect woodland produce (including firewood)	4	8	7
Other	1	0	0
None of the above	1	0	0

Source: Public Opinion of Forestry Surveys Wales

4.2.2 Motivations for wider engagement with woodlands

In the Cydcoed programme (Owen et al., 2008), the concentration on forests, trees and woods was seen as valuable, as they provided a focus for projects. Qualitative research suggested that this acted as a catalyst for involvement: many individuals stated that they would not have been so keen to become involved in community action had projects not taken place in and around trees, woods and forests. The evaluation of the programme found that the remit and funding to manage and develop projects was empowering, hence motivating people to be engaged, and helped to develop stronger ties within communities. Partnership working was also found to be an important part of the success of the projects (Owen et al., 2008).

A study by Muirhead (2012), supported by Forestry Commission Scotland (now Scottish Forestry), involved five environmental volunteering groups across Scotland, and explored the linkages between wellbeing, landscape and environmental volunteering. The research found that motivations expressed by environmental volunteers were often centralised in the ethics that supported the volunteer work. There was a sense of stewardship and responsibility for the environment, with the volunteers seeing themselves as an active part of protecting future generations, as well as the future of the environment.

Another study in Scotland (O'Brien et al. 2008) provided an understanding of the motivations for, barriers to and benefits of environmental volunteering for the volunteers and organisations involved. The research found that, as well as environmental reasons, the volunteers were also motivated by the personal benefits they gained from the outdoor opportunities, and the social nature of the environmental activities. Volunteers were able to learn new skills and meet others whilst also improving their overall health, wellbeing, and quality of life. Muirhead (2012) also found evidence of volunteers linking practical goals to a spiritual awareness, both in relation to the environment and to their own physical and mental wellbeing. Environmental volunteering was shown to offer a wide range of opportunities to

suit people with diverse interests and abilities (O'Brien et al., 2008). The Observatree citizen science project uses trained volunteers to carry out surveys for tree pests and diseases, and to assist with processing and verifying tree health incident reports. An evaluation of the project (Hall et al., 2017) identified a range of motivations for involvement, which included wanting to do something useful, worthwhile, rewarding, and of value. Social motivations were identified as meeting, talking to, engaging with and working with other people and environmental motivations included an interest in conservation, protection of the environment and spending time outdoors.

4.2.3   Barriers to visiting and engaging with woodlands

The Wales Outdoor Recreation Survey (National Resources Wales, 2014) survey asked respondents to give the reason for not participating in outdoor recreation activities as much as they would have liked in the last 12 months. Being too busy/ a lack of time was the most cited barrier (34%). Other main barriers included: bad/poor weather (14%), disability (4%) and other health reasons (7%). These findings were also reflected in the National Survey for Wales 2016-17 (Natural Resources Wales, 2018) with the most common barrier to visiting the outdoors also being a perceived lack of free time (28%), physical disability (24%), other health reasons (19%) and old age (19%). 'For older people (over 65), the main barriers were old age (41%) and physical disability (34%). For younger adults (16-44) the main barrier was lack of time (57%). Equally, women were more likely to cite physical disability and old age as their main barrier, whilst for men it was lack of time. For respondents who reported not having made a visit to the outdoors in the last four weeks, the most common reason (46%) was bad weather' (National Resources Wales, 2014, p5).

Morris et al. (2011) drew on 20 studies to explore some of the barriers to accessing woodlands and forests in Britain. A typology of barriers was identified covering: physical and structural barriers; on-site barriers (e.g. access points, signage, and facilities); off-site barriers (e.g. lack of information and transport); and socio-cultural and personal barriers. The study highlighted the complexity of issues that might impact on people's engagement with woodlands including safety concerns for women on their own, concerns from some urban respondents about graffiti and litter, and concerns from some adults about getting lost. For older people (over sixty) there could be issues with physical mobility; and lack of appropriate information on site access was an issue for disabled respondents. Visiting a woodland was not the norm for some people from ethnic minority backgrounds leading to a lack of awareness of local woodlands and a lack of confidence or cultural affinity for woodlands.

The Public Opinion of Forestry Survey Wales (2019) asked respondents who had not visited woodland in the last 12 months to state their main reasons for not doing so. The most commonly stated reasons for not visiting were that the respondents had personal mobility reasons (other than not having a car) (35% in 2019) and were too busy/did not have enough time (28%) (Figure 4.1).
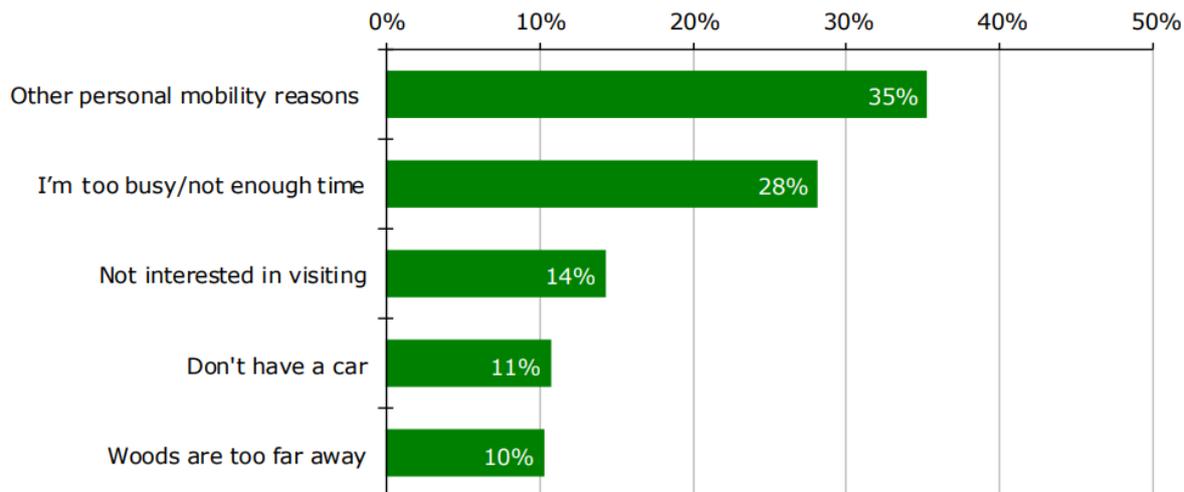
Source: Public Opinion of Forestry Survey Wales 2019

Respondents were also asked whether they had any long-term physical or mental health conditions or illnesses (i.e. lasting or expecting to last 12 months or more) and, if so, whether this had affected their use of woodlands, forests or greenspaces. Around one third (31%) of respondents reported that they had a long-term physical or mental health condition or illness. Of those with a condition/illness, under one half (44%) said that their condition affected their use of woodlands/forests or other greenspaces. Respondents whose condition or illness affected their use of woodlands/forests or other green spaces were then asked to identify how their visit was affected (Figure 4.3). The most commonly identified factors were a lack of suitable paths around the woodland/forest or other green space (27%), a lack of accessible facilities (14%) and a lack of public transport (12%) (Forest Research, 2019).
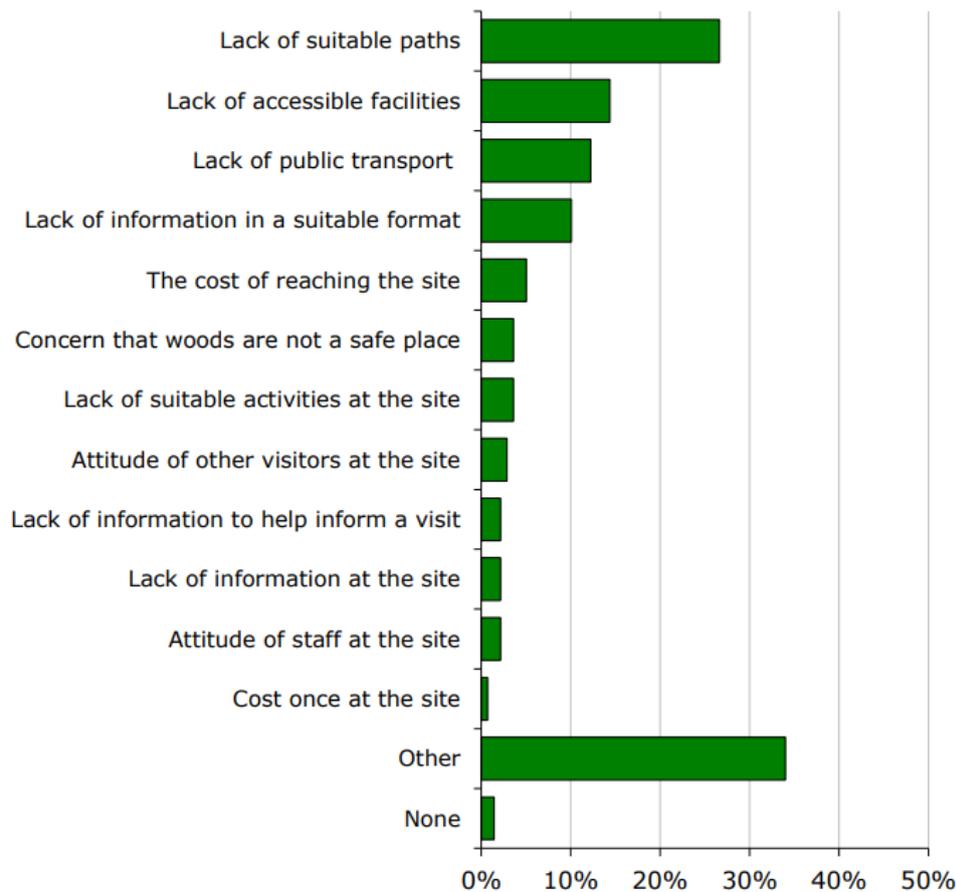
Figure 4.2:
How condition/ illness affects use of woodlands/ forests or other green spaces

Source: Public Opinion of Forestry Survey Wales 2019

As noted above, another way in which people may engage with woodlands (other than visiting for leisure purposes) is through conservation and environmental volunteering. Practical barriers to environmental volunteering identified by O'Brien et al. (2008) included lack of information about volunteering opportunities, cost, and transport issues. Confidence was also an issue, with volunteers lacking the confidence to follow up on information or to be proactive and get involved.

(Also see Section 3.3 – woodlands contribution to tackling health inequalities and Section 7 – woodlands negative impacts on society).

4.3 CLOSENESS TO POPULATIONS

One of the factors that has been shown to influence the extent to which people use, visit and engage with woodlands is the closeness to populations and the accessibility of those woodlands (which differs between individuals and social groups).

The Office for National Statistics (2019) state that for the public to enjoy outdoor spaces they need to be within a reasonable distance of their homes, and accessible. Accessibility of green spaces is therefore seen as important to achieving some of the social benefits through outdoor recreation. The Ordnance Survey Green Space Map provides information about the number of access points available for green space in urban areas in Great Britain. This provides a basic indicator of the accessibility of green spaces within the urban environment. The part of the UK with the greatest number of access points to urban green space is Wales,

with the data indicating an average of 2.5 access points per hectare of functional green space (defined as any green space that has a specific function in its use, for example, public parks or gardens, playing fields, golf courses, allotments and so on), however the reliability of this measure is contested. These spaces contain natural land cover, and can also include some blue space, for example, a park that has a lake within it). In Wales, 69.9% of functional green space is publicly accessible, higher than England and Scotland with 68.4% and 64.2% respectively[7].

In the British Woodlands Survey in 2017 (Hemery et al., 2018) woodland owners and managers were asked about the provision of public access to their woodlands: 66% of respondents who owned or managed woodland provided access across their land due to statutory access, 48% provided permissive paths, and 72% provided access by arrangement with users (many respondents provide different types of access in their woodlands). A large minority did not provide any access (34%). A total of 1,630 people responded to the survey, 186 of whom were in Wales.

The Woodland Trust (Cheng and Tong, 2017) believe that in terms of provision of natural green spaces, woods should be seen as the optimal habitat. As such, they have developed a standard for woodland (focusing on towns and cities), which should complement other green space access standards (e.g. the accessible natural greenspace standard). The Woodland Trust's Woodland Access Standard aspires that:

- No person should live more than 500 m from at least one area of accessible woodland of no more than 2 ha in size; and

- There should also be at least one area of accessible woodland of no less than 20 ha within 4 km (8km round trip) of people's homes.

4.3.1   How accessible are woodlands in Wales?

The 'Space for People' report looked at accessible woodland between 2012 and 2016 and showed a slight decrease in accessible woodland in Wales from just over 121K hectares (ha) to just over 120K ha, a reduction of 0.7% (Woodland Trust, 2017). It should be noted this work looked at open and permissible access and did not include woodland with public rights of way only. In terms of these accessible woodlands, in 2016, nearly 24% of the Welsh population had access to a 2ha wood within 500 metres, while nearly 81% had access to a 20ha within 4km. By 2020, these respective figures had reduced to 18% and almost 74% (Reid et al., 2021). The 2017 report highlighted that if existing woodlands were made accessible or new woodland created there could be a large increase in the percentage of the population having access to 2ha woods within 500m or access to 20ha within 4km; 44% and 32% respectively (Woodland Trust, 2017) (table 4.4).

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[7] https://www.ons.gov.uk/economy/environmentalaccounts/bulletins/uknaturalcapital/urbanaccounts

Table 4.4. *Shows provision of woodland access and population at local authority level in Wales.*

Wales	Accessible woods		Inaccessible woods		Woodland creation	
Local authority	% of population with access to a 2ha+wood within 500m	% of population with access to a 20ha+ wood within 4km	% extra population with access to a 2ha+ wood within 500m if existing woods opened	% extra population with access to a 20ha+ wood within 4km if existing woods opened	% population requiring new woodland to be able to access a 2ha+ wood within 500m	% population requiring new woodland to be able to access a 20ha+ wood within 4km
Abertawe - Swansea	24.6	84	44.1	15.8	31.3	0.3
Blaenau Gwent - Blaenau Gwent	43.2	99.4	36.1	0.6	20.7	0
Bro Morgannwg - the Vale of Glamorgan	8.3	83.3	30.7	13.1	61.1	3.5
Caerdydd - Cardiff	27.7	71.7	27.3	25.7	45	2.5
Caerffili - Caerphilly	25.8	99.7	59.6	0.3	14.7	0
Casnewydd - Newport	31.7	94.8	32.5	3.2	35.8	2
Castell-nedd Port Talbot - Neath Port Talbot	29.2	97.7	50.1	2.3	20.7	0
Conwy - Conwy	18.6	78.5	36.8	18.7	44.6	2.7
Gwynedd - Gwynedd	20.5	62.1	48.2	35.4	31.3	2.5
Merthyr Tudful - Merthyr Tydfil	35.2	94.1	48.7	5.9	16.1	0
Pen-y-bont ar Ogwr - Bridgend	20.7	68.2	47.8	28.5	31.5	3.3
Powys - Powys	16.7	64.5	55.4	35	27.9	0.5
Rhondda Cynon Taf – Rhondda Cynon Taf	35.6	99.8	52.3	0.2	12.1	0
Sir Benfro – Pembrokeshire	25.7	44.9	48.7	48.9	25.6	6.2
Sir Ceredigion - Ceredigion	25.7	64.6	45.5	31.6	28.8	3.8
Sir Ddinbych – Denbighshire	17.6	76.7	31.2	23.2	51.2	0
Sir Fynwy – Monmouthshire	21.8	97.5	49.1	1.8	29.1	0.7
Sir Gaerfyrddin - Carmarthenshire	11.3	70	56.3	29.2	32.4	0.8
Sir y Fflint – Flintshire	20	72.7	37.8	26.6	42.2	0.7
Sir Ynys Mon – isle of Anglesey	11.3	56.6	24.2	20.5	64.6	22.9
Tor-faen – Torfaen	26.6	97	60	3	13.4	0
Wrecsam - Wrexham	16.3	90.9	49.9	7.6	33.7	1.5

Source: Woodland Trust. 2017. Space for people: targeting action for woodland access. Woodland Trust, Grantham, p28-29.

4.3.2   How far do people travel to access woodland and greenspace?

The National Survey for Wales 2016-17: Outdoor Recreation (Natural Resources Wales, 2018) asked respondents about their most recent visit to the outdoors. 47% of adults in Wales had travelled less than a mile from home, with 30% of visits being to a local park. "*This suggests that access to 'doorstep opportunities' is an important factor for engagement in outdoor recreation for many people*" (Natural Resources Wales, 2018, p3). 14% of these most recent visits were to woodlands and forests.   Natural Resources Wales (2018) also stated that those living in urban areas were more likely to visit their local park, whilst people living in rural areas were more likely to go to woodlands, hills, mountains, moors, or farmland.

The Public Opinion of Forestry Survey Wales conducted in 2019 included results about the location of woodland visited on respondent's most recent visit, where they had visited woodland in the last 12 months. 51% of respondents to the 2019 survey who had visited woodland or forests in the last 12 months had visited woodlands in the countryside (51%) on their most recent visit and 48% had visited woodlands in and around towns (Figure 4.3). When compared to previous surveys, a higher proportion of 2019 respondents indicated their latest visit was to woodland in and around town (48%), suggesting that proximity to populations is becoming more important. There was a corresponding decrease in the proportion that had visited woodlands in the countryside.
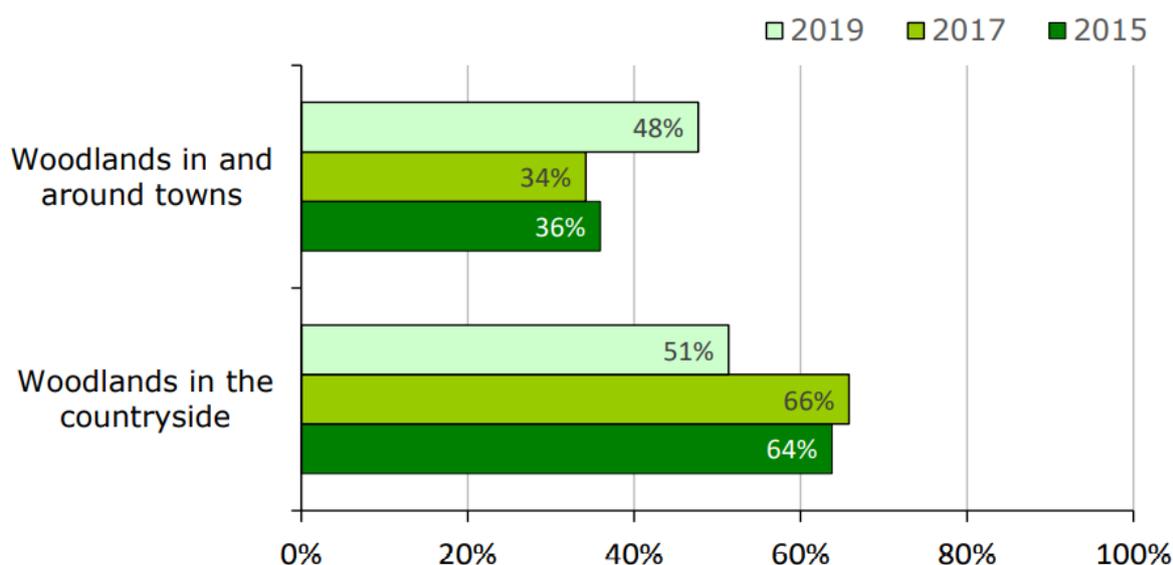
Figure 4.3: Location of woodland visited
Source: Public Opinion of Forestry Survey Wales 2019

4.3.3   How does proximity to greenspace influence activity & health?

The Parliamentary Office of Science and Technology (2016) asked whether proximity to green space, quality and accessibility influence physical activity. Their review showed that those living closer to green space were more likely to use it, and more frequently. A study in the UK also found that people who live within 500 metres of accessible green space are 24% more likely to meet 30 minutes of exercise levels of physical activity (Natural England, 2011) which correlated with studies outside the UK suggesting that people living closer to good-quality green space are more likely to have higher levels of physical activity (Lee & Moudon, 2008; Cohen et al., 2006). However, there has been no agreement in regional studies and some researchers suggest that it is 'perceived' access rather than measured proximity that influences activity levels (Hillsdon et al., 2006).

Cox et al. (2017) state that nearby nature offers potential as an easily accessible and cost-effective approach to illness prevention. Their study in southern England demonstrated that nature close to home was associated with quantifiable benefits to population health. Greater frequency and duration of time spent in nearby nature led to measurably better mental health, social health, positive physical behaviour, and nature orientation. People living in greener neighbourhoods showed lower levels of depression and greater nature orientation. No relationship was found with self-reported physical health (Cox et al., 2017).

A study conducted in Perth, Australia, by Carter and Horwitz (2014) also showed that proximity to nearby play and social spaces was associated with better mental health, perhaps through increased opportunity for social interaction. Retention of green space and bushland was associated with better physical function, possibly because of size and diversity of landscape and increased opportunity to be physically active for longer in a larger space.

A study by Akpinar (2017) focusing on children, explored urban green spaces, in the city of Aydin, Turkey, and associations with distance, physical activity, screen time, general health, and being overweight. The findings showed that distance to urban green spaces was important for children's physical activity, screen time, and general health, whereas no relationship was found with children being overweight. Travelling less distance to urban green space significantly increased the frequency of physical activity for both boys and girls. As regards age groups, nearest distance to urban green space was related to a higher frequency of physical activity in both 1-6 and 7-12 year olds, whereas nearest distance to urban green space was associated with longer duration of physical activity and less screen time for children aged 7–12 years only, who may be more independently mobile. The study showed no significant findings for children aged 13-18 years, and the researcher suggests barriers (such as inadequate design and urban green spaces being less attractive for teenagers) and "*push and pull factors (screen-based devices, parental concerns about stranger danger and traffic safety, the popularity of and preference for teenagers' online communication with peers) may be important*" (Akpinar, 2017, p71).   Also focusing on children, Wolsink (2016) asked how the establishment of environmental education practices is affected by proximity to green spaces. The study in all secondary schools in Amsterdam found that for fieldwork excursions proximity to green spaces was crucial for establishing a pattern of outdoor environmental education. Once established it shaped teachers' attitudes on excursions and resulted in more fieldwork excursions to other destinations.   Wolsink (2016) suggested close proximity (making it easier to organise the visit) seemed to be more important than the environmental quality of the green space.

(Also see Section 3 – Health)

Overall, being in close proximity to greenspace and woodlands can provide a range of social benefits, for example, for health, well-being, children's education, and physical activity levels. However, this review has found little evidence from Wales about this.

4.4 PUBLIC PREFERENCE FOR WOODLAND TYPE

While location and accessibility may influence the extent to which people engage with woodlands, there may be other factors, including the type and characteristics of woodland.

The Public Opinion of Forestry Survey Wales includes results about what respondents would prefer to see after trees were felled in terms of types of trees/woodland and approach to re-planting. More than half (56%) preferred to see a mix of conifers and broadleaves, with around one third (32%) preferring just broadleaves (Table 4.5).

Table 4.5: Preferred trees/ woodland type following felling

	Percentage of respondents	
	2017	**2019**
A mix of conifers and broadleaves	57	56
Broadleaves (e.g. oak, beech)	33	32
Conifers (e.g. scots pine, juniper, yew)	3	4
None - Don't want to see re-planting	3	2
Don't know	3	6

Source: Public Opinion of Forestry Survey Wales, 2017 & 2019.

These results are reflected in a study by Upton et al. (2012) conducted in Ireland, which showed that mixed forests were most preferred by the public, followed by broadleaf in comparison to conifer forests. Upton et al. (2012) recognised other studies which also supported these findings, e.g. Mill et al. (2007) and Nielsen et al. (2007). Several studies found that mixed forests were preferred by the public over monocultures, with higher preferences for biodiversity, landscape and carbon sequestration (Upton et al., 2012; Grilli et al., 2016).

A literature review by Edwards (2006), part of an EU-funded Integrated Project EFORWOOD, explored the Social and Cultural Values (SCVs) associated with European forests. One of the nine SCV themes identified was landscape and aesthetics, and the kinds of forest that maximises landscape benefits was shown to be 'natural looking' forest rather than uniform commercial plantations (Entec 1997, cited by Edwards, 2006). A landscape with a patch-work of woods and fields was also more valued than complete forest cover' (Willis, 2003, cited by Edwards, 2006).

Another part of the same study by Edwards et al. (2010), used a literature review and a Delphi Survey (with panels of experts from Great Britain, the Nordic Region, Central Europe, and Iberia) to derive scores for the recreational value of 240 forest stand types across Europe. As part of this study, in each region, 60 forest stand types were defined according to three tree species types (conifer, broadleaved, and mixed). The findings suggested that trees species composition was not seen as important in Europe. The criticism of non-native conifers, and perceived preferences for broadleaves across Europe, was understood to be more due to the intensive management of conifers (characterised by dense even-aged monocultures and short rotation lengths) rather than the choice of tree species.

Edwards et al. (2010) acknowledge that these findings may hide significant differences in preferences between individuals and social groups, between people pursuing different recreational activities, and between geographical regions with their contrasting cultural landscapes (Edwards et al., 2010). This is supported by Filyushkina et al. (2017) who asked research participants about their ideal recreational forest. The findings showed that mixed tree species were preferred compared to monoculture. Uneven-aged stands were preferred over even-aged ones. Variation between stands was found to contribute positively to recreational value, and in some instances, and this was seen to outweigh the contribution of variation within a stand (Filyushkina et al., 2017). O'Brien et al. (2012) in a study of peri-urban woodlands for health and wellbeing in England found participants favoured variety and complexity in woodland landscapes. Other studies have also identified that broadleaved or deciduous species are typically preferred to coniferous ones, though mixed woodlands are preferred overall (Coles and Bussey, 2000; Gerstenberg and Hofman, 2016).

Edwards et al. (2010) also explored the relationship and contribution of 12 key silvicultural attributes to the recreational value of forests in Europe. For each attribute, participants were asked to state what they believed to be the nature of the relationship, and relative

contribution, of each attribute to the overall recreational value of forests. The findings generally supported the conclusions reported in other reviews, e.g. Ribe (1989) and Gundersen and Frivold (2008). They indicated clearly that 'size of trees' was unanimously considered one of the most important attributes, along with attributes that reflect level of intervention such as 'size of clear-cuts', 'residue from thinning and harvesting' (tree stumps, branches, etc.) and 'visual penetration'. The results also highlighted that the public in most of Europe prefer a degree of intervention to 'tidy up' the forest, creating a state of 'managed naturalness' (Edwards et al., 2010). The researchers suggest that the preference to 'tidy up' the forest is partly for aesthetic reasons but also to make them appear safer and more accessible. Neilsen and Jensen (2007; cited by Davies et al., 2017) also suggest that woodlands should be open with well-spaced trees in order to improve visibility and thus feelings of security (See Section 7.7 – poor maintenance). In Great Britain the 'number of tree species' was shown to be unimportant, whereas 'variation in tree size' was rated the highest importance. The researchers suggest this may reflect the widespread negative perception of intensive even-aged plantations of Sitka spruce, the dominant silvicultural regime in upland areas of Great Britain. Ryan and Simson (2002; cited by Davies et al., 2017) also noted that perceived naturalness can enhance the visual appeal of a woodland, and suggest that native species may be considered more representative of an area and thus contribute to sense of place and community spirit. Nielsen and Jensen (2007; cited by Davies et al., 2017) also found that light, open woods with widely spaced large trees provided better recreational opportunities than dense belts of small trees or woodlands with understorey.

Although Irvine and Herrett (2018) recognise that research has highlighted a public preference for woodlands that are light and airy, structurally heterogeneous and / or comprise diverse/iconic species (e.g. oak or Scots pine woodlands), they note that there is no evidence that these features in themselves enable specific cultural ecosystem services (i.e. recreation, aesthetics, sense of place and spiritual aspects). What they do find is that the meanings given to woodlands, associated with past experiences and childhood visits, are extremely important for recreational use and emotional attachment to urban woodlands (see Section 5 – socio-cultural links to woodlands).

4.5 PUBLIC OPINION ON LANDSCAPE CHANGE TO WOODLANDS AND INDIVIDUAL TREES IN URBAN AREAS

For the National Forest for Wales design, it is important to have some understanding of public opinion of landscape change and woodlands, and also their views of trees in urban areas. This section draws on the limited evidence available about these two aspects.

4.5.1 Public opinion on landscape change to woodlands

With regard to opinions about landscape change, the Public Opinion of Forestry survey, Wales, found that approximately two fifths (41%) of respondents would prefer to see a gradual restoration to a natural type of woodland following woodland felling, and around one quarter (27%) preferred quick replanting. A further 27% stated that they did not have a preference (Table 4.6).

Table 4.6: *Preferred rate of re-planting*

	Percentage of respondents	
	2017	**2019**
A gradual restoration to a natural type of woodland	40	41
No preference	29	27
Quick replanting	26	27
None- Don't want to see re-planting	2	2
Don't know	2	3

Source: Public Opinion of Forestry Survey Wales, 2017 & 2019.

In a study from Scotland Nijnik and Mather (2008) analysed public preferences concerning woodland development in rural landscapes, which integrated ecological, socio-economic and aesthetic criteria. The results of their analysis showed public support for a policy promoting tree-planting, and in particular support for the expansion of native woodlands. These were viewed as having the potential to offer a wide range of benefits to people, the economy, and the environment. Six groups of attitudes towards the policy of afforesting rural landscapes in Scotland were distinguished. These were labelled as: (1) practitioners (2) idealistic visualists (3) radical environmentalists (4) realists (5) utilitarian visualists and (6) progressive environmentalists.

All groups of public opinion placed a strong emphasis on regeneration of woodlands, with the difference that the respondents in groups 3 ("Radical Environmentalists") prioritised native woodlands over conifer plantations, whilst the others did not make such a strong distinction between these types of forest. One of the main reasons for public support for the woodland expansion policy, voiced by groups 1 and 6, was the creation of new jobs in remote rural areas and the provision of employment opportunities through the development of tourism and recreation. The second major reason as stated by groups 2 and 5, was that they recognised the necessity of improving rural landscapes through multi-functional forestry development (Nijnik and Mather, 2008). As this evidence is specific to Scotland it would be of value to conduct similar attitudinal research in Wales.

4.5.2 Public opinions of trees in urban areas (evidence from Wales)

The Public Opinion of Forestry Survey Wales introduced questions relating to urban trees in 2017. The questions include street trees, but also have wider coverage that includes trees and woodlands in other urban areas. Respondents to the 2019 survey were first asked about priorities for targeting public resources for looking after urban trees and woods. Over one half (55%) of respondents placed trees in and around public gardens as either most or second most important, with woodlands around towns with public access coming most or second most important for one third (33%) of respondents (Figure 4.5). Street trees and those on roundabouts were ranked least important by around one quarter (24%) of respondents.
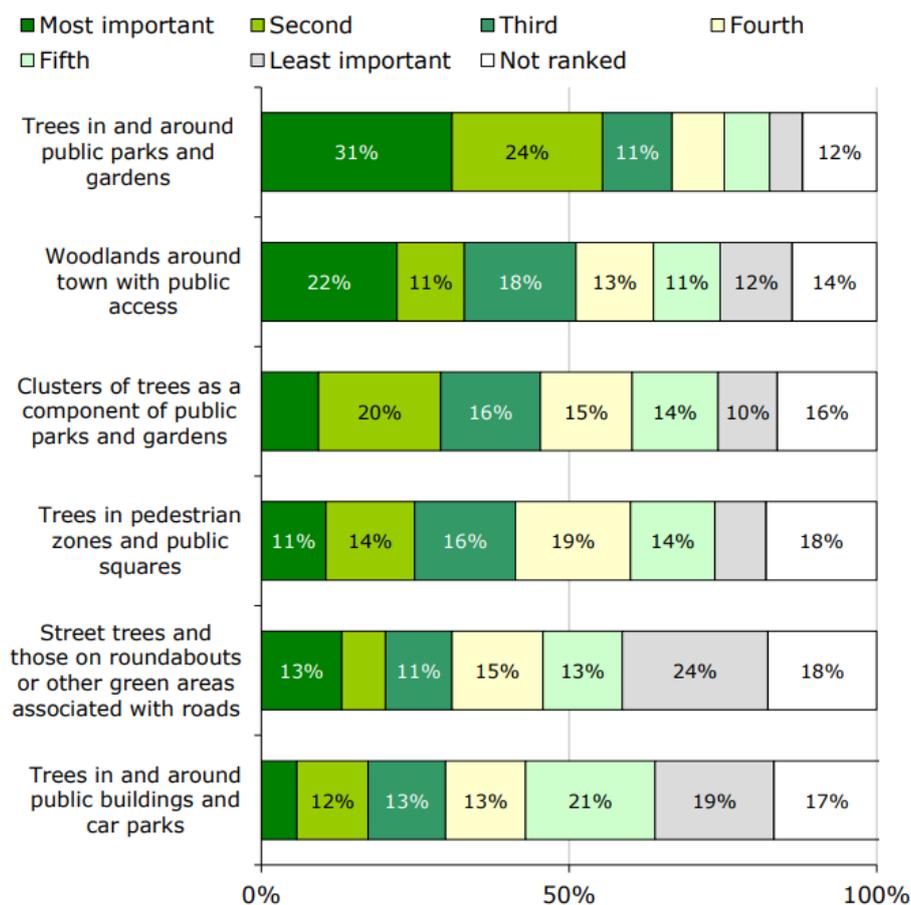
Figure 4.4: *Priorities for spending of public resources on urban trees*

Source: Public Opinion of Forestry Survey Wales 2019

More recently, in a study by Forest Research (2021), 600 respondents from Wales completed a questionnaire about public perceptions of urban trees. When asked "*Where do you feel trees make the most contribution to your neighbourhood or town/city?*", 31.5% ranked 'Urban woodlands' as 10 (using a scale of 1-10 where 1 is least positive); 27.5% ranked 'Parks and recreation/sports grounds open to the public' as 10.

In the Public Opinion of Forestry Survey for Wales, respondents were also asked if they would be prepared to take action in support of urban trees. A majority of respondents in 2019 indicated they would be prepared to raise concerns with the Local Authority if they noticed a problem with trees (69%), and 62% of respondents would be prepared to plant and tend trees in their communal area (Table 4.7). These data suggest a high level of willingness to actively engage in the management of trees in their local urban area.

Table 4.7: *Willingness to take action in support of urban trees*

	Percentage of respondents	
	2017	**2019**
Raising concerns with the Local Authority if you notice a problem with trees	67	69
Planting and tending trees in your garden or communal outside area	60	62
Watering newly planted trees in public areas during periods of dry weather	49	50
Monitoring the health and condition of public trees	48	50
Participating in community planting programmes	48	46
Accepting higher council taxes which will be used for community tree programmes	26	23

Source: Public Opinion of Forestry Survey Wales.

However, the Forest Research (2021) study on perceptions of urban trees revealed a lower level of willingness to engage in activities by Welsh respondents. When asked "what tree related activities are you interested in?" 28% said 'Plant own tree'; 15% selected 'Joining a community group to care for trees and woodland'; 9% said 'Joining ad hoc events and campaigns related to trees'; and 22% said 'Volunteering to plant trees in public places'.

In that same study by Forest Research (2021), two focus groups were held in Wales. Findings from these showed that participants appreciated urban trees for their benefits to nature and the environment, as well as places to go for a walk, spend time with children, and meet up with friends and family. The questionnaire from the project also asked respondents to rank the disbenefits of urban trees (using a sliding scale of 1-10, with 1 being the least important and 10 the most important). Results from Wales showed that 'damage from tree roots' received the greatest percentage of responses ranking from 6-10. Disbenefits are considered in greater detail in section 7.

Davies et al. (2017) reviewed literature on the delivery of ecosystem services by urban forests. The key urban forest parameters that are reported to improve nature and landscape connections were identified as: scale and management, urban forest structure, location and proximity to people, and land use and ownership. Literature identified under the 'scale and management' category included: individual trees, especially veteran ones, can provide great character and sense of history to a place (Scottish Government, 2014b); individual trees have a positive effect on the perceived aesthetics of urban squares, enhancing city image, duration of visit and the willingness to revisit (Raškovi´c and Decker, 2015) and lines or clusters of trees can provide aesthetic enhancements to streets, civic spaces and parks (Coles et al., 2013). Under the 'urban forest structure' category: large, mature trees were found to be generally more aesthetically pleasing than small, immature ones (Tyrväinen et al., 2005); crown size and density were both found to be positively related to people's preferences, with globe-shaped crowns particularly preferred (Gerstenberg and Hofman, 2016); woodlands with greater structural complexity (more canopy layers and different species) were also preferred (Coles and Bussey, 2000).

Other findings by Tyrväinen et al. (2003; 2005), identified by Davies et al. (2017), showed that clear views with low-density understorey vegetation were associated with increased pleasure and were preferred by visitors, and visual variation (i.e. combining mature stands with smaller trees, as well as the presence of other habitats such as water) was more aesthetically pleasing. Tyrväinen et al. (2005) also noted that people are more likely to congregate in attractive woodland settings, and therefore tall, mature trees are preferred. Relating to 'location and proximity to people' research was identified which stated that trees and woodlands must be visible and in fairly close proximity for the service of aesthetic enhancement to be provided, as evidenced by the effect of green views on property prices (Jim & Chen, 2006).

Finally, Davies et al. (2017) identified literature under 'land use and ownership' which showed that a view of a (publicly inaccessible) greenspace can be as effective for mental well-being as having access (Grahn and Stigsdotter, 2003).

A project in Wales, overseen by Keep Wales Tidy and funded by the WG National Forest Programme as a demonstrator project, which is changing the woodland landscape in a small way in urban areas is 'Tiny Forests'. Tiny Forests are native woodlands approximately the size of a tennis court, with four different tree layers to provide varied structure. They are planted with the help of local volunteers using the Miyawaki technique, consisting of 1000 native trees. The forests include a path and an outdoor classroom. Areas of multiple deprivation have been targeted for the project, and case studies include Kinmel Bay, Conwy (Conwy CBC), Cardiff Bay barrage (Cardiff Harbour Authority - Cardiff CC), Pencoedtre Park,

Barry (Vale of Glamorgan CBC) and Caernarfon, Gwynedd (Ysgol Pendalar). Keep Wales Tidy have reported the sites being supported by local communities and used by dog walkers, schools, and residents socially and for exercise, as well as a thoroughfare between different areas of the towns. Members of the community in Caernarfon made the following comments about their Tiny Forest (Pers comms, Keep Wales Tidy):

"I was glad of the opportunity to contribute to such a worthwhile project – creating a lovely outdoor classroom that will be surrounded by trees in just a few years' time. I really enjoy doing physical work outdoors, in the company of others. I always feel better at the end of the day - both physically and mentally." Helen, volunteer

"I'm really looking forward to seeing the trees grow. The pupils are going to enjoy being in a forest only 20 feet from the school. It's exciting!" - teaching assistant, Ysgol Pendalar

4.5.3 Public opinions of trees in urban areas (evidence from elsewhere)

Davies et al. (2017) reviewed literature on the delivery of ecosystem services by urban forests. The key urban forest parameters that are reported to improve nature and landscape connections were identified as: scale and management, urban forest structure, location and proximity to people, and land use and ownership. Under the 'scale and management' category they found that individual trees, especially veteran ones, provided character and added a sense of history to a place (Scottish Government, 2014b); individual trees were found to have a positive effect on the perceived aesthetics of urban squares, enhancing city image, duration of visit and the willingness to revisit (Raškovíc and Decker, 2015); and lines or clusters of trees provided aesthetic enhancements to streets, civic spaces and parks (Coles et al., 2013).

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Relating to the category 'location and proximity to people' it was found that urban trees must be visible and in close proximity for the service of aesthetic enhancement to be provided, as evidenced by the effect of green views on property prices (Jim and Chen, 2006). Finally, Davies et al. (2017) identified literature under 'land use and ownership' which showed that a view of a (publicly inaccessible) greenspace can be as effective for mental well-being as having access (Grahn and Stigsdotter, 2003).

The next section (Governance) includes a sub-section that specifically addresses the governance of urban trees.

4.6 GOVERNANCE

The future National Forest for Wales, if seeking to actively involve communities, needs to be built on an understanding of woodland governance and how communities are already involved in such processes. This section investigates these issues, providing evidence from Wales wherever available.

4.6.1 What do we mean by involvement in governance?

Governance is a set of relationships and processes which determine how power and responsibility are exercised, who is involved in decision making and when social capital is mobilised (Leys and Vanclay, 2011). Governance of woodland and forestry resources, projects and initiatives involving the public and communities also relates to gaining and sharing authority and community capture of the benefits (Teitelbaum, 2014). For some, governance is also reflected in the concept of "empowerment" (Stanzel et al., 2020). There is some debate about how positive a development is the opening up of the governance of woods and forests to the public and communities. Some research suggests that it may not be democratic (Baynes et al., 2015), because greenspace is often "*embroiled in the 'micro-politics' of community action*", and can be "*captured*" by the agendas of better resourced community members, with the semi-privatisation of public space being an extreme result where interaction is with market driven owners (Dinnie et al., 2013; Perkins, 2010). Other evidence suggests that opening up governance may be more democratic and the "*best efforts are a combination of effective decision-making, including adequate representation, and sustained efforts in public participation*" which encourage not only the formation of social capital, but also improve social inclusion (Teitelbaum, 2014).

4.6.2 How are the public and communities involved in woodland/forest governance?

A number of studies have shown the development of different kinds of woodland and forest governance arrangements involving the public and communities, with variations in outcome attributable to institutional arrangements, collective values, and social practice (; Lawrence and Ambrose-Oji, 2013; Lawrence and Ambrose-Oji, 2014; Ambrose-Oji et al., 2015); the degree of decision-making power afforded actors (Tidey and Pollard, 2010); or the form and function of engagement with public agencies (Swade et al., 2013).

4.6.3 Evidence from Wales

Kitchen (2013), looking at the situation in the South Wales Valleys, presents an analysis that suggests, up until 2012/13, a re-organisation and changes in the structure of Forestry Commission Wales (FCW) now Natural Resources Wales (NRW), particularly at District level, had reduced contact with local communities, and reduced or removed their connection with the agency.

Subsequent attempts by FCW to work towards social and community inclusion in governance had reached a kind of "peak consultation" exemplified by the Valleys Woodland for Valley's People project, which he suggests had done little to negotiate the tension between the competing use of forests as production and consumption (i.e. recreation and amenity) spaces. All of this had left communities frustrated with a feeling they "*were unable to provide meaningful inputs into what they require from their local environment,*" despite the procedural intentions to increase their influence (Kitchen, 2013: 1980). A later assessment of the impacts of the Woodlands and You (WaY) scheme also highlighted difficulties in involving communities in the use, management and governance of the Welsh Government Woodland Estate (Gronow et al., 2015). The WaY scheme was linked to the strategic policy objective of ensuring "*More communities involved (sic) in the decision making and*

management of woodlands so that woodlands deliver greater benefits at a community level."
(Gronow et al., 2015 quoting WG, 2009: 10).

Indicators used in the evaluation included metrics tracking public and community involvement
in planning, volunteering and membership of community woodland groups. The authors note
a significant issue with the data available to assess the success of the WaY scheme, since
NRW did not routinely collect monitoring evidence. They conclude that there was low rate of
uptake and few reportable impacts, either in terms of governance or the flow of any other
benefits such as social capital or wellbeing impacts.

Looking at the potential for communities to take on governance responsibilities of an NGOs
woodland sites in Wales, Over et al. (2015) conducted a survey of communities and
individual across Wales to canvass opinion on the potential for community governance and
management of Woodland Trust woodland sites.

There was no evidence of any significant appetite to do so, with respondents discussing a
number of barriers including the location of many sites being too far to travel to, the
complicated legal position and daunting task of agreeing governance arrangements, group
and individual capacity to take on governance and management. Similar factors were
reported as barriers to effective governance amongst community groups at a workshop in
England, with the additional issues of woodland owners not always being fully supportive of
what groups are trying to achieve, and the public having a negative perception of woodland
management which mitigates against actions on sites (Ambrose-Oji, 2013).

During 2014, Llais Y Goedwig organised 15 regional events across Wales with a mixed
constituency of participants including members of the public, community groups, NGOs and
others involved in the woodland sector (Wilmot et al., 2015). The purpose was to take stock
of what was happening with community woodlands in each region and look to a future vision
for community-based governance.

Discussions in the workshops showed that for the most part, the involvement of the public
and communities in woodland governance was steady "*jogging along*" but in many areas it
was described as static, without any expected growth. Barriers to increasing the community
involvement pointed to funding and capacity being a key concern. There was an aspiration
to set up more community woodlands and expand governance onto sites owned by other
parties, but the sustainability of governance arrangements and current projects was a critical
issue across all five regions.

4.6.4   Evidence from elsewhere

Ambrose- Oji (2020) reviewed existing and innovative and emerging forms of governance to
describe different combinations of partnership, co-working, consultation, stakeholder
constellations and tenure types as shown in table 4.8 below. This table illustrates how
members of the public and community groups are able to take part in, and influence, the
governance of community owned woodland, sites owned by NGO's and charities, and sites
owned by government and public agencies. The engagement in governance may be through
formal consultation processes and inputs into design plans or may be more active and
involve practice-based decision making and action.

Table 4.8. Forest governance arrangements in Britain: community and citizen involvement (Ambrose-Oij 2020: 245-6)

Practice type	Actor constellation and locus of power over woodland resources		
	Community-based organisations facilitate and lead	Third sector organisations (e.g. NGOs, charities, and civil society organisations), facilitate and/or lead	Government and public agencies facilitate and/or lead
Environmental volunteering	Citizens take part in regular work parties or *ad hoc* actions with, and for, community woodland groups that hold ownership or tenure of woodlands e.g. *Gorham and Admiral Community Woods, Bicknor, England*	Citizens take part in regular work parties or *ad hoc* actions with/on behalf of organisations with ownership or tenure of woodlands such as the Woodland Trust, or the National Trust. This may be organised through a third party institution such as, e.g. *The Conservation Volunteers*. Can also include, e.g. *citizen science initiatives such as National Bluebell Survey for Woodland Trust.*	Citizens take part in regular work parties or *ad hoc* actions with/on behalf of state forestry services or other government public agencies, e.g. *i-Tree or Observatree citizen scientist volunteers* for the Forestry Commission in London, or **volunteering on the public forest estate in Wales or Scotland**
Management of woodlands	A defined, constituted or legally incorporated community woodland group run by local people, with ownership or formal tenurial rights, managing one or more specific woodland sites according to their own objectives e.g. **Blean Bran Community Woodland Group**, in south Wales or Gordon Community Woodland, Gordon, Scottish Borders, Scotland	Formal or informal arrangement to undertake management on woodland in tenure of civil society organisation e.g. **Arkaig Community Forest** and the *Woodland Trust co-governance of forest land Lochaber, Scotland*	Formal or informal arrangement to undertake management on woodland in public ownership to maintain ecological and social benefits e.g. *Ashford Community Woodland, for Ashford Council* in England, or **Friends of Tower Hamlets Cemetery Park**, for *Tower Hamlets Council in London*, or on state forest land, e.g. *Friends of Newton Hill Woodland in Scotland*
Woodland-based social enterprise	Enterprise-oriented endeavour, may be a community woodland group or another formally constituted or legally incorporated group using and/or managing woodland with ownership or formal tenurial rights to generate social and environmental benefits e.g.**ARC CIC at Foundry Wood** *Leamington Spa, England providing an innovative service offer to the local community*	Enterprise-oriented endeavour undertaken on woodland in civil society organisation ownership, to produce social and environmental benefits, e.g. **Wood Matters on National Trust land**, *Cumbria, England engaging the community in an income generating woodshare scheme*	Enterprise-oriented endeavour undertaken on woodland in public ownership, to produce social and environmental benefits, e.g. *Neroche Woodlanders, near Taunton, England*
Public engagement	Community woodland groups consult the wider local community about forest management, may be as part of asset transfer processes or as more general attempt to involve community in governance, e.g. *Hill Holt Wood, England*	Active citizenship though involvement in third sector organisation campaigning and protest which may be traditional, or using social media platforms, e.g. the Woodland Trust's *Enough is Enough* campaign, or *38 Degrees fight against sell-off of public forest estate in England*	Citizen and community group involvement in formal public consultation processes, e.g. *Harnessing the Energy of the Community, Thetford Forest, England or Central Scotland Forest Design Planning processes on public forest estate woodlands*

Practice type	Actor constellation and locus of power over woodland resources		
	Community-based organisations facilitate and lead	Third sector organisations (e.g. NGOs, charities, and civil society organisations), facilitate and/or lead	Government and public agencies facilitate and/or lead
Hybridised practice through partnerships and collaborative working	Formal and informal associations of community woodland groups, working in partnership with each other or with other private and public agencies to deliver benefits for community woodlands e.g. *Llais Y Goedwig, community woodland association in Wales delivering Government policy priority actions through formal partnership*	Community forestry groups or active citizens involved in the governance of woodland with, through or for third sector organisations, often involving other stakeholders, e.g. *Mersey Forest and other Community Forests in England working with citizen groups and other third sector organisations and public agencies to deliver new Northern Forest* bringing private and public sector funding together to achieve Government policy ambitions for regional tree cover	Formal partnership or other arrangements for citizen groups or community woodland groups to support publically owned and managed sites with public agencies and others, e.g. *Friends of Westonbirt, running Westonbirt National Arboretum with the Forestry Commission near Tetbury, England*

Looking at involvement in the governance of public forests, there are numerous examples of partnership between government and communities, which also show increased influence in governance follows through to a supply of different public and private goods (Pinkerton et al., 2008). Evidence also suggests resistance amongst central governments to relinquish authority to communities, especially for those activities with revenue-generating potential or strategic importance. (Teitelbaum, 2014; Egunyu and Reed, 2015; Davis et al., 2020)

In their review of the evidence for the UK (Holstead et al., 2018) see that where community involvement in governance is seen as "*an alternative to the state, rather than a supplement to state action, community involvement to reach environmental outcomes has potentially regressive tendencies*" because it can "*imply action coming from only those with sufficient capacity and resources, potentially excluding less well-resourced actors*"

Many local authorities are looking to include people in governance, and it forms an important part of their decision making (Neugarten et al., 2012; Ordóñez et al., 2020a; Ordóñez et al., 2020b). This popular move to "localism" and innovation in maintaining assets of community and public importance has also seen local authorities take an interest in including the public and communities in the governance of woodlands and other spaces with a tree component such as urban parks. Swade et al. (2013b) undertook a review of LAs and community involvement in governance in England, and a similar study was conducted in Wales (Gronow et al., 2014), with van der Jagt and Lawrence (2019) and Lawrence et al. (2014b) examining the situation for local authorities in Scotland.

All three studies showed that whilst there was a willingness for local authorities to engage with the public and communities and include them in governance, limited knowledge of the extent of their woodland resource, limited staffing and funding, and limited range of formal mechanisms and processes for engaging with the public and communities were hindering ambitions. Jones (2002), looking at the relationship between 'Friends of' groups and local authorities in England, emphasised this process and resourcing element and the two-way commitment to innovative governance arrangements which places stress on both parties.

A "Health Check" assessing the governance relationships between the public, communities and authorities in charge of the public forest estate in Scotland, collected evidence around specific dimensions of governance including transparency, accountability, representation, and empowerment (Lawrence et al., 2014a). This recorded a host of successes in

partnership and co-management approaches, but also detailed challenges and barriers. The range of experiences articulated showed how shared governance relied on clearly defined and manageable process, and strong and open communication. Key barriers to effective governance existed around: public agencies and communities not really understanding the working culture, limitations and capacity of either side; uncertainty and misunderstanding of the rules and regulations which applied to the public forest estate, including lack of community understanding of how to navigate this complexity; procurement rules and procedures working against community focused enterprises and interest;, and time and lack of consistency to build co-governance and co-management across forestry areas.

There is a substantial body of evidence about communities and the governance of the urban forest. For example, Butt et al. (2021: 127053) review a number of research papers to assert that "*When urban forests and individual trees are valued at the neighbourhood level, it often leads to communities working together for their protection. In so doing, individuals or communities become more directly involved in planting activities on public and private land, as well as involved in more sophisticated planning and policy issues*." However, they also show that public and community involvement in urban forest governance is not homogenous but varies by the mechanisms provided by municipalities, awareness and knowledge individuals have of processes etc., and the opportunities they spot to influence decision making and management (Butt et al., 2021).

Uneven public participation across different neighbourhoods can lead to imbalance in the planning and decision-making for greenspaces that impact not only climate change adaptation measures and environmental protection, but also community improvement, concern for social conditions, empowerment in decision-making processes, and lack of confidence in elected officials' platforms (Balram and Dragićević, 2005; Heynen et al., 2006; Heynen, 2003; Lefland et al., 2018; Nelson and Pettit, 2004; Vogler, 2003). For example, Conway et al. (2011) found that resident associations may be supporting the uneven distribution of the urban forest.

5 SOCIO-CULTURAL LINKS TO WOODLANDS

This section sets out socio-cultural links to woodlands and looks at how people can be connected to their woodlands by incorporating woodland planting with cultural features, how the Welsh language features in woodland projects and programmes, and the role of green infrastructure more broadly.

The Welsh Government recognised that new woodland creation and the planting of individual trees or groups of trees must be appropriate to the landscape, heritage and cultural values of the specific location. As they stated:

'Wales has a wealth of important individual trees with historic, cultural and environmental interest across rural, peri-urban and urban locations and a variety of settings from fields, parks, gardens, streets and within woodlands. The importance of ancient woodlands and veteran trees as a cultural heritage resource through linking people to a place, environment with culture and the present with the past should not be under-estimated' (Welsh Assembly Government, 2010a, p15).

This section therefore seeks to identify evidence from Wales and elsewhere of examples of initiatives that have sought to combine cultural features and woodland. It also explores the connection between language and woodland.

5.1 CONNECTING PEOPLE TO THEIR WOODLAND BY INCORPORATING WOODLAND PLANTING WITH CULTURAL FEATURES

5.1.1 The connection between cultural features and woodland

Edwards (2006) identified three different definitions of cultural and heritage sites and features in forests:

- Cultural heritage sites and features located in the forest, but for which the forest is not a direct part of their cultural value, e.g. Scheduled Ancient Monuments.

- Cultural heritage sites and features such as ancient trees, forests, stands or landscapes, which have cultural interest because they have been, or continue to be, managed in traditional ways.

- Modern man-made cultural sites and features such as sculptures or nature observation hides, which have cultural interest, value and attraction to the public beyond their purely practical function, and which somehow interpret or interact with their forest setting.

Forest Research[8] recognise the value of the cultural heritage of woodlands in connecting people and places. This cultural heritage includes individual features such as standing stones, military or industrial sites, and large-scale urban or rural historical landscapes. Ancient trees, hedgerows and geological features in a woodland may also have an influence

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[8] https://www.forestresearch.gov.uk/tools-and-resources/fthr/urban-regeneration-and-greenspace-partnership/greenspace-in-practice/benefits-of-greenspace/culture-and-heritage/

on the character of the surrounding landscape and past human activity. These features can be used in a woodland planting project to provide a focal point, which can also provide educational benefits. The cultural value of a scheme can be enhanced by using archaeological interest as a guide to conserving and interpreting heritage features in the woodland.

Tabbush (2010) notes that cultural histories, stories and meanings make the forest interesting and attractive to visitors, and states that managers can enhance these meanings and create new meanings in a way that increases the value of the forest (e.g. by holding cultural events or installing artworks). Parviainen (2006, p67) also states that "*recognising the cultural and spiritual values shows that forest management is not only production or protection but also maintaining the relationship between people and fores*t".

5.1.2   Examples from Wales

Locally distinctive woodland is important in the concept of "placemaking" which is central in planning policy in Wales (see, for example, Welsh Government, 2021, p12). An example from Wales of a community woodland project that embeds a cultural symbol is the Spirit of Llynfi Woodland, located in the Upper Llynfi Valley, near Bridgend. This community woodland was designed and developed with the community on the former Coegnant Colliery and Maesteg Washery. Standing in the middle of the new woodland is "The Keeper of the Colliery", a Welsh oak sculpture of a miner which celebrates the lives of the hundreds of miners who once worked in the valley. "The Keeper" was the idea of the local school children who wanted something on the site to remind people of its industrial heritage[9]. A Keeper of the Colliery poem was also written by local historian and former colliery worker, Roy Meredith[10]

In the course of gathering materials for this review the project team were sent an extract from an unpublished narrative that had been prepared for a Woodland Charter in 2015 on the history and cultural importance of woodland in Wales (pers comm). It quotes extensively from "Welsh Woods and Forests: A History" (Linnard, 2000) which is now out of print. Parts of this narrative are included here but cannot be verified:

> "*Wales has a rich tradition of oral stories, and those include some graphic descriptions of forests. The ancient Owl of Cwm Cawlwyd is a magical bird consulted by Culhwch, in the story 'Culhwch and Owen', part of the oldest collection of Arthurian stories in Welsh, known as the Mabinogion . Linnard calls the Owl's account a 'vivid description' of the ebb and flow of forest clearance and woodland regrowth which pollen records and other archaeological evidence show had been going on in Wales, especially in the uplands, for thousands of years*".

Welsh Assembly Government (2010a) notes that ancient Semi-Natural Woodland is recognised as a key woodland type for landscape and cultural heritage. Plantlife (2012) state that of all woodlands in Wales, about 20% occur on the site of ancient or long-established woodlands (Woodland Trust, 2021). Restoring these woodlands, which are richly represented in Welsh mythology and culture (Henwood and Pidgeon, 2001), is viewed as a

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[9] https://naturalresources.wales/days-out/places-to-visit/south-east-wales/spirit-of-llynfi-woodland-near-bridgend/
[10] https://www.youtube.com/watch?v=Uw_mnigj0UM

priority (Plantlife, 2012; Woodland Trust, 2021). The ancient Semi-Natural Woodlands of Wales include the Celtic Rainforest which is nationally and internationally important as a rich and rare home to wildlife (Woodland Trust, 2021). The Celtic Rainforests Wales project is being delivered in four areas in West Wales (including Snowdonia, Cwm Einion, Cwm Doethie-Mynydd Mallaen and the Elan Valley) and aims to secure the long-term future of these oak forests for future generations to enjoy[11]. Free educational visits and resources, as well as volunteering opportunities are encouraging people to engage and connect with the project, helping the project to meets its aim of conserving and enhancing the natural beauty, wildlife and cultural heritage of the Celtic Rainforests.

The National Forest for Wales archive, part of The People's Collection Wales[12] is in its early stages, but its main role is to provide support with developing an archive of material relating to woodland heritage in Wales (pers comms, People's Collection Wales). The hope is that the National Forest will celebrate Wales' woodland heritage by collating community-generated content on the platform and establishing a discoverable, usable archive for others to enjoy (pers comms, People's Collection Wales).

Tabbush (2010) highlights the importance of developing artworks with the community which has local meaning, but which would also enhance the cultural value of a location in a way that would attract locals and tourists alike. This is particularly important when involving mining communities in new woodland planting projects, which may incorporate mining heritage features in the planting scheme. In a review of the economic and political context of coal mining in South Wales, Merrill and Kitson (2017) stated that inhabitants of the Valleys possessed and continue to possess distinct characteristics that they regard as their collective identity.

"This identity reflects the depth and resilience of community networks and can be engaged to great effect in support of economic and social transformation. History and heritage, culture and the arts, are all invaluable components of mining communities and worthy of support in order to maintain social cohesion, increase participation and engender enthusiasm and support for renewal" (Merrill and Kitson, 2017, p24).

The concept of "time-depth" with respect to Welsh landscapes and the importance of continuity is noted in the ERAMMP National Forest Evidence Review: "Ancient woodland and trees contribute positively to what is considered beautiful and this is reflected in the Welsh Register of Historic Landscapes."[13]

Merrill and Kitson (2017) note that in South Wales it is well understood at all levels that coherent strategies have proved difficult to orchestrate and deliver. As mining communities have their own distinct cultural identity this needs to be incorporated when considering the inclusion of mining heritage/culture in tree planting schemes, especially if engagement and involvement by the community is desired.

5.1.3   An example from England

The Welsh Assembly Government (2010b) report states that new woodland can often provide an integrated solutions to landscape 'problems' such as brownfield restoration and development or the reclamation of industrial sites. The regeneration of the coal mining area of the English East Midlands, by planting thirty million trees to create the National Forest, is

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[11] https://www.snowdonia.gov.wales/looking-after/life-celtic-rainforests-project
[12] https://gov.wales/national-forest-wales
[13] ERAMMP National Forest Evidence Review. Annex 5 Ecosystem Services. P 32

an example of sustainable development, bringing together economic growth (timber production, tourism and 'green' business) and environmental enhancement (Cloke, et al., 1996). The important point about the National Forest in England is that the development of the forest has actively focused on building on and incorporating the cultural heritage of the mining industry across that area.

5.2 WOODLANDS AND THE WELSH LANGUAGE

As described above woodlands have an important place in Welsh culture and are also represented in the Welsh language, as demonstrated by the following quote:

> "Immediately this Welsh phrase springs to mind, which has previously inspired me: 'Dod yn ol at fy nghoed' – which literally means 'to return to my trees', but is better translated as 'to return to myself / my right mind'. It's a beautiful reflection on how trees can help our wellbeing, I feel, and one that is not easily re-created in the English language. It's an old saying –which has recently become popular, (for example in this painting by Aberystwyth artist Lizzie Spikes of Driftwood Designs Lizzie Spikes- Driftwood Designs - Dod yn ol at fy nghoed)...A Welsh saying that means to find peace and equilibrium and literally translates as 'coming back to my trees'." (pers comms, Coed Lleol)

Woodland names are an important connection to Welsh language, culture and history. Anthony Lias, (1991; cited by Gwynn, 2016) states that place names themselves are peoples' history. The names of many Welsh organisations focusing on woodland, show that Welsh language and woodlands have important links, e.g. Coed Lleol, Llais y Goedwig, Coed Cymru, Coed Cadw, and Tir Coed. There are also many local woodland groups with Welsh names, some of whom are Welsh speaking groups, while others use a Welsh name due to the cultural significance or the name of the woodland they are based in, e.g. Coed y Bont, Coed y Bobl, Coed Llwynnon[14] (pers comms, Coed Lleol).

There are also several partnership projects which have a Welsh language identity and are trying to draw on Welsh culture and heritage, e.g. the Celtic Rainforests Project (with involvement of the Snowdonia National Park, RSPB, Woodland Trust)[15] (referred to above).

When considering names for woodland projects and programmes there are various layers of Welsh culture and history to consider. Gwynn (2016, p1) notes that Wales has several layers of historical linguistic contact, as explained in the Dictionary of Place Names of Wales (2008). There have been successive and overlapping periods in Welsh history (Celtic and Brittonic, the Roman occupation, Anglo-Saxon settlement, Scandinavian invasions, Anglo-Norman conquests and English immigration) which have all left their toponymic footprints. Gwynn (2016) advises bearing these influences in mind when attempting to interpret place names in the landscape.

> "The language of our landscape illustrates both continuity and change in our history and culture. Names can be read in different ways; at their simplest they provide a descriptive, and often poetic portrait of the country. But those words, printed on maps and etched into memories, have shadows behind them – of past lives and livelihoods, of changing settlement patterns and shifting cultures, of

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[14] https://llaisygoedwig.org.uk/
[15] https://celticrainforests.wales/

socio-political struggles, and of economic fortunes and failures. They also hint at the rich tapestry of habitats that has frayed and unravelled across our landscapes; leaving only bare threads hooked tentatively onto a 21st Century canvas by evocative combinations of vowels and consonants" (Gwynn, 2016, p1).

Gwynn, (2016) notes the importance of language heritage as a distinctive, valued element of landscapes in Wales and using the Welsh language is a way of interpreting the woodland/ forest landscape. Gwynn (2016) recognises the importance of understanding how the language of the physical landscapes can inform sense of history and cultural identity. Individual practical projects that bring these intangible elements of the Welsh landscape to life have a significant role in management approaches, by offering more diverse ways in which people can become involved with the natural environment and landscapes (Gwynn, 2016), including wooded landscapes.

There are concerns about the Anglicisation of Welsh place names, beyond those relating specifically to woodlands[16], a process that is not new. For example, prior to the industrial revolution, the town and community of Mountain Ash in the South Wales Valleys was known as 'Aberpennarth.' However, the English name 'Mountain Ash' has long been in common usage even among Welsh speakers in the area, named after the Mountain Ash Inn that opened near the developing village in the early nineteenth century. In June 2020 15,000 people signed a petition to go before the Welsh Senedd expressing concern about the loss of Welsh heritage through the changing of place and property names[17]. This is significant for woodlands and trees as many Welsh place names include tree-related terms and names, such as, derw or deri (both oak), helyg (willow), celyn (holly), and gelli (grove) (*pers comms*).

Although from outside of Wales a strong example of a woodland planting project making use of language is Borgie Wood in Highland Scotland, which was established under the Millennium Forest for Scotland project. To help promote a community connection, Scottish Gaelic was used in the design and creation of the woodland, and a standing stone was erected at the entrance to the woodland, on which was engraved a spiral branch with leaves associated with the ancient Gaelic alphabet. Below this the letters of the alphabet were engraved, together with the names of the trees in Old Gaelic and their English translation. Pieces of Caithness flagstone were also laid along the path which were sandblasted with designs of the leaves of the trees and Gaelic proverbs, together with their translation into English.

5.3 GREEN INFRASTRUCTURE

5.3.1   What is green infrastructure?

In many contexts across Britain, it is now recognised that trees often form part of a wider network or patchwork of green infrastructure. In parallel, is a recognition of the importance of protecting and enhancing green infrastructure so as to maintain the benefits to be derived (see for example, Welsh Government, 2021, p131). Although there is no commonly accepted or authoritative definition in the UK, green infrastructure refers to the combined structure, position, connectivity and types of green spaces which together enable delivery of multiple benefits as goods and services (Forest Research, 2010; O'Brien et al., 2017). Green infrastructure can include wildlife areas and woodlands, road verges and rights of way, parks

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[16] https://www.walesonline.co.uk/news/wales-news/welsh-place-names-risk-being-21701048
[17] https://www.walesonline.co.uk/news/wales-news/welsh-place-names-english-row-18512035

and gardens, canals, rivers and wetlands, green-grey infrastructure such as green bridges and green walls or roofs, and natural flood management and sustainable drainage.

5.3.2   What is the role of connectivity in green infrastructure?

Forest Research (2010) stressed that, for an individual greenspace, its relative positioning within a built-up area and its connectivity with other areas are of paramount importance to ensure that the combined benefits of green infrastructure are maximised. "*With care given to planning, management and community involvement at the landscape, community and individual site levels, the benefits of green space can become additive and even synergistic, far outreaching the sum of benefits from each individual site*" (Forest Research, 2010, p31). When sites are connected their value intensifies giving further benefits such as sustainable transport opportunities through walking and cycling ways and promoting populations of fauna and flora to thrive. Such connectivity stretches beyond local authority and urban versus rural boundaries (Forest Research, 2010; Chatzimentor, Apostolopoulou, and Mazaris, 2020). O'Brien et al. (2017) state that recreational infrastructure consisting of a network of greenways, recreational roads, paths, tracks and trails is essential for enabling accessibility in many countries.

Forest Research[18] have described a recent drive towards improving the extent and linkage of greenspace within the urban environment, and an aspiration to adopt green networks as a planning strategy, for example the Glasgow Clyde Valley Green Network Partnership[19]. The adoption of a green networks approach to spatially target the provision of greenspace and increase connectivity can offer a more effective strategy over simply increasing the amount of greenspace.

5.3.3   What benefits may arise from green infrastructure?

Green infrastructure is considered to be a vital element of healthy places (Lovell et al., 2020). The evidence from a review of literature by Lovell et al. (2020) suggests that people who live in neighbourhoods with greater amounts of green infrastructure tend to be happier, healthier and live longer lives than those who live in less green places. It is likely that everybody benefits from green infrastructure. Lovell et al. (2020) state that although limited, studies have shown that green infrastructure supports health and wellbeing through promoting positive mental health, providing a context and motivation for physical activity and recreation, and allowing people to experience nature. Trees and woodlands are often a key component of green infrastructure, particularly in urban areas.

A study by Ray and Moseley (2007) focusing on the region of Edinburgh and the Lothians[20] also recognised that as well as providing habitat for biodiversity, woodland (or habitat) networks can also provide valuable recreational opportunities for communities. In one of the few Welsh examples found for this review, a strategy for Swansea Central Area (Natural Resources Wales, 2021) outlines how green infrastructure can restore nature and contribute to improving the economy, culture and health and wellbeing. It describes existing green infrastructure assets and sets out a vision for future provision of green infrastructure. Whilst the strategy is for the Swansea Central Area, it is hoped that it will eventually form part

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[18] https://www.forestresearch.gov.uk/tools-and-resources/fthr/urban-regeneration-and-greenspace-partnership/greenspace-in-practice/planning-integrated-landscapes/urban-green-networks-corridors-and-linkages/

[19] https://www.gcvgreennetwork.gov.uk/

[20] https://www.forestresearch.gov.uk/research/habitat-networks/forest-habitat-network-in-scotland/edinburgh-and-the-lothians-habitat-networks/

of a Green Infrastructure Strategy to be developed for the whole of the County of Swansea. Such a strategy provides an ideal vehicle for incorporating trees and tree planting into the development of connected green infrastructure.

CIEEM Wales Policy Group (2019, p2) recommends guidance on green infrastructure to include:

> "Greater emphasis on the multi-functional benefits that can be delivered through green infrastructure within a development, including the positive impacts on health and well-being of a community. This may include reference to specific features and habitats not typically considered within a masterplan design. For example, allotments and orchards provide benefits for the health and well-being of a community, whilst also providing a positive contribution to biodiversity".

Ray and Moseley (2007) emphasise a growing recognition of the benefits of woodland in the urban environment and the need to improve and expand urban woodland close to communities. This would require management of existing woodland as well as the planting of new areas. Despite this, Lovell et al. (2020) state that there is limited evidence for clarifying how the provision of new green infrastructure, or the modification and adaptation of, or changes to the management or promotion of existing green infrastructure, could be used to improve health and wellbeing. What the evidence does indicate is what is most likely to be beneficial in new developments is mixed green infrastructure provision, e.g. a mix of different sizes and types of publicly accessible greenspaces, domestic and shared gardens, green routes, street trees and so on, with appropriate connectivity between them (Lovell et al., 2020).

Pauleit et al. (2019, p2) emphasise the crucial role of urban green infrastructure for urban liveability, sustainability and resilience, and state that further development of urban green infrastructure is vital in addressing the huge challenges of global urbanisation - close to seven billion people are expected to live in urban areas by 2050 (United Nations, 2018).

Davies et al. (2017) set out the relationship between urban forest components and the services and disservices they deliver. Their framework drew on cultural ecosystem services based on categories of benefit identified by O'Brien and Morris (2013) they specifically focused on the urban forest components that are most likely to deliver such benefits (Table 5.1). Each of the urban forest components may be considered aspects of green infrastructure.

Table 5.1: Relationship between cultural ecosystem services and urban forest components.

Cultural Ecosystem Services	Urban forest components			
	Single tree	Line of trees	Tree cluster	Woodland
Health				
Nature and landscape connections				
Social development and connections				
Education and learning				
Economy				
Cultural significance				

█ Commonly delivered   █ Sometimes delivered   ☐ Rarely delivered

Source: Davies et al. (2017) Delivery of ecosystem services by urban forests. Forest Research.

A collaborative approach to the development of green infrastructure

A collaborative approach to the development of green infrastructure is needed to bring about the potential benefits, involving local government, scientific experts, NGOs, planners and site managers, as well as the local community. Benefits are likely to be maximised with community involvement as sites are more likely to be respected and communities will develop a sense of ownership. This should mean that vandalism and crime are reduced, and management costs are also lower. Without community support and 'buy-in' the risk of failure increases and the beneficial value is moderated (Forest Research, 2010).

6 COVID-19 IMPACTS ON PEOPLE, WOODLANDS AND WIDER NATURE

This section sets out the impacts of COVID-19 on people, woodlands and wider nature. Rotherham (2020) notes that one major observation to emerge from Covid-19 and global lockdown has been the significance of green spaces and especially trees and woods, in promoting and enhancing human health and wellbeing. This has been particularly important in poorer areas (in terms of socio-economic deprivation and low environmental quality) where trees and woods bring huge health and wellbeing benefits to local people (Rotherham 2020).

> *"During Covid-19 lockdown communities have re-discovered the joys and benefits brought to them by trees and woods on the doorstep" (Rotherham 2020, p187).*

Much of the evidence in this section discusses contact with nature and greenspace, broadly, and therefore does not always emphasise the importance of trees, woods and forests in particular. Also, much of the evidence is from outside of Wales.

6.1 PUBLIC USE AND APPRECIATION FOR WOODLANDS AND NATURE FOLLOWING COVID-19

6.1.1 Visits

Surveys across Britain investigating visits to nature during the Covid 19 restrictions found a polarised picture, with some people visiting nature more in 2020 and others visiting less (Armstrong et al. 2021). The work highlighted that age, status of health, ethnicity and socio-economic status had an influence on people's ability to access nature, with fewer people from deprived areas in England visiting compared with those in the least deprived areas. In Scotland those in the most deprived areas and those with an illness or disability being more likely to say that they had greenspaces within easy walking of their homes and of a good enough standard for them to want to spend time in them. In Wales, there was a considerable decrease in visits to the majority of Natural Resources Wales' recreation sites during the first lockdown. However, when restrictions eased there was a significant increase at many sites, although not all. Some sites continued to get fewer visits due to issues related to car parking, site restrictions, and tree felling.

6.1.2 Health and Well-being

Health and wellbeing were the focus of many studies that looked at greenspace engagement during lockdown and restrictions. Poortinga et al. (2021) state that the Covid-19 pandemic was a stressful and traumatic period for many, which also limited social interactions and travel as a result of severe restrictions, e.g. in Wales gatherings of more than two people were banned and residents had to stay within five miles of their home during the first lock-down in March 2020. Their study used data from Health Wise Wales, an existing national longitudinal study funded by the Welsh Government (Hurt et al. 2019) to explore the role of both public and private green space in subjective health and wellbeing during and after the first peak of the Covid-19 outbreak that took place in the UK in the first half of 2020. Analysis showed that both perceived access to public green space (e.g. a park or woodland) and reported access to a private garden were independently associated with better subjective wellbeing and self-rated health in both periods. Pouso et al., (2020) used an online survey, from nine countries (including the UK) under different lockdown scenarios, to investigate the links between nature exposure and mental health during the Covid-19 pandemic.

The study found that lockdown severity significantly affected mental health, while contact with nature helped people to cope with these impacts, especially for those under strict lockdown. More specifically, contact with nature during the Covid-19 lockdown was found to reduce the likelihood of reporting symptoms of depression and anxiety. These results were reiterated by Robinson et al. (2021) who also reported greater land-cover greenness within a 250 m radius around a respondent's postcode was important in predicting higher levels of mental wellbeing and noted significantly more food-growing allotments within 100 and 250 m of respondents with high mental wellbeing scores.

The studies contribute to existing literature which recognises the importance of having adequate good quality green spaces and nature nearby for maintaining physical and mental health. Urban parks and woodlands, in particular, were recognised for being one of the few public spaces that allowed for socially distanced recreation and physical activity during the Covid-19 restrictions (Poortinga et al., 2021). Poortinga et al. (2021) conclude that their results support other studies showing that green space can act as a buffer between negative life circumstances and health and suggest that the natural environment may be just as important as the social environment for community resilience and health. This is reiterated by Geary et al. (2021) who state that urban greenspaces should be considered a public health and social investment and a chance to rebalance our relationship with nature to protect against future pandemics.

6.1.3   Connection to Nature

Studies in England and Scotland focused on connection to nature during the Coronavirus crisis (McGlothen-Bell et al., 2021; NatureScot, 2020). In England, McGlothen-Bell et al. (2021) conducted a survey which sought the views of adults in England on the role of nature in communities during the Coronavirus crisis and its potential to help in recovery. The results showed that regardless of age, social class or income, adults supported protecting and investing in nature as part of the recovery, saw nature as important for health and wellbeing, and access to nature close to home as beneficial during the crisis. In Scotland, NatureScot (2020) provided an understanding of outdoor visits and engagement with nature during the time of the 'stay at home' message (March to May 2020).

Reported benefits gained from outdoor visits and engagement with nature included mental health benefits, feeling closer to nature and improvement in physical health. Many people had also noticed positive changes in their local area during the lockdown period, such as reduced noise levels, a reduction in pollution and more wildlife and nature than normal. Around half of the population in Scotland expected that the amount of time they spend visiting the outdoors would be greater after lockdown than it was before. Around 3 in 5 wanted to encourage their children to spend more time outdoors, while similar proportions wanted to continue to travel less for non-essential journeys and make more use of local greenspaces.

6.1.4   Forests

Studies in England, Germany and Vermont USA using surveys and interviews found general increases in visits to forests during Covid-19 (O'Brien and Forster, 2020; Derks, Giessen, and Winkel, 2020; Grima et al., 2020). The research in Germany and Vermont (Derks, Giessen, and Winkel, 2020; Grima et al., 2020) also found increases in first time visitors due to people having more time, flexibility and fewer alternative pastimes during the restrictions. In Germany there were also changes to the times of day that people were visiting with a more even distribution of visits throughout the day. Many new and existing visitors in England (O'Brien and Forster, 2020) and Vermont (Grima et al., 2020) want to sustain their increase in visits. In Vermont people were undertaking a range of activities from exercise to birding. The studies found a number of self-reported benefits in terms of wellbeing, all concluded by

suggesting that the importance of forests and nature for people during Covid-19 should be recognised and taken into account in future management and decision making.

A national survey of forests in Slovenia (Pichlerová et al., 2021) showed that forest accessibility was a paramount factor affecting the number of forest visits. When driving outside the local area was restricted during the Covid-19 lockdown, the highest number of forest visits increase was where people could walk a distance of less than 1-2 km to their nearest recreational forest. Pichlerová et al. (2021) emphasised the importance of managing existing and design new opportunities for nature and forest recreation, especially in areas where such opportunities have been missing to date.

 "Listening to forests" was a study by Qiu and Sha (2021) which compared the perceived restorative characteristics of natural soundscapes in Burleigh Heads National Park, Australia, before and after the Covid-19 pandemic. The study, based on the Attention Restoration Theory developed by (Kaplan 1995), highlighted the strong and significant effects of extent and fascination on compatibility for individuals during the Covid-19 pandemic. It revealed that, rather than focusing on the visual stimulus from a traditional perspective, the extensive and fascinating soundscapes in natural environments also underpin the process of mental restoration, which the researchers state was particularly important due to Covid-19. Qiu and Sha (2021) state that natural soundscapes have great potential to affect people's health and well-being and contribute to the experience of green space as a wellness product.

6.2 NEGATIVE IMPACTS OF COVID-19

6.2.1   Inequality of Access to Nature

An inequality of access to nature, particularly in urban areas, has been the main negative impact highlighted by Covid-19 (Armstrong et al. 2021; Shoari et al., 2020; Vivid Economics and Barton Willmore, 2020; Burnett et al., 2021; Spencer et al., 2020). Research findings highlighted sharp inequalities, with those classed as low socio-economic status being less likely to visit green and open space during national lockdown restrictions than those of high socio-economic status (Burnett et al., 2021; Spencer et al., 2020; The University of Glasgow Public Health Sciences Unit, 2020; McGlothen-Bell et al., 2021). Burnett et al. (2021) suggested that these inequalities may have been exacerbated, as females and older individuals were the groups most likely to have decreased visits following movement restrictions. Research cited by Shoari et al. (2020) showed that extended periods of confinement at home reduced physical activity, particularly among people with lower socio-economic status, and increased the risk of depression, anxiety, insomnia, and self-harm. Concerns were also raised that children and disadvantaged communities living in overcrowded homes and inner-city flats without access to outdoor space or private gardens would be disproportionately affected (Shoari et al., 2020).

Shoari et al. (2020) described the availability, accessibility and provision of publicly owned parks and gardens in urban areas in England and Wales (Cardiff, Swansea, and Newport). They recognised public parks and gardens as being the most visited form of green space among urban residents in the UK (Natural England 2019) and note their contribution to wellbeing by providing opportunities to experience nature, engage in physical activity, and feel a sense of social belonging and develop social interactions (Shoari et al. 2020). The crucial role of accessible green spaces was highlighted during the Covid-19 lockdown periods, but also highlighted were the limited resources available in cities which led to park closures, limited opening times and reduced services (such as park benches, children's play areas, and sports facilities) during the pandemic (Shoari et al., 2020). If parks and green spaces were constrained by design, and social distancing measures could not be

implemented, they had to be closed during the lockdowns (Community First Partnership, 2021).

These studies highlight the need to redress the underlying socio-economic inequality in access to, and use of, public and private open space, as well as the importance of green spaces remaining open in any future lockdowns and for governments to actively encourage use of these spaces to support mental and physical health.

6.2.2   Lack of care and anti-social behaviour

There is some case study evidence that with a rise in visitor numbers to recreational nature 'hot spots' there were some negative impacts in terms of overcrowding, littering and a degree of inconsiderate behaviours from some recreationists. At National Nature Reserves in England the increase in numbers led to high numbers of incidents being recorded including dogs off leads disturbing wildlife, fly tipping, wildfires and illegal parking (Armstrong et al. 2021).

6.2.3   Financial Impact

A set of case studies produced by Community First Partnership (2021), on behalf of The Local Government Association and the National Lottery Heritage Fund[21] demonstrated the negative financial impact Covid-19 had on council park services in Leeds, Nottingham, Plymouth, Rugby, Walsall and Watford. This financial impact included loss of income due to the closure of income generating facilities (e.g. car parks, sports facilities and visitor attractions) and the lost hours provided by volunteers who played a key role in the preservation of parks and green spaces (loss of in-kind volunteer contribution ranged from £12,000 to £1.56 million) (Community First Partnership, 2021).

6.2.4   Economic Value of Greenspace

A study by Day (2020) explored how the COVID-19 lockdown in England changed how people engaged with greenspace and impacted on the economic value they derived from those interactions. The findings showed that greenspace was seen as a significant source of welfare for people at a time when opportunities for alternative uses of leisure time were even more seriously limited. A key change identified by the study was that the lockdown rules forced people to get out of their cars and walk. Trips to greenspaces by car fell by 47% over the whole lockdown period with an associated rise of 34% in trips taken on foot.

This behaviour coupled with the increased engagement in outdoor recreation (particularly in the second period of lockdown) meant that the overall number of visits to the outdoors over the lockdown period changed little from those during normal conditions. Calculations suggested that despite the restrictions the economic value of greenspace to people in England fell by only £150 million over lockdown (or some 2.7% of that realised under normal conditions) (Day, 2020).

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[21] https://www.local.gov.uk/parks-fit-future

7 WOODLANDS' NEGATIVE IMPACTS ON SOCIETY

This section sets out some of the ways woodlands can have negative impacts on society, but also showcases how negative impacts can lead to positive action. Natural Resources Wales (2018) acknowledge that encouraging and promoting access to the Welsh Government Woodland Estate sometimes means having to manage conflicts and unwanted behaviour, and recognise illegal and antisocial activity associated with forests, woodlands and trees as a growing concern. The building and use of illegal mountain bike trails, illegal off-roading, wildfires started deliberately and incidences of fly-tipping are some of the issues which arise. Addressing these problems means working creatively and collaboratively, building on the existing partnerships with crime prevention officers and community groups, and also looking for new opportunities linked to Area Statements and local Well-Being Plans (Natural Resources Wales, 2018).

7.1 DISADVANTAGE OF WOODLANDS

The Public Opinion of Forestry Survey Wales, conducted in 2019, (Forest Research) included results about the disadvantages of woodland (Table 7.1). Findings showed that 47% of respondents believed that there was at least one woodland related issue that disadvantaged the local community. The most commonly identified disadvantages were that 'the woodlands near us are used for fly tipping' (26% of respondents in 2019) and 'woodlands near us provide a place for criminal activity' (15%). These were also the most commonly identified disadvantages in 2017.

Table 7.1: Disadvantages of woodlands for the local community

	Percent of respondents				
	2011	**2013**	**2015**	**2017**	**2019**
The woodlands near us are used for fly tipping	..	..	..	22	26
Woodlands near us provide a place for criminal activity	15	12	12	15	15
We can't control what happens in our local woodlands	11	8	12	9	10
Timber lorries make me feel unsafe walking/driving on the roads	7	3	8	7	6
Woodlands don't provide local jobs - contractors from elsewhere are used	9	7	6	6	6
Timber lorries/visitors to woodlands make the roads busy	7	3	7	7	5
It's really difficult to get firewood from our local woodlands	5	5	3	2	3
Woodland operations create carbon dioxide making climate change worse	1	1	2	2	2
Woodland operations and visitors create noise pollution	2	1	2	2	2
The woodlands near us can't be accessed	5	1	3	3	2
The woodlands near us aren't nice places to visit	4	2	2	2	2
The woodlands get in the way of development around the community	2	1	1	1	2
Managing woodlands pollutes the air/water/soil	1	1	2	1	1
The woodlands near us aren't good for wildlife	2	1	1	1	1
The woodlands make our landscape worse	1	0	1	1	1
Other	1	3	3	0	2
At least one reason	42	39	38	43	47

Source: Wales Public Opinion of Forestry Surveys.

Tree planting on brown field industrial sites is not always viewed as the best solution for recovery of these areas. Olds (2019) states that colliery spoil tips are undervalued and misunderstood and sees tree planting on colliery spoil as inappropriate and a threat to these valuable sites. Olds (2019, p1) notes that "*quietly these sites have become habitats rich in biodiversity with a characteristic flora and fauna that boasts many scarce and rare species. The powers of nature have transformed the colliery spoil sites of South Wales into visually spectacular wildlife havens*". Olds (2019) recognises these spoil sites are an integral component of the rich culture and industrial heritage of Wales, but states that they are most valuable when kept as open habitat. As such, he argues that tree planting should be avoided on these sites and management implemented to retain open conditions.

7.2 DISADVANTAGE OF STREET TREES

Also included in the Public Opinion of Forestry Survey, Wales 2019, were the disadvantages of street trees (Table 7.2). 65% of survey respondents selected at least one disadvantage of street trees from the response options provided, an increase from around 56% in previous surveys. As with previous years, the most commonly selected disadvantages in 2019 were 'falling leaves and branches make a mess and are a health and safety hazard' (35%) and 'street trees damage buildings and cause subsidence' (26%).

Table 7.2: Disadvantages of street trees for the local urban area

	Percent of respondents			
	2013	2015	2017	2019
Falling leaves and branches make a mess and are a health and safety hazard	27	34	33	35
Street trees damage buildings and cause subsidence	17	18	18	26
The trees are not properly looked after	..	11	15	15
Street trees reduce light to nearby houses and buildings	13	10	11	15
Trees hide views	10	12	9	14
We can't control what happens to the street trees	7	5	8	10
Carrying out work to the trees causes disruption and mess	6	6	7	9
Trees cause interference to TV reception and effectiveness of solar panels	7	6	5	9
The trees make the roads less safe	..	9	9	7
Trees harbour pests	4	5	3	5
Street trees in urban areas near us provide opportunities for criminal activity and vandalism	4	4	5	4
The trees get in the way of developments in or around the urban area	1	3	2	2
The trees in the urban areas near us aren't good for wildlife	1	2	2	1
The trees make the urban landscape worse	1	1	1	1
Other	2	1	0	2
At least one reason	56	58	56	65

Source: Wales Public Opinion of Forestry Surveys.

7.3 MANAGING CONFLICTING USES AND ANTI-SOCIAL BEHAVIOUR

In 2005 O'Brien and Tabbush reported on a seminar addressing crime and safety issues in forests, organised by Forest Research and supported by Lancashire Constabulary, CABE Space, and English Nature (now Natural England). A workshop at this seminar focused on access and exclusionary behaviour in the Welsh Valleys Forest. The Valleys Forest is the

largest urban forest in Europe with a resident population of nearly one million, and an increasing role to play in terms of provision of recreation, education and tourism. The forest faced many negative issues and challenges, and the workshop began with a brainstorming session to look at some of the main exclusionary behaviour activities that took place in many woodlands and natural spaces (Box 7.1).

Some of these activities were illegal while others were anti-social or conflictual in that they reduced or prevented other people enjoying woodlands and natural spaces. The workshop also identified a number of management tools available to deal with some of these activities or prevent them from occurring (Box 7.1). These included more 'on-the-ground' staff, awareness raising, and activities with schools.

Box 7.1*: Exclusionary behaviour activities and management tools to deal with these activities*

Exclusionary behaviour activities	Management tools
Anti-social behaviours • Arson/fires • Litter • Sexual activity/public decency issues • Fly-tipping – asbestos, gas canisters, tyres, fridges, industrial waste • Garden waste tipping • Air rifles/shooting/firearms/missiles • Alcohol use/abuse • Drugs/glue use/abuse • Vandalism – graffiti/infrastructure/environmental damage • Dog fouling/dangerous dogs • Car dumping/joyriding • Unlawful construction • Noise • Gangs Conflicting uses • BBQs • Off-roading (4 x 4 vehicles) • Cult behaviour – witchcraft • Raves	• Signage Byelaws: fires • Publicity campaigns • Awareness raising • Staff – physical presence • Enforcement • Education – schools/next generation • Diversionary activities/rewarding • Community involvement/ engagement/ empowerment • Partnerships: police/fire service • Site security/boundaries/car parks • Design, species selection, management

Source: O'Brien and Tabbush (2005).

Anti-social use of woodlands was also a theme of a study by O'Brien (2005) which involved in-depth discussion groups in England. Participants described how a local woodland had become a no-go area because groups of young people were setting fire to the trees, stealing cars, driving them into the woods and setting them alight. This behaviour was disliked by residents who wanted to use the woodlands without feeling threatened by others. Residents often associated anti-social behaviour with the lack of anything constructive for young people to do.

Bell et al. (2003) state that the ways in which children and teenagers make use of woodlands can be classed as either positive (use) or negative (abuse) by landowners, managers and by different groups of children and teenagers themselves. As part of a wider study examining local use and social inclusion in woodlands close to towns in central Scotland, Bell et al.

(2003) used qualitative research techniques to explore the contested views of freedom and control as expressed by site managers, adults, children and teenagers. The forest abuse described by managers included litter, fly tipping (people taking household or other waste and dumping it illegally in the woodland), vandalism, fires, car burning, poaching game, dog fights, damage to trees and motorcycles.

Problems were reported to be most prevalent near towns in more socially and economically deprived areas. Managers identified several categories of abusers, but one of the most significant were younger people, in their early- to late-teens, who, it was claimed, had little to do and abused woodlands for their own entertainment. Their abuse included joy-riding, lighting fires, drinking, drug abuse and sexual activity. It was noted that this might have the advantage of keeping the abuse out of the towns, where it may be more harmful. This supports the view by O'Brien (2005) who states that when people talk about woodlands it is almost never in isolation but as part of the wider environment and also as part of their wider everyday life. Bell et al. (2003) state that teenagers' needs, and the opportunities woodlands can provide for developing a sense of identity and testing of boundaries are poorly understood or tolerated by managers. Bell et al. (2003) express a need to understand this age group better, their motives and problems or issues, and to understand more about the perceptions of what is classified as abuse and why it takes place.

Managers may need to accept that a controlled level of woodland damage is an acceptable price to pay for the social benefits achieved by provision for, and tolerance of, a greater range of uses (Bell et al., 2003). Knopf and Andereck (2004) also argue that there should be less focus on blaming individuals and more focus on the systems which provide services to the individual. Soft and positive intervention strategies can solve many of the challenges faced by natural resource managers (Knopf and Andereck, 2004)

Jollands et al. (2011) reported on 'The Wildfire in Wales' project, delivered by Forest Research and funded by the former Forestry Commission Wales, South Wales Fire and Rescue Service, and Mid and West Wales Fire and Rescue Service. Wildfires are a persistent, widespread, costly and dangerous issue in South Wales. Between 2000 and 2008 there were over 55,000 recorded grassfires and nearly 550 forest fires in South Wales; this equates to eight times more per unit area than in the United Kingdom as a whole. It is estimated that each wildfire costs between £1,000 and £1,950 in Fire and Rescue Service time and resources. South Wales Fire and Rescue Service estimate an annual cost in their service area of around £7m due solely to wildfires. Added to this is the fact that firefighters engaged in extinguishing wildfires are unavailable to respond to other emergency calls, meaning lives are potentially put at risk.

Wildfires are more likely to occur in the most deprived areas of South Wales, as measured by the Welsh Index of Multiple Deprivation, with the areas particularly prone to wildfire arson being the Rhondda Valley, and Afan Valley.

Supporting the findings in other literature, young people are regarded as primarily responsible for committing wildfire arson in South Wales, although in areas to the west of Coed y Cymoedd, stakeholders are more likely to blame farmers or landowners. Jollands et al. (2011) state that the primary motivations for wildfire arson include to relieve boredom, for land clearance, for fun, part of associated criminality, an act of rebellion, or due to psychological pressures, i.e. mental health issues. It is therefore a complex social issue unlikely to be eliminated easily. The authors also state that understanding these categories will help inform future mitigation strategies. Overall, fire setting in South Wales should be viewed as part of wider socio-economic problems such as deprivation and a comparative lack of financial and service investment in the area.

In 2005 an example of a publicity campaign targeted at reducing negative incidences was presented (O'Brien and Tabbush, 2005). Coed Y Cymoedd Forest District dealt with over 200 fire incidents each year, of which 99 per cent were started deliberately. This area had more forest fires than the rest of Great Britain put together. Former Forestry Commission Wales identified initiatives which could have a positive impact on trying to reduce these incidences. These included:

- Educational visits and 'Crucial Crew' (a presentation by FC staff on the dangers of fires and the impacts on wildlife and the environment) are part of an initiative organised by local authorities, emergency services and utilities to encourage responsible and safe attitudes to possible dangers. These target 3000 young people in year 6 junior school every year.

- Supporting other agencies such as the South Wales Fire and Rescue Service through their 'Fire tan' website and education programme.

- Better forest security.

- Anti-arson campaign in targeted areas (O'Brien and Tabbush, 2005, p36).

(See also Section 6.2 – negative impacts of Covid-19)

7.4 FLY-TIPPING

Fly-tipping is a major issue, particularly in urban woods and can result in considerable annual expenditure. Fly-tipping is putting litter or waste anywhere where it does not belong. Fly-tipping includes anything from three-piece suites, old mattresses and builders' waste through to bags of household rubbish and garden waste. Besides the obvious negative impact on the appearance of the wood, fly-tipping can also include materials hazardous to both humans and wildlife. Sites with large amounts of litter are perceived as badly cared for and neglected, but this is often not the case (Woodland Trust, 2020) (See Section 7.7 – poor maintenance). The Woodland Trust (2020) have provided management guidance on litter and fly-tipping which suggests that involving the local community is often the key to dealing with litter and fly-tipping in urban woods:

> *"Contact with the community shows them that the landowner has a local representative who is monitoring the woodland, and that the litter or fly-tipping problem is not a lost cause. Do not forget many of the locals are probably as keen to tackle the issue as you are, involving them can help to create a sense of ownership and responsibility in the community that will, in turn, benefit the wood" (Woodland Trust, 2020, p7).*

(See Section 7.3 – anti-social behaviour.)

7.5 TIMBER HAULAGE

Road transport is the most important means of timber transport in Britain and over 90% of all timber is delivered to processing plants by lorry. The volume of timber produced each year from British forests is forecast to rise to 13 million cubic metres by 2030. Developing a safe and efficient timber transport system is therefore essential to the continued success of the forest industry (Timber Transport Forum, 2020). Timber haulage sometimes involves using rural roads that are not well suited to modern haulage vehicles. The roads may be structurally weak or very narrow with limited passing places. Lorries may pass close to

residential areas and local schools with the potential to impact adversely on communities and other road users (Timber Transport Forum, 2019).

Timber haulage is a major interface between the forest industry and the public. Therefore, community concerns must be addressed constructively, or they can negatively affect both local operations and the perception of the industry as a whole (Timber Transport Forum, 2019). In March 2002, the Wales Timber Transport Group[22] was created in response to increasing concern from local communities in particular about the rising volume of timber leaving the forests of Wales and the associated lorry traffic. The group (alongside a GB-wide Timber Transport Forum) promote a range of measures to improve the sustainability of timber transport by producing Agreed Route Maps (in place for some parts of Wales) and through the continuing development of good practice, e.g. Cwm Henog to Esgair – Dafydd Haul Road[23].

7.6 TREE FELLING

The literature on the negative impacts on tree felling is focused on the environmental rather than the societal impacts. The societal impacts of tree felling is an area of research which needs more investigation.

The Woodland Trust (2003) discuss the challenges of thinning and felling operations, which they say, can look devastating to members of the general public.

> *"What was a quiet, tranquil wood is now full of large, noisy machinery making a mess and cutting down trees. Even when the operation is over, the wheel ruts, mud and brash can look unsightly for a year or two"'* (Woodland Trust, 2003, p6).

The Woodland Trust (2003) emphasise the need to inform the public about planned operations and reforestation work. This should help to prevent complaints, as well as fly tipping or more serious forms of vandalism, if the wood looks to be degraded and neglected. Other issues which also need to be considered and mitigated during felling operations include health and safety, temporary path closures, noise, and disruption.

Tree felling may be necessary not only for harvesting at maturity, but also due to pests and diseases. Boyd et al. (2013) recognises that trees and forests are of enormous importance for individuals who cherish particular landscapes, and tree species. Boyd et al. (2013) consider that the loss of iconic tree species to pests and diseases, such as chestnut blight, Dutch elm disease, and ash dieback, is one of the greatest harms to cultural services and societal benefit.

7.7 POOR MAINTENANCE

The Royal Forestry Society (2019) state that the UK woodlands which people value are not an accident of nature but the product of long-term management, often over many generations. They argue that unmanaged and poorly maintained woods are not attractive or welcoming places to visit. The Royal Forestry Society (2019) stresses the effort needed to

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[22] https://timbertransportforum.org.uk/groups/wales
[23] https://timbertransportforum.org.uk/attachments/article/94/TTF Publication 2014 Tywi Forest Timber Transport Forum Case Study.pdf

nurture the next generation of big trees in the landscape and warns that without it, cherished wooded landscapes will become degraded.

The study by Bell et al. (2003) found that woodlands which appeared to be unmanaged were the main targets for abuse (See section 7.3 – anti-social behaviour). A paper by Maruthaveeran and Konijnendijk (2014) systematically reviewed the attributes that evoke fear of crime in urban green spaces (See section 7.10 – safety concerns). The majority of the studies highlighted that individual factors, such as gender and past experience, were the most influential in evoking fear of crime, but social and physical factors were also identified. Physical factors include physical incivilities, e.g. vandalism, litter, graffiti, as well as poor maintenance, such as unmaintained grass/shrubs. Signs of disorder will deter people from spending time in urban green spaces, because they generate suspicion and distrust (Skogan and Maxfield,1981, cited by Maruthaveeran and Konijnendijk, 2014).

Poor maintenance and design of a place will also influence crime and perceived safety, e.g. by resulting in more signs of disorder, less visual access, and lower social control (Zelinka and Brennan, 2001, cited by Maruthaveeran and Konijnendijk, 2014). Poor maintenance will also indicate to criminals that an area is not managed or cared for (Crank et al., 2003, Maruthaveeran and Konijnendijk (2014). Lindgren and Nilsen (2012) also note that an urban green area that is not managed can be perceived not only as unpleasant and ugly, but also as a potential site for a criminal to hide. This is also supported by O'Brien (2005) who states that woodlands that appeared to be neglected or abused seem to generate greater feelings of discomfort over people's sense of personal safety.

As well as physical incivilities (Maruthaveeran and Konijnendijk, 2014) problems of unmanaged and poorly maintained woodland identified by Llais y goedwig [24] included:

- Trees often develop poor growth and are prone to leaning and falling in wind, potentially damaging fences and property.

- Rights of Way become overgrown or blocked with fallen trees, resulting in walkers and horse riders straying off the path.

- Trees can also cause problems to neighbours by shading out the sun, dumping leaves in autumn or blocking views and TV signals (See Section 7.2 – disadvantage of street trees).

Bell et al. (2003) conclude that a greater management presence can make a big difference to people's feelings of safety, as the signs of abuse are less likely to be present; but management does not necessarily have to be carried out by formal owners or authorities, as local people's sense of ownership is also important. An example is Sirhowy Woodlands in Tredegar, Blaenau Gwent, where a community group, made up of local residents, was formed in 2016 to help look after the woodland and apply for funding for improvements following funding cuts to Blaenau Gwent Local Authority. The woodland, a reclaimed spoil and refuse tip, was a popular area for dog walkers, but had become neglected, and was attracting anti-social behaviour, including off road vehicles and motorbikes [25]

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[24] https://llaisygoedwig.org.uk/
[25] https://www.sirhowyhillwoodlands.co.uk/history-of-the-woodlands/

7.8 COMMERCIAL FORESTRY

Not all woodlands and forests are viewed as a positive contribution to the landscape by all communities. In particular, commercial conifer plantations in south Wales have been described as dark, unwelcoming places, where the trees provide secrecy for antisocial behaviour (Bishop et al., 2002). Other words used to describe these plantations in the past are "alien' and 'gloomy", and although still considered to be a natural space, this is something that is beyond their own built and social environments (Bishop et al., 2002).

7.9 RECREATIONAL USE AND WILDLIFE DISTURBANCE

The pursuit of recreational activities in UK forests is increasingly popular and provides many social and economic benefits. However, such activities can have significant impacts on the natural environment and wildlife (Marzano & Dandy, 2012). Land managers, especially in the public sector, have to balance the delivery of social and economic benefits with the requirement to promote nature conservation.

A literature review by Marzano & Dandy (2012) provided an overview of wildlife and habitat disturbance issues and impacts, focusing on recreational activities undertaken in UK forests including walking and hiking, cycling and mountain biking, off-roading, horse riding, camping and nature watching. Key findings showed that disturbance caused by walking (the most popular recreational activity in UK woods and forests) was the main focus of the literature. This related to damage through trampling, including vegetation damage/abrasion, reduced vegetation cover, reduced plant species density, decreased leaf litter biomass, and increased trail width and depth. Erosion and trampling of vegetation were the main impacts on the environment from cycling and mountain biking, as well as horse riding.

Activities such as camping, nature watching, and picnicking were shown to cause behaviour change in animals, which are attracted to food sources left by people. Nature watching was seen as particularly intrusive, involving viewing, touching, feeding, or photographing wildlife. The spread of harmful species or pathogens was also a concern, which could be carried into the forest by footwear, vehicles and bicycle tyres, and also to a lesser extent, by horses (Marzano & Dandy, 2012).

7.10 SAFETY CONCERNS

In South Wales, as already described, areas of forest exist in conjunction with former mining areas. Several safety concerns are associated with disused colliery spoil heaps, quarries and former mining structures, including landslides and environmental issues, such as water pollution (Bentley and Siddle, 1996). In 2019, Peter Cloke, South Wales Deputy Forest District Manager for Natural Resources Wales, said:

> *"South Wales is unique in the fact we have such large numbers of people living next to our forests and using them for daily recreation, but due to our coal and steel industrial past we have many legacy issues to manage to ensure we keep them safe"* [26]

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[26] https://www.gov.uk/government/news/colliery-tips-in-south-wales-to-be-inspected-over-next-5-years

At the seminar already referred to, addressing crime and safety issues (O'Brien and Tabbush, 2005) tree cover and community safety was also discussed as a significant issue. At the seminar, Mark Johnston (Lecturer and Research Associate, Myerscough College) stated that this issue generated considerable concern among urban residents in particular, with many local authority tree officers reporting greater numbers of requests from individual residents and community groups for tree maintenance work which they believed would reduce the risk of crimes, such as mugging, burglary or indecent exposure, or discourage anti-social behaviour (Johnston, cited by O'Brien and Tabbush, 2005).

Safety issues (actual and perceived) was a theme identified by O'Brien (2005) in a study which focused on the social and cultural values of woodlands and trees in both urban and rural areas in the north-west and south-east of England. In-depth discussion groups revealed that safety was an issue for women in all of the groups and further evidence of this was identified in a synthesis of 20 studies by Morris et al. (2011). Most people liked to visit woodland or forest in the company of other people, or at least with their dogs, as they felt uncomfortable on their own. This was particularly the case for women in the more urban areas. Four women in both Liverpool and Southampton spoke of being accosted by 'flashers' (men who indecently expose themselves) in the past or verbally harassed, although not necessarily in woodlands, and this had made them wary of who might be lurking in and around greenspaces (O'Brien, 2005).

Media stories of high-profile murders also remained in people's minds (Fox, cited by O'Brien and Tabbush, 2005), and safety concerns were also preventing children from being allowed to go into the woods unsupervised. Bell et al. (2003) highlighted the importance of childhood experiences of woodlands and natural spaces and described how children who used these spaces were more likely to become adults who enjoyed woodlands.

8 INTEGRATED ASSESSMENT TABLE

As referred to previously in this report.

Key:

- Blue = Consensus from evidence that benefits will accrue
- Amber = Some disagreement / conflicting evidence
- Pink = Consensus from evidence that benefits are unlikely
- White = no evidence found

Review section number →	3.1	3.2	3.3	4.1
Social benefit →	Mental health	Physical health	Health inequalities	Social capital
TWF type and/ or location ↓				
Community woodland	+	+		+++
National forest estate	+	++		-
Urban trees	-/+	++	-/+	-/+
Other greenspace	+	++		

Notes:
'+'s indicate strength of benefit
'-'s indicate strength of disbenefit
'0' indicates no net benefit
'+/-' indicates where both benefits and disbenefits can be realised (by definition this is an Amber code)
'0/-' indicates no net benefit or potential for disbenefit

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