

Research Report

The current state of ancient woodland restoration

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WOODLAND
TRUST

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Executive summary

The protection and restoration of ancient woodlands was the founding objective of the Woodland Trust in the 1970s and remains a key aim today. This report seeks to draw together recent evidence and information on the progress and challenges associated with restoring damaged ancient woodlands across the UK in order to inform the Trust's future direction and strategy. It is based on a systematic and comprehensive review of relevant literature and analysis of findings.

Current status

Ancient woodland is defined as woodland that has been in continuous existence since 1600 in England, Wales and Northern Ireland, and 1750 in Scotland. It can be sub-divided into Ancient Semi-Natural Woodland (ASNW) and Plantations on Ancient Woodland Sites (PAWS). The extent and distribution of ancient woodland is based on the Ancient Woodland Inventory (AWI). However, there are significant differences in interpretation between countries as to what is and is not regarded as ancient woodland; Long Established Woodlands of Plantation Origin (LEPOs) and 'Other Roy' woods are regarded as PAWS in Scotland, as are long-established woods in Northern Ireland.

Being clear on the definition(s) of ancient woodland is key. While there may be a case for an ambiguous definition, this is not helpful when policy and practice demands black and white definitions and hard lines on maps. A clear definition is also essential if additional protection of ancient woodlands is to be sought.

Ancient woodland covers around 585,000ha, or 18.5% of the UK's woodland area and 2.4% of the UK's land area. There is 358,000ha of ASNW (61%) and 227,000ha (39%) of PAWS in the UK. The majority of ancient woodland (including PAWS) is located in England (59%). These ancient woodlands are unique and provide a wide range of environmental, historical and cultural benefits.

There is an urgency now to PAWS restoration. Ancient woodland features are deteriorating or being lost and conifer crops on PAWS are maturing and coming to the end of their rotation. There is need to safeguard remaining wildlife and historic features and restore these areas to rich Ancient Semi-Natural Woodlands before they are restocked with conifers or site inappropriate broadleaf species. It is acknowledged however that while it is urgent, PAWS restoration also takes time to implement and requires sustained commitment and effort.

Woodland Trust's impact

The Woodland Trust has been involved with ancient woodland restoration since its establishment in the 1970s, and in recent years has accelerated and prioritised the extent of restoration undertaken. It is estimated that the Trust has restored or started restoring 3,770ha of PAWS on its own estate and has helped private woodland owners to commit to restoration of a further 22,586ha in recent years. This makes

a total of 26,356ha which is being restored or is committed to restoration as a result of the Trust's activities, equivalent to 11% of PAWS land across the UK. It is also important to recognise the Trust's work in influencing forestry grant schemes, the UK Forestry Standard (UKFS) and UK Woodland Assurance Standard (UKWAS), which underpin the maintenance and enhancement of PAWS in the 43% of woodland in the UK which is certified.

Looking ahead, the majority of ancient woodland restoration will take place on private land and on the Public Forest Estate (PFE). The Trust has a key role to play in terms of leading, encouraging and influencing this by holding landowners and managers to account to UKWAS. This will be supported by the work which the Trust undertakes on its own estate, including research, best practice and demonstration.

The Trust is on a learning curve, in terms of engaging with landowners and intermediaries. With the right support, the Trust can develop and improve this work, thereby increasing the quantity and quality of ancient woodland restoration being undertaken on private land. Questions going forward include: what happens at the end of the Heritage Lottery Fund project in 2018; on what and where should the Trust focus its effort in terms of landowner engagement; and to what extent should it partner and influence partner organisations to do this work. In other words, what is the Trust's USP (unique selling point)?

Developing partnerships with other organisations has proved effective and it would be worthwhile extending this approach across both privately and publicly owned woodland. There is a need to be clear on which partnerships have worked best, and understand the key success factors.

Future challenges

The external context for ancient woodland restoration is challenging on a number of fronts, including: relatively weak policies and protection; lack of quantitative targets; lack of data; inadequate grants; an under-appreciated and under-valued asset; and a range of environmental and other pressures on site. Furthermore this context is constantly changing. Presently there is a small 'carrot' - with an uncertain future (post-Brexit) - and only a small 'stick' providing the impetus for ancient woodland restoration.

Recommendations

A number of recommendations are made for the consideration of the Trust:

- **Strategy.** An overarching strategy for the protection and restoration of ancient woodland would be beneficial, and should be a core part of the Trust's overall approach and programme. This strategy would raise awareness of, and campaign to improve, weak areas as set out in the following points.
- **Ancient Woodland Inventory.** The AWI should ideally be updated across the UK to provide a robust, consistent baseline. However, an AWI update could be demanding in terms of resources and a prerequisite would be

clarification of definitions of ancient woodland. A pragmatic, short-term approach could be to accept and acknowledge existing weaknesses and focus effort on the most important woodlands, for example those of significant ecological importance.

- **Ancient woodland condition.** Information on key features and the condition of individual woodlands should ideally be provided alongside information on location and area as set out in digital maps (such as that available for designated wildlife sites). This data would help inform and guide woodland owners and managers, although it is recognised that it would take time to achieve.
- **Policies and targets.** Forestry and biodiversity policies should be strengthened, with specific commitments and quantified targets for ancient woodland restoration across the UK, on both public and private land, to agreed timescales. It is acknowledged that some countries are better than others in respect of policies and targets; for example, Scotland has reasonably strong policies and some targets.
- **Protection.** Additional protection for ancient woodland should be provided. Options include promoting a specific legal designation for ancient woodland and developing felling licence conditions favourable to conservation and restoration. It is acknowledged that definitions would need to be clarified and the case for additional protection would need to be supported by clear evidence of significant loss and damage under the current system.
- **Planners' awareness.** Planners' awareness of ancient woodlands, including PAWS, should be raised in order to help protect them from adverse planning decisions.
- **Grants and funding.** The uptake and performance of the current grant schemes/options should be kept under review and improvements sought where necessary. Current shortcomings such as limits on options/budgets for restocking PAWS in England, Wales and Scotland need to be addressed. As grants decrease, alternative funding mechanisms need to be explored and developed, for example, externally funded projects, Payments for Ecosystem Services (PES) schemes and crowd or community funding.
- **Engagement with owners and intermediaries.** This effort needs to continue and be extended, particularly to agents/advisers, managers and others in the forestry supply chain. The support and resources provided should be kept under review and adapted as required; this might include more training and information and, for small woodland owners, further support during implementation. Other bodies which deal with the majority of woodland owners on a day-to-day basis should be encouraged to do their bit and be supported by the Trust (e.g. with resources, demonstration, training etc.) thereby increasing the Trust's reach.
- **Partnerships.** Existing partnerships should be continued and new partnerships developed to promote PAWS restoration on both private and public land. Promoting and encouraging PAWS restoration on the PFE, and holding the Forestry Commission (FC)/Forest Service Northern Ireland (FS(NI)) to account, presents a particularly important opportunity given the scale of the resource.
- **Demonstration.** Good practice should be demonstrated both on and off the Trust's estate through a network of sites across the UK. The Trust should ensure that its whole estate is an exemplar of best practice.
- **Approaches.** Alternative silvicultural systems that involve natural regeneration should be considered. The adoption of Continuous Cover Forestry (CFF) based systems is likely to be more conducive to AWR than previous regimes.
- **Evidence.** The gaps in evidence relating to ancient woodlands and ancient woodland restoration need to be filled in order to inform and guide future work. This would benefit from co-ordination of research and analysis with forestry bodies and countryside agencies amongst others. This could include long-term scientific monitoring (e.g. soils), repeat surveys of owners and agents, and using volunteers to gather anecdotal evidence to support the Trust's work (e.g. case studies).
- **Monitoring.** Data on the extent of ASNW and PAWS, the amount of ancient woodland being restored, and the proportion in favourable condition should be maintained and reported on at least every five years.

Introduction

Background

The protection and restoration of ancient woodlands was the founding objective of the Woodland Trust in the 1970s and remains a key aim today. In recent years the Trust has developed a number of area-based projects across the UK aiming to encourage private landowners to restore Plantations on Ancient Woodland Sites (PAWS) to protect remnant ancient woodland features and to restore semi-natural woodland. The Trust has also undertaken a significant amount of PAWS restoration on its own estate.

Aim

The aim of this report is to draw together recent evidence and information on the progress and challenges associated with restoring damaged ancient woodlands across the UK.

The report covers the availability and effectiveness of policy, regulatory and incentives frameworks for restoration, and the role of forest industry standards. It also summarises the ecological, economic and social impacts of restoration, as far as evidence permits, and the effect of external threats such as pests, diseases and climate change. The report focuses on policy and practice, as opposed to the science underpinning restoration. Gaps in the availability, quality or focus of information and evidence are identified.

The report makes recommendations for the Woodland Trust's future direction and strategy for ancient woodland restoration activity, and provides information for other bodies involved in ancient woodland restoration.

Approach

The approach taken included the following tasks: inception meeting; systematic and comprehensive review of relevant literature; analysis of findings; generation of recommendations; and reporting.

Jim Smith-Wright/WTTML



Current status, protection and ambition for ancient woodlands in policy

Definitions

Ancient woodland is widely defined in England, Wales and Northern Ireland as “land that has shown a continuity of woodland cover since at least 1600” and in Scotland as “land that is currently wooded and has been continually wooded, at least since 1750”.

Strictly speaking neither of these descriptions of ancient woodland is correct. The threshold date (whether 1600 or 1750) refers to the date of evidence rather than acting as a definition in itself. 1600 was selected as the threshold date in all countries since it was considered possible to find reliable map evidence for a woodland from around this time and that a woodland existing at this time was unlikely to be planted. In Scotland, the threshold date was revised to 1750 to take account of the fact that the Roy Military map, the first reasonably comprehensive mapping of the country, dates from this time.

The extent and distribution of ancient woodland is based on the Ancient Woodland Inventory (AWI), which was first developed in the 1980s by comparing current and historical maps and drawing on other sources of evidence. While the AWIs were an ambitious and admirable piece of work their limitations regarding accuracy are well known:

- only woodlands over 2ha in size were included;
- technology was basic by today’s standards, with potential for human error in the original maps and subsequent digitising process;
- most wood-pasture sites were omitted;
- the Roy maps used in Scotland are very variable in their accuracy across Scotland and more remote areas were never actually surveyed;
- the green wash used on Roy maps to denote general woodland areas was not recognised in black and white photocopies used for the inventory; and
- resources did not stretch to detailed archive work to trace the history of woods back beyond baseline maps (Roy and OS) in most cases.

There are therefore many woods that are not on the AWIs which are probably ancient and some woodland on the AWIs that is probably not ancient, or has been inaccurately mapped. To add to the potential sources of confusion when interpreting the AWIs, particularly in Scotland:

- the uplands were not only poorly mapped but also the boundaries of where woodland meets other semi-natural habitats are difficult to define;
- in England, Wales and Scotland, woods that appeared on the baseline maps were assumed ancient unless proven otherwise;
- in Scotland, this was refined slightly by inclusion of Long

Established Woodlands of Plantation Origin (LEPOs) and ‘Other Roy’ woods, which appeared on the Roy maps but not on the OS first edition (some of these may be ancient and some may not); and

- in Northern Ireland, all woods that appear on the OS 1830s maps are assumed to be long-established (arising between 1600 and 1830) unless there is reasonable evidence that they are older. This was because of the different land use history in Northern Ireland.

The AWIs are managed by the statutory countryside agencies: Natural England (NE), Natural Resources Wales (NRW), Scottish Natural Heritage (SNH) and the Northern Ireland Environment Agency (NIEA). While updates have been undertaken in Wales and in some parts of England (South East England and Herefordshire for example), this has not been the case in Scotland or elsewhere.

The result is a lack of clarity regarding what is and is not ancient woodland, and under-reporting of ancient woodland. Difficulties arise because ‘ancient woodland’ is essentially an ambiguous term, yet it is used extensively in areas of policy and practice that demand black and white definitions and hard lines on maps, in particular in development control. One option is to agree a suitable description, use it consistently to avoid future confusion and support this with training and communication.

Ancient woodland, (however described) can be sub-divided into two types:

- Ancient Semi-Natural Woodland. Ancient semi-natural stands are those that are composed predominantly of trees and shrubs native to the site that do not obviously originate from planting. They include stands that may have been managed by coppicing or pollarding in the past, as well as those where the tree and shrub layer has grown up by natural regeneration which is composed of native trees and shrubs, though it may have been previously managed.
- Plantations on Ancient Woodland Sites. These are areas of ancient woodland where the original native tree cover has been felled and replaced by planted stock most commonly of a species not native to the site, for example conifers such as Douglas fir, western hemlock or larch, but also broadleaves such as beech outside its native range.

The division between semi-natural stands and plantations is not always easy to define because there are intermediates. Examples include small clearings within woods, old plantations of native species, semi-natural structured stands of introduced species, planted conifer stands that now contain a proportion of self-sown native broadleaves, semi-natural tree layers with no native understorey or an understorey of non-native invasive plants (e.g. rhododendron, Gaultheria or snowberry) and wood-pasture sites planted with non-native conifers. Therefore, a judgement may be necessary as to the balance between the planted/introduced elements versus the native/naturally regenerating elements.

Current status and trends

Ancient woodland – based on the AWI and subject to the issues and concerns raised above – covers around 585,000ha, or 18.5% of the UK’s woodland area and 2.4% of the UK’s land area. A breakdown of ancient woodland by type and country is shown in Table 3-1. This shows that around

39% of the UK’s ancient woodland is planted with non-native species (PAWS). The majority of ancient woodland (including PAWS) is located in England (58%). However, the AWI considerably underestimates the area of ancient woodland especially in Scotland where it is estimated that there may be an additional 200,000ha of ancient woodland*.

Table 3-1: Area of ancient woodland in the UK (based on the AWI)²

Woodland type	England	Wales	Scotland	Northern Ireland	UK
thousand hectares					
ASNW	206	63	89	0	356
PAWS	135	32	59	1	227
Total ancient woodland	341 ³	95	148*	1	585
Total woodland	1,306	306	1,436	112	3,160

Up to date, aggregated data on the extent of ancient woodlands by country, and trends, are not routinely published. However the agencies provide digital maps which are available through data.gov.uk.

The Native Woodland Survey of Scotland (NWSS)⁴, carried out from 2006-2013, provides the first authoritative picture of Scotland’s native woodlands. This shows a total of 311,153ha of native woodland, comprising 22.5% of total woodland area (as at March 2011) or 4.0% of land area of Scotland. NWSS found 120,305ha of ancient woodland, with 65% being mainly native in composition. A comparison with the provisional AWI suggests a significant reduction in ancient woodland over a 40 year period of 21,044ha (14.2%) in mainly unenclosed upland areas. This is most likely due to a combination of herbivore pressures and the poor regeneration capacity of older trees, although more work is required to confirm the precise extent and causes of ancient woodland losses. There is no comprehensive data on the condition or quality of ancient woodlands in the UK, with a couple of exceptions:

- Sites that are designated as a Site/Area of Special Scientific Interest (SSSI or ASSI) or Special Area of Conservation (SAC), which cover approximately 21% of

the ancient woodland (ASNW) area⁵. While citations and condition assessments are available for individual designated sites, the last comprehensive report setting out the condition of woodland SSSIs/ASSIs and SACs across the UK as a whole was in 2006⁶. This indicated that 67% of SSSI features and 60% of SAC features for broadleaved and mixed woodlands (and 65% and 38% respectively for coniferous woodlands) were in favourable or unfavourable recovering condition. Unfortunately, there is no updated comprehensive UK report covering woodland SSSIs/ASSIs and SACs due to different UK country agencies adopting their own national approaches to conservation rather than an agreed UK approach. However, the Joint Nature Conservation Committee (JNCC) produced a UK-wide Article 17 Habitat Directive in 2013⁷ which reports on the condition of woodland SACs. This showed, for the ten woodland habitats listed in the Habitats Directive Annexes which occur in the UK, that all ten were described as ‘bad-improving’ in 2007 but that this had changed in 2013 to one described as ‘inadequate-stable’, five as ‘bad-stable’; and four as ‘bad-declining’; a worrying trend.

- Ancient woodland in Scotland. The NWSS shows that 40% of ancient semi-natural native woodland recorded on the

³Recent data from FC in 2015 (see Table 3-3), suggest a total of 366,000ha of ancient woodland in England, however there is no ASNW and PAWS breakdown of this figure available.

*Comment from Peter Lowe, WT: AWI data in Scotland excludes categories 2b and 3, mostly LEPOs (many of which are ASNW or PAWS), sites with rhododendron and sites with low canopy cover due to grazing or senescence.

AWI is in satisfactory condition for biodiversity. However, this is only a subset of the estimated total area of ancient woodland.

Ancient woodlands designated as Local Wildlife Sites (LWS) or Sites of Nature Conservation Interest (SNCIs) are likely to have been condition assessed by local authorities and/or Wildlife Trusts, but there is no comprehensive data.

The State of Nature Report 2016⁸ highlights mixed, but predominantly negative, long-term trends in woodland including: that 53% of woodland species have declined and 47% have increased; a 24% long-term decline in the index of change in the abundance and occupancy of woodland species; a 20% decline in the UK woodland bird indicator since 1970; and that 11% of woodland species are threatened with extinction from Great Britain.

The UK's varied climate and geology has led to a diversity of ancient woodland forms classified according to the variety and frequency of native trees present. The UK Biodiversity Action Plan (BAP) includes eight priority woodland habitats, seven of which are likely to be positively correlated to ancient woodlands but may also include more recent native woodlands. These include: lowland beech and yew woodland; native pine woodland; upland mixed ashwood; upland oakwood; wet woodland; mixed broadleaved woodland (lowland mixed deciduous woodland); and upland birchwood.

Each ancient woodland is unique with its own local soil, environment, wildlife and cultural history, and hence is irreplaceable. Many environmental and cultural benefits provided by ancient woods cannot be replicated by recently developed or planted woods, although some benefits are provided by all woodland types (see Table 3-2).

Table 3-2: Benefits of Ancient Woodland⁹

- The longevity and historical management of ancient woods have given rise to rich, distinctive communities of plants and animals, some of which are of international importance (e.g. lichen in Scottish ancient pinewoods).
- Ancient woodland soils are some of the least disturbed because of the longevity of vegetation cover and may preserve distinct species communities and natural ecological processes, such as decomposition and nutrient cycling.
- Ancient woods are often high in biodiversity, which can enhance the value of environmental and social wellbeing benefits of woods. They provide a refuge for biodiversity in a changing climate, and a source of colonisation for new woods.
- The soils and veteran or ancient trees in ancient woods are important carbon stores and may help to reduce net carbon emissions.
- Ancient woods are a rich historical, cultural and symbolic resource. They often contain archaeological relicts of previous ways of life, such as charcoal hearths or kilns. Veteran and ancient trees are also archaeological relicts, as their age and structure are often a result of past human use.
- Ancient woods are a huge learning resource – to allow learning about past environments and use as a baseline for future change.
- Like all green spaces, woods provide a range of social benefits for humans, including improving physical and mental wellbeing, and contributing to beautiful landscapes.
- All woods, including ancient and recently planted woods, can contribute to flood mitigation, fuel production, carbon sequestration and reduction of air and noise pollution.

Recent losses of ancient woodland have been captured by the FC as part of research into changes in woodland area and canopy cover over the period 2006-2015¹⁰. Permanent change in land use from woodland to other land uses, primarily mineral extraction or urban development, occurred on 3,279ha including 123ha (3.8%) comprising recognised ancient woodland sites; an average loss of 14ha per year. Temporary/indeterminate change is captured via 'apparent woodlands in transition' (areas clear-felled more than 12 months ago). There were 288,000ha apparent woodlands in transition in 2015, including 17,400ha (6.0%) on ancient woodland sites. Of these, it is estimated that 4,100ha occurred in areas designated ASNW and a further

13,300ha in areas designated as PAWS. The vast majority of these can be expected to be restocked as a condition of felling licences or grant scheme agreements. Reasons for change at any particular site may be PAWS restoration, normal silvicultural practice, disease, land-use change or natural decline. Breakdowns by country are shown in Table 3-3 below. This indicates clear-felling took place on 7% of all ancient woodland sites in Scotland, on 3% in Wales and on 1% in England. The situation, in terms of loss of ancient woodland, could well be worse than this, based on the analysis undertaken as part of the NWSS.

Table 3-3: Apparent woodlands in transition and new clearfell areas on ASNW and PAWS, as at March 2015^{vi}

	Clear-felled area in ancient semi-natural woodland sites	Clear-felled area in plantation on ancient woodland sites	Clear-felled area in ancient woodland sites	Total are of all ancient woodland sites	% of area of clear-fell	% of ancient woodland sites clear-felled
thousand hectares						
England	0.5	3.8	4.3	366.0	9	1
Scotland	1.5	8.5	10.0	148.2	5	7
Wales	2.1	0.9	3.0	95.0	9	3
Great Britain	4.1	13.3	17.4	609.1	6	3

Note, total ancient woodland figures slightly different to 2012 figures used in Table 3-1

The overall findings suggest habitat restoration is changing woods from within, and development activity is changing them at their edges. Most clear-felling is taking place in conifers, with large areas of conifer woodlands coming to maturity. Plant health and its management is also contributing to clear-felling, including responses to outbreaks of *Phytophthora ramorum* in larch for example. In both cases, there are openings for PAWS restoration, albeit not using the gradual approach advocated by the Woodland Trust.

There is an urgency now to PAWS restoration. Ancient woodland features are deteriorating or being lost and conifer crops on PAWS are maturing and coming to the end of their rotation. There is need to safeguard remaining wildlife and historic features and gradually restore these areas to rich Ancient Semi-Natural Woodlands, avoiding their restocking with conifers or inappropriate broadleaf species or their disappearance over time. It is acknowledged however that while it is urgent, PAWS restoration also takes time to implement and requires sustained commitment and effort.

Legislation, designation and protection

Ancient woodland has no statutory protection (unless it happens to be designated for its wildlife value) and is no different to other woodland in this sense.

Ancient woodland, like other woodland, is protected to an extent by the felling licence regime, whereby a felling licence is required for the felling of trees of licensable size for five or

more cubic metres per calendar quarter, under the Forestry Act 1967 (as amended). A felling licence will normally include conditions that the felled area must be restocked and the trees maintained for a period not exceeding ten years, however there appear to be no additional standard conditions applied to ancient woodlands (e.g. in respect of the nature and extent of felling and restocking/regeneration). Grant scheme contracts incorporate felling licences.

Ancient woodlands are also subject to the Environmental Impact Assessment (EIA) (Forestry) Regulations 1990 (as amended in 2006) whereby if the FC/FS(NI) decides that a forestry related project is likely to have a significant impact on the environment then consent is required. An environmental statement must be submitted as part of application for consent. Again, no special conditions apply in respect of ancient woodlands.

Some features in ancient woods are protected (see Table 3-4) and sites can also be designated for their wildlife value. Many ancient woods are designated LWS and are encompassed by the Biodiversity Action Plan list of priority habitats. Some sites also have statutory designation such as SSSIs or ASSIs, SACs and National Nature Reserves (NNRs)

Table 3-4: Legislation protecting features of ancient woodland⁹

- Trees can be protected from felling through Tree Preservation Orders.
- Many species that commonly inhabit ancient woods are protected by The EU Habitats Directive, The EU Wild Birds Directive, The Wildlife and Countryside Act 1981 (Great Britain) and The Wildlife (Northern Ireland) Order 1985, The Conservation of Habitats and Species Regulations 2010 (England & Wales), The Habitat Regulations 1994 (Scotland) and The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995.
- Archaeological relicts in ancient woods may be scheduled and protected by The Ancient Monuments and Archaeological Areas Act 1979 and The Historic Monuments and Archaeological Objects (Northern Ireland) Order.

Ancient woodland is explicitly mentioned in planning policy in Great Britain:

- English policy states that “planning permission should be refused for development resulting in the loss or deterioration of irreplaceable habitats, including ancient woodland... unless the need for, and benefits of, the development in that location clearly outweigh the loss”¹¹. This is echoed in the National Networks policy statement for developing nationally important infrastructure¹² and FC/NE Standing Advice for Ancient Woodland and Veteran Trees¹³.
- Scottish policy recognises that the value of ancient woods should be considered in planning decisions¹⁴.
- Welsh policy states that ancient woods should be protected from development that would result in significant damage¹⁵.

Implementing these policies can be challenging; the Woodland Trust is aware of 380 ancient woods under threat from development in England alone¹⁶ and 700 ancient woods under threat across the UK¹⁷ (at time of writing). One reason often cited is the difficulty of conclusively identifying and valuing ancient woods, although it is likely that other factors are as, if not more, important. This is not an issue in Northern Ireland, where planning policy does not specifically mention ancient woods, instead aiming to protect all existing woods “wherever possible”¹⁸.

Forestry policy and biodiversity strategies

UK forestry policy emphasises the importance of conserving ancient woods by improving and maintaining site condition, and restoring PAWS where possible; the exception is Northern Ireland forestry policy which does not specifically

refer to either ancient woodland or PAWS restoration. Relevant extracts relating to vision, aims, outcomes and targets are set out in Table 3-5. The Public Forest Estate, which accounts for an estimated 37% of all PAWS by area in the UK (see Table 3-6) also has ancient woodland restoration aims. Not all countries have targets however and where they do these are generally broad statements and not quantified.

Table 3 5: UK Forestry Policies/Strategies – references to ancient woodland restoration

England: *The Keepers of Time - A Statement of Policy for England's Ancient & Native Woodland* (Defra, 2005) and *The Government Forestry and Woodlands Policy Statement* (Defra, 2013):

Vision:

Ancient woodlands, veteran trees and other native woodlands are adequately protected, sustainably managed in a wider landscape context, and are providing a wide range of social, environmental and economic benefits to society.

Aims:

- Protecting our trees, woods and forests, especially our ancient woodland.
- Improving our valuable woodland assets, so that they can, among other things, benefit wildlife and the natural environment. This includes a commitment to work to improve and restore our native and ancient woodlands and open habitats through renewing our commitment to the policies set out in the Open Habitats Policy and *Keepers of Time*.

Targets (for 2020):

- The majority of ASNW either in favourable condition or being improved.
- The majority of PAWS either being improved or under gradual restoration to native woodland.
- 95% of woodland SSSIs in favourable or recovering condition (by 2010) – it has not been possible to check whether this has been achieved.

One aim for the Public Forest Estate in England is over time to restore the large majority of its ancient woodlands to native woodland, retaining the majority in productive silvicultural management (FCE, 2013).

Wales: *Woodlands for Wales – Strategy for Woodlands and Trees* (WAG, 2009)

Vision:

Wales will be known for its high quality woodlands that enhance the landscape, are appropriate to local conditions and have a diverse mixture of species and habitats. Ancient woodlands are not specifically referred to.

Aims/Outcomes:

- Woodlands and trees of special conservation value are in favourable management. This includes:
 - Woodland sites of international, national and local importance are in favourable ecological management.
 - All PAWS on our own woodland estate are prioritised for restoration, after considering the remnant evidence and wider ecological, landscape and cultural factors; and are gradually restored to a more natural state with ongoing management to improve their ecological condition and, where appropriate, to produce timber.
 - Other woodland owners are encouraged and supported to restore their PAWS.
- Woodland biodiversity is supported and native woodland is in favourable management. This includes:
 - The published BAP targets for native woodland to 2010 and beyond are met, including those for maintaining the net extent of native woodland; achieving favourable or recovering condition; and restoring and expanding a proportion of the native woodland resource.
 - There is better support for decision-making and management to improve the condition of priority native woodland habitats, and of woodlands that support priority species.

Targets:

Not specified, other than those indicated above.

Table continues on next page

Table 3-5: UK Forestry Policies/Strategies – references to ancient woodland restoration (continued)

<p>Scotland: Scottish Forestry Strategy (Scottish Executive, 2006)</p> <p>Vision:</p> <p>By the second half of the 21st century, most ancient, semi-natural woodlands and priority habitats are in, or nearing, favourable condition and restoration of native woodland on PAWS is well under way on the most worthwhile 70% of sites, with remnant native woodland communities maintained or enhanced on the remainder.</p> <p>Aims/outcomes:</p> <p>Reversing biodiversity decline by targeted action including:</p> <ul style="list-style-type: none"> • Restore and improve the condition of native woodlands and associated open habitats. • Maintain and enhance ancient woodland features on PAWS and restore to native woodland, at an ecologically appropriate pace, sites with a significant biodiversity legacy or at key locations in the native woodland habitats networks where the remnant ancient woodland plant communities are most at risk. <p>Targets:</p> <p>Not specified, other than those indicated above. However latest indicator figures, for the year 2013/14, include:</p> <ul style="list-style-type: none"> • Area of native woodland: 324,000ha; proportion of woodland SSSIs in favourable or unfavourable recovering condition: 68%; area of PAWS with a commitment to restoration under long-term plans: 39,900ha. • One aim for the National Forest Estate is to restore around 85% of areas on ancient woodland sites to largely native species, using where possible, techniques designed to maximise the survival of their rich assemblage of species. The remaining areas will be enhanced through management (FCS, 2013).
<p>Northern Ireland: Northern Ireland Forestry – A Strategy for Sustainability and Growth (DARD/FSNI, 2006)</p> <p>Vision:</p> <p>To meet the forest needs of present and future generations through improved sustainability of forests and an increased rate of afforestation.</p> <p>Aims:</p> <p>To improve the sustainable management of the forestry resource in Northern Ireland. Sustainable management is defined as meeting our current needs for wood production and economic activity, public access and environmental protection while at the same time safeguarding the resource for future generations.</p> <p>Targets:</p> <p>Not specified.</p>

Table 3-6: Estimated PAWS area on Public Forest Estate in the UK

	England	Wales	Scotland	Northern Ireland	UK
thousand hectares					
PFE area¹⁹	215	117	471	62	865
PFE PAWS area	43 ²⁰	13 ²¹	29 ²¹	<1	85
Total PAWS area (based on AWI)	135	32	59	1	227
PFE PAWS as % of total PAWS	32%	41%	49%	50% est. ²²	37%

UK Biodiversity Strategies support the protection and conservation of ancient woodland habitat. England, Scotland and Northern Ireland have targets for improving the condition of ancient woodlands (England refers to priority habitats; Scotland refers to native woodlands), and Wales supports this but does not have a specific target.

The restoration of degraded ecosystems is referred to in the strategies in Great Britain, but none of the strategies equate this to area or percentage targets for PAWS restoration. All of the strategies support the creation of new native woods (see Table 3-7).

Table 3-7: UK Biodiversity Strategies – references to ancient woodland restoration

England: Biodiversity 2020: a strategy for England’s wildlife and ecosystems services (Defra, 2011).

By 2020 we will have put in place measures so that biodiversity is maintained and enhanced, further degradation has been halted and where possible, restoration is underway, helping deliver more resilient and coherent ecological networks, and healthy and well-functioning ecosystems, which deliver multiple benefits for wildlife and people, including:

- Better wildlife habitats with 90% of priority habitats (including ancient woodlands) in favourable or recovering condition and at least 50% of SSSIs in favourable condition, while maintaining at least 95% in favourable or recovering condition;
- More, bigger and less fragmented areas for wildlife, with no net loss of priority habitat and an increase in the overall extent of priority habitats by at least 200,000 ha; and
- Restoring at least 15% of degraded ecosystems as a contribution to climate change mitigation and adaptation.

We are committed to providing appropriate protection to ancient woodlands and to more restoration of Plantations on Ancient Woodland Sites (in recognition of their particular value).

Wales: The Nature Recovery Plan for Wales: Setting the course for 2020 and beyond. Part 1: Our Strategy for Nature (WAG, 2015).

Objectives include to:

- Safeguard species and habitats of principal importance and improve their management; and
- Increase the resilience of our natural environment by restoring degraded habitats and habitat creation. Degraded habitats are ones which no longer support the full potential of our native wildlife. In order to safeguard our protected species and to improve the resilience of more widespread species and habitats, we need to restore networks of habitats to a healthy condition across Wales, both on land and in the sea.

Scotland: Scotland’s Biodiversity: A Route Map to 2020 (SG, 2015).

Big Steps for Nature and Priority Projects include:

- Ecosystem restoration – to reverse historical losses of habitats and ecosystems, to meet the Aichi target of restoring 15% of degraded ecosystems;
- Conserving wildlife in Scotland – to secure the future of priority habitats and species; and
- Sustainable management of land and freshwater – to ensure that environmental, social and economic elements are well balanced.

Priority Project 2 - Restoration of native woodland:

Aim:

- Improve the condition and extent of existing native woodlands and further increase new woodland planting.

Targets:

- Increase the amount of native woodland in good condition (upwards from 46% as identified by the Native Woodland Survey of Scotland)
- 3,000 to 5,000ha of new native woodland creation per year.
- Restore approximately 10,000ha of native woodland into satisfactory condition in partnership with private woodland owners through Deer Management Plans.

Table continues on next page

Table 3-7: UK Biodiversity Strategies – references to ancient woodland restoration (continued)

Northern Ireland: Valuing Nature: a strategy for biodiversity for Northern Ireland toward 2020 (DOENI, 2015).

- Consider expanding native woodlands by creating new woods, restoring native woodland sites and converting non-native woodlands; concentrate on areas that will enhance existing Ancient Semi-Natural Woodlands and, where possible, include sites large enough to overcome edge effects.
- On PAWS ensure that features of ancient woodland remnants are protected and consider progressive restoration to native woodland.
- Target: restore 240ha of ancient woodland by 2018 (led by the Woodland Trust).

Forestry industry standards

The United Kingdom Forestry Standard (UKFS)²³, which sets out the government’s approach to sustainable forest management, provides a reference standard for the forestry sector, underpins government grant schemes, and

encourages ancient woodland restoration in its guidelines on biodiversity (see Table 3-8). However the guidelines are open to interpretation and do not equate to either a legal requirement or good forestry practice requirement; instead the guidelines set out how UKFS requirements can be met.

Table 3-8: UKFS Guidelines – references to ancient woodlands

- Manage native woodlands to ensure their biodiversity is maintained or enhanced; base management proposals on protecting or extending semi-natural features and pay particular attention to Ancient Semi-Natural Woodlands.
- In Ancient Semi-Natural Woodlands, avoid introducing non-native species.
- Consider expanding native woodlands by creating new woods, restoring native woodland sites and converting non-native woodlands; concentrate on areas that will enhance existing Ancient Semi-Natural Woodlands and, where possible, include sites large enough to overcome edge effects.
- On PAWS, ensure that features of ancient woodland remnants are protected and consider progressive restoration to native woodland.

The United Kingdom Woodland Assurance Standard (UKWAS), which provides a practical basis for independent forest certification, also supports the conservation of ASNW

and PAWS. Extracts from the current standard (3.1) are set out in Table 3-9.

Table 3-9: UKWAS – references to ancient woodlands

- (Ancient) woodland shall not be converted to plantation or non-forested land. Areas converted from semi-natural and Ancient Semi-Natural Woodlands after 1985 shall not normally qualify for certification.
- Enhancement and/or restoration shall be a priority in ancient semi-natural woodlands and other semi-natural woodlands. Non-native species shall not be introduced or be allowed to become established in such woodlands... Management shall be in accordance with the UK Forestry Standard and the relevant FC practice guides for semi-natural woodlands.
- Adverse ecological impacts of non-native species shall be monitored in Ancient Semi-Natural Woodlands and other semi-natural woodlands.
- Evaluation. Owners/managers shall identify action which will progressively improve the biodiversity, environmental and cultural values of PAWS considering the site, landscape context and management objectives.
- Prioritisation. Owners/managers shall maintain and enhance remnant features of ancient woodland on all PAWS sites.

Table continues on next page

Table 3-9: UKWAS – references to ancient woodlands (continued)

- **Identifying management prescriptions.** Owners/managers shall identify management prescriptions to maintain ancient woodland features by addressing threats and ongoing decline on all PAWS.
- **Implementation.** Owners/managers shall implement management prescriptions to ensure that operations are implemented in a manner that does not adversely impact the sites' values.
- **Monitoring.** Owners/managers shall implement a monitoring plan that includes monitoring and reviewing the condition and response of remnant ancient woodland features.

Grants and funding

There is a variety of grants available for ancient woodland restoration across the UK (see Table 3-10). The differences between the countries is notable, with markedly different priorities, conditions and grant rates for PAWS restoration. There are now significantly higher management grant rates on offer via Countryside Stewardship in England but there has only been one year's operation and we understand that new Higher Tier woodland applications are now on hold due to Brexit. However there are now no restocking grants in

England and Wales other than following the felling of larch and other trees due to disease. These restocking grants fund both native and non-native tree species on ancient woodland sites, limiting their benefit for and potentially adversely affecting ancient woodland restoration. In Scotland, the budget available for woodland improvement (including improving the condition of native woodlands and restoring PAWS) is understood to be very limited. Data tracking 'PAWS restoration' grant uptake across the UK is not readily available, but would be beneficial.

Table 3-10: UK grants for ancient woodland restoration

England: Countryside Stewardship – Higher Tier

Woodland Improvement Multi-Year Option (WD2) - £100/ha/year

- **Priority Objectives:**
 - o Restoration of Plantations on Ancient Woodlands.
 - o Enhancing priority habitats.
 - o Enhancing priority species.
 - o Improving resilience to climate change through Continuous Cover Forestry.
- Management in accordance with a range of requirements, as informed by a Woodland Management Plan.

Supply and Plant Tree Option (TE4) – payments for restocking after a tree health issue

- Up to £3,500/ha for restocking ancient woodland sites with native tree species.
- Up to £1,750/ha for restocking ancient woodland sites with non-native tree species.
- A range of supporting capital items (e.g. deer fencing, rhododendron control and woodland infrastructure).

Wales: Glastir Woodlands

Glastir Woodlands has been designed to deliver environmental aims including contributing towards a reversal in the decline of Wales' native biodiversity. It includes:

- **Glastir Woodland Restoration** which has been developed to enable woodlands infected by *Phytophthora ramorum* or areas of larch felled to help slow the spread of the disease to be replanted.
 - o If the area to be restocked is a PAWS and located within the Woodland Primary Core or Primary Networks area, restocking must be with more than 80% native broadleaved tree species. Outside the Woodland Primary Core or Primary Networks area, the requirement is to restock with more than 50% native broadleaved tree species.
 - o The restocking grant for native broadleaved woodland is £2,770/ha (Capital Works Option 631). A range of other capital works grants are available.
- **Glastir Woodland Management** which previously offered grants for PAWS restoration elsewhere has, we understand, been discontinued.

Table continues on next page

Table 3-10: UK grants for ancient woodland restoration (continued)

Scotland: Forestry Grant Scheme

Sustainable Management of Forests

- Aims to support a range of activities in existing woodlands including:
 - Increase species and structural diversity through low impact silvicultural systems management (£30/ha/year).
 - Maintain native woodland, bring native woodlands and designated woodland features into active management and good ecological condition, and restore PAWS to native woodland through deer control and natural regeneration (£25/ha/year – for up to five years).

Woodland Improvement Grant – Habitats and Species

- Provides support for capital work to benefit a range of priority habitats and species. Its aims include improving the condition of native woodlands and restoring Plantations on Ancient Woodland Sites to native woodland.
- A list of capital items eligible for support is available (e.g. eradication of rhododendron and scrub, and deer fencing).

Northern Ireland: Forestry Grant Scheme

Forest Protection Scheme

- This scheme provides support for the prevention of pest and disease outbreaks and for restoration of forests following pest and disease outbreaks.
- This option is discretionary and support will be provided based on an appropriate appraisal submitted on a Forest Management Plan for a minimum 5 year period. Approved work will be paid at 100% of approved eligible costs with individual projects limited to £10,000 per application.

Woodland Investment Grant

- This grant supports sustainable forest management including the improvement of the environmental value of woodlands. Support may be made available for:
 - Restructuring woodland – to improve the ecological and environmental value of woodlands through the regeneration of forests by replanting. The aim is to encourage species diversity and improve the resilience of forests to climate change. A restocking grant of £600/ha is available.
 - Support for removing non-native and/or invasive species such as laurel and rhododendron as a one-off intervention. Approved work will be paid at 100% of approved eligible costs with individual projects limited to £10,000 per application.

In addition to woodland and forestry grants, funding for restoration is available through some schemes and projects run by bodies such as the Heritage Lottery Fund (HLF), Landfill Communities Fund and European Union (EU) (currently). For example, HLF's Landscape Partnership schemes have supported work on private land where there is evidence of sufficient public benefit and the restoration work is at a net cost to the landowner. EU-funded projects have included restoration work on private land (for example, Meirionnydd Oakwoods in Wales). Other potential funding sources include Payments for Ecosystem Services (PES) schemes and crowd funding.

Impact of the Woodland Trust's ancient woodland restoration projects to date

The Woodland Trust has been actively restoring ancient woodland around the UK since its inception in the 1970s. This section summarises the evidence on the nature, extent and impacts of this effort.

The Trust's work has involved ancient woodland restoration on its own estate and providing advice and support to private landowners to restore ancient woodland elsewhere.

Work on the Woodland Trust's own estate

The Woodland Trust's estate covers 24,700ha across the UK. Of this, 8,070ha (33%) is ancient woodland, including 4,300ha ASNW (18%) and 3,770ha PAWS (15%), (see Figure 4-1). All of the PAWS land is at various stages in the restoration process. Some of the latest acquisitions have only recently started the journey and some of the older woodlands have been under restoration for many years and are approaching the latter stages.

The Trust has used its estate to undertake ground-breaking research and develop the necessary techniques for the successful restoration of ancient woodlands. A gradual and pragmatic approach to restoration is championed and this approach has now gained support from a range of scientific and environmental institutions and industry bodies^{24 25}. There is a need for more research and evidence to develop the Trust's understanding for successful restoration across the board.

The lessons learned from the Trust's own estate are being shared with interested landowners through a demonstration programme with events being run around the country. Two high profile examples include: Fingle Woods, Devon with 169ha of ancient woodland and extensive areas of PAWS; and Wentwood, South Wales where ancient woodland is being restored following outbreaks of tree disease in the PAWS.

Work with private landowners

The Woodland Trust has successfully worked with expert local partners to promote and support ancient woodland restoration around the UK, and in 2013 launched the largest UK restoration project ever – the Ancient Woodland Restoration (AWR) project – thanks to a grant from HLF and support from partner organisations.

A map showing both HLF-funded and other project areas for ancient woodland restoration is shown in Figure 4-2. It is important to note that there is a wide range of other partnership restoration projects that have occurred in the past and that are currently ongoing. While the interim findings from the AWR project are readily available and are summarised below, it is important that lessons from these other projects are also captured to inform future strategy (these were not available during the course of this evidence review).

Ancient Woodland Restoration Project

The HLF-funded AWR project is a nationwide, landscape-scale project with two key purposes:

- To engage private landowners to encourage them to carry out restoration on ancient woodland sites in their ownership; and
- To raise awareness of ancient woodland among members of the public.

The project, which runs for five years from 2013 to 2018, is focused on ten priority areas where ancient woodland is urgently in need of restoration. Each area has a dedicated project officer to advise and support woodland owners and managers through the restoration process.

The total project cost is £2.9 million; this is supported by a £1.9 million HLF grant.

High level targets include:

- 1,200 landowners engaged with the topic of restoration.
- 20,940ha assessed for PAWS restoration.
- 9,340ha in the process of PAWS restoration.

The project is funding the following activities:

- Free advice to woodland owners and managers in the ten priority areas. This includes advice on what makes their woods special, the history of their site, the need for restoration and how to go about it.
- Expert guidance tailored to each site, ranging from technical management or signposting grants, to protecting archaeology and remnant woodland features.
- Training and networking events for owners and managers of PAWS, environmental professionals and contractors across all ten areas.
- Volunteer networks and activities. Activities range from site-specific and wider research, through to giving talks.

Alongside this, the Trust has developed a range of resources available through its website to support ancient woodland restoration. These include:

- Updated practical guidance and information on ancient woodland restoration²⁶.
- Case studies focused on ancient woodland restoration²⁷.

Key findings from the AWR project to date, based on an interim evaluation carried out by Icarus in mid-2016²⁸, are set out. This is a partial, interim picture in terms of outputs and outcomes, as data was not available for all the indicators. It should also be acknowledged that additional results will have been achieved since the date of the evaluation.

Heritage

- **Outputs.** 14,517ha has been assessed for PAWS restoration and 5,611ha is in the process of PAWS restoration. This is broadly on track; 70% of the assessment target has been achieved and 60% of the restoration target after around 60% of the duration of the project. Progress towards the land-based outputs has been achieved through contact with 420 landowners to date, representing only 35% of the target figure. This is a key indicator as positive engagement with woodland owners is crucial not just for the assessment and restoration targets, but also the practice-based outcomes.
- **Outcomes.** These focus largely on the knowledge and behaviour of those delivering restoration activity, including landowners, land agents and woodland contractors. The results are broadly encouraging. Feedback suggests that a wide variety of approaches and techniques are being used to contact, engage and encourage woodland owners to consider and learn about restoration:
 - Landowners report gaining new knowledge from their work with project officers, highlighting learning in specific techniques for restoration and management, species identification, and tactics and approaches for achieving restoration.
 - Feedback from events involving landowners, agents and advisers also indicates learning being gained by participants. This includes both those who are relatively new to this field, and those with more experience and pre-existing knowledge. The areas around which most learning was reported at events were: better knowledge of indicator species; learning about particular techniques or approaches to management and restoration; and a generally improved understanding of the importance of restoration.

People

- **Outputs.** The project was intended to create a large volume of products to contribute towards informing and educating people about AWR. These products include training, talks, events, web content, podcasts, video, on-site interpretation, toolkits, guidance documents and influence papers. The data available to date suggests that progress is modest in generating this range of resources. While 43 professionals have attended Continuing Professional Development (CPD) events (86% of target) just 305 landowners and professionals (14% of target) and no contractors (0% of a target of 150) have attended best practice PAWS restoration workshops. Evidence regarding volunteer outputs is more positive. The figures indicate that 85% of the anticipated number of volunteers have been recruited, and that those volunteers have contributed in the region of 62% of the Gift in Kind time anticipated.
- **Outcomes.** Feedback linked to volunteer satisfaction at this stage of the project is positive. The majority of those volunteers responding to the online survey indicated

a range of benefits from their involvement, including confidence, team working, feeling worthwhile, developing transferable skills and contributing to their local community. All the survey respondents indicated they had gained new knowledge and skill through their involvement. The impacts on the forestry and woodland workforce are largely unclear at present.

Communities

- **Outputs.** Two events involving 31 individuals have been held and community toolkits have been produced and published online.
- **Outcomes.** It is clear that the initial impetus towards the landowner engagement and assessment and restoration outputs has detracted from the value of other areas of work, including the community-related goals. However feedback from two events held over the period studied by the evaluation suggests these events engaged a knowledgeable audience, and provided good opportunities for learning about local woodlands.

Additional findings from the interim evaluation relevant to this report area are set out in below.

- The project is making a positive contribution to the growth of the Woodland Trust's profile and professional reputation with regards to AWR.
- There has been a significant amount of learning for the Woodland Trust about working with woodland owners and agents on AWR, particularly around the challenges of influencing decades of behaviour change.
 - It is worth noting however that a small number of interviewees made reference to a lack of knowledge about restoration within the Woodland Trust as a whole, referring to: little technical knowledge about the restoration process; lack of understanding that it is a 'hearts and minds' topic that requires behaviour change by woodland owners; little experience of engaging private landowners and the commercial forestry sector; and about the necessity for a long-term approach from both owners and the Trust.
- Project officers have employed a variety of methods in making contact with and engaging woodland owners.
- There is a high level of satisfaction among woodland owners about the way in which project officers have worked with them, as well as with the site report.
- Different delivery models are contributing positively to the project; however the evaluation suggests that no single model appears to be less effective or more difficult to work with.
- Working with partners has added value and depth to the AWR project.

Grant aid

- A key factor has been the absence of readily available grants for woodland restoration across the four nations.

These were in existence at the time the project was conceived and it was envisaged they would be a key driver to encourage woodland owners to engage with the project and to facilitate restoration.

- Different opinions have been expressed about the impact of this grant aid picture. For the majority of interviewees the absence of readily accessible grant funding has diminished the potential to initiate dialogue with woodland owners on the benefits of restoration. For some however, the lack of grant funding is not a substantive problem; the woodland owners who engage with the project are likely to be more committed.
- Almost half of the respondents to the woodland owner survey state that lack of funding is one factor that might affect their ability to progress restoration. However, it is not possible to quantify what proportion of owners have not engaged at all, or indeed more fully, with the project simply because of the lack of grant aid. Anecdotal feedback suggests it is likely that the lack of an incentive is a drawback and, for some woodland owners, means that restoration is not a feasible option.
- What the lack of grants does do is promote creative thinking about how the concept of restoration can benefit landowners, regardless of an immediate financial incentive. For example, one AWR manager commented “a lot of the auditing for Forestry Certification requires activity that is typically good for restoration so landowners have their own incentive for restoration – ‘a stick’ compared to ‘a carrot’ in terms of grant aid – and this has proved to be a successful mechanism for marketing the project.”

It is notable that there appears to be no recording or evaluation of either the ecological or economic impacts of the project; an assessment of both would be useful to inform landowners and funders in the future. There is also no assessment of how much PAWS restoration would have taken place anyway in the absence of the HLF project, i.e. the project's additionality; again this would be useful to determine in order to inform future prioritisation.

A review of the remaining PAWS resource in existing project areas conducted in late 2016²⁹ highlighted the following key findings for future consideration:

- There is sufficient PAWS resource left untouched in the project areas to continue at a similar level of delivery for at least a further 2-3 years. In a few areas those most open to the project have already been engaged so it may become increasingly difficult to persuade landowners to take up our offer. A (partial) summary of the potential for future delivery, in terms of the area of PAWS in private ownership in the project areas likely to be uncommitted to restoration by the end of the project in 2018, is set out in Table 4-1. The total figure will be higher, if data from all ten project areas is included, and if the PAWS restoration committed to by private woodland owners is not followed through into implementation for whatever reason.

Table 4-1: Committed and uncommitted PAWS in private ownership

		restoration* by the end of the AWR Project (ha)	restoration by the end of the AWR Project (ha)
Cairngorms	n.d.	n.d.	n.d.
Clwyd	2,593	500	2,093
Exmoor	n.d.	n.d.	n.d.
Great Glen	n.d.	41%	n.d.
Herefordshire & W Worcestershire	5,497	800	4,497
Low Weald	4,635 +	750	3,885 +
N Ireland	2,919	240	1,097
Powys	n.d.	n.d.	n.d.
S & W Yorkshire	2,589	700	1,889
W Mid Wales	n.d.	n.d.	n.d.
Total	>18,233	2,990	>13,461

Key: n.d. = no data available

- The HLF project has prompted interest from landowners nearby but outside the project area boundaries. These are potentially warmer prospects than would be found in a completely new area and resonates with the Trust's landscape-scale partnership initiatives.
- Continuing support and engagement with (at least some) landowners is required to ensure that work progresses beyond the management plan stage into actual restoration on the ground.
- Small to medium-sized landowners generally have a strong commitment to conservation and restoration for the sake of biodiversity and wildlife and may not necessarily be driven by economic factors, however they face many more barriers to implementing restoration and need much more hands-on support than some larger estates.
- Experience has shown that providing advice on the general management of ancient woodlands (including some broadleaved PAWS) acts as another hook to engage landowners with restoration.
- There may be a need for ongoing support in HLF and non-HLF project areas in order to build on what has been achieved to date and maximise the benefits.
- There is a clear need for further work influencing both the PFE and the decentralised country governments on improving grant provision. Lack of funding is a key barrier to preventing landowners from beginning restoration work on the ground (e.g. the owners of three PAWS in Clwyd all cited lack of funding as the main factor preventing restoration work).

*Committed to restoration means that the woodland and PAWS to be restored is included in an agreed management plan committed to by the owner.

The cumulative total of PAWS restoration on private land, influenced by the Trust since 2008, through HLF and non-HLF funded projects, is shown in Table 4-2. If the 3,770ha under restoration on the Trust's estate is added to the total of 22,586ha under restoration on private land, this suggests a total of at least 26,356ha of PAWS which the Trust has restored or started restoring itself, or helped private woodland owners to commit to restoration, in recent years. An important caveat is that 'committed to restoration' does not mean 'implemented'.

The Trust's work in influencing forestry grant schemes and UKFS and UKWAS standards should also be recognised. This work effectively underpins the maintenance and enhancement of PAWS in certified woodland, which extends to 43% of all woodland in the UK³⁰.

Table 4-2: Total area committed to PAWS restoration on private land supported by Woodland Trust activity

	Annual area (ha)
2008	3,401
2009	1,503
2010	2,702
2011	2,023
2012	1,412
2013	1,261
2014	1,495
2015	3,783
2016 (to end June)	3,511
Total to date	21,091

Other evidence

Additional evidence from a recent PAWS Conference in Wales³¹ run by the Trust is worth highlighting.

- Woodland owners' main reasons for not restoring PAWS, as identified by the participants (comprising a mix of statutory and independent forestry professionals, environmental professionals and woodland owners) include: cost/lack of grants/funds; concern about long-term economics after restoration; lack of knowledge/information/confidence; lack of interest; and poor access to site (see Figure 4-3). Some of these challenges are easier to deal with than others.
- The incentives necessary to encourage PAWS restoration, identified by the participants, included: grants; advice; long-term support (including developing local markets, quality assurance marks and Ecosystem Service Payments); and training (see Figure 4-4).

Threats, challenges and opportunities associated with ancient woodland restoration

This section summarises the threats, challenges and opportunities associated with ancient woodland restoration drawing on the report findings to date and additional evidence.

Policy. Forestry and conservation policies in the UK are broadly supportive of ancient woodland restoration, on both the PFE and private land, which is good. However they are weak on specifics and lack a sense of urgency. They do not specify the overall ASNW and PAWS resource and within this the priorities for restoration and underpinning rationale. Unsurprisingly, where targets are provided they are broad-brush and largely unquantified. Scotland has quantified targets and related indicators which it is monitoring; Wales and Northern Ireland are much less specific; and England is somewhere in between. The lack of specific policies, priorities, quantified targets (for both the PFE and private woodland) and indicators is likely to impact on initiatives and grant schemes which support ancient woodland restoration. This suggests a need for building a broader coalition of support, greater organisational buy-in and focused support from departments/agencies; this could link to future campaigns and engagement.

Industry standards. Forestry industry standards in the form of the UKFS and UKWAS encourage the protection, conservation and restoration of ancient woodland. They are commendable but arguably could be more specific and more forceful. Feedback from the Forestry Stewardship Auditors, SGS, suggests that the requirements for PAWS assessments, linked to certification, are beginning to have a significant impact on the thinking of the commercial forestry industry²³. Continued effort may be required to maintain and enhance standards, and avoid any weakening to reduce 'red tape' etc.

Markets. Improved timber prices have encouraged more management. In broadleaved woodlands, this has resulted in more thinnings to supply the firewood and biomass market, as well as fellings and thinnings for hardwood timber. In coniferous woodlands, better softwood prices and maturing stock have also encouraged more thinning and felling. This active management creates opportunities for the enhanced management of ASNWs and restoration of PAWS, but brings risks too in terms of the wrong kind of management in broadleaved areas and a desire to restock PAWS with commercially attractive conifers. Looking ahead, timber supply in the UK is due to peak around 2030 and then fall; this will support future timber prices. There is potential for ancient woodlands to make a contribution to and help supply more home-grown hardwood timber³². The restoration of conifer PAWS is also likely to impact on the availability of softwood, although the evidence on this is mixed. In Wales, a recent study noted that around 16% of Wales' softwood growing areas is PAWS and estimated that restoration of 70% of public sector and 50% of private sector PAWS would

probably lead to a reduction of less than 9% of currently-forecast timber volumes after fifty years³³. In Scotland, the vast majority of coniferised PAWS are on unsuitable or poorly accessed sites and restoration usually brings into management sites that have frequently been abandoned, and so brings extra softwood onto the market. Another driver is woodfuel; for example a major power plant in Kent is seeking 250,000m³ which could have a positive impact on the drive towards coppice production but a negative one in terms of rate of change for PAWS sites.

Grants and funding. The variety of grants available for ancient woodland restoration across the UK is complex, however more important for results on the ground is the availability of grants within countries. Previous grant schemes such as the Better Woodlands for Wales (BWW) scheme appear to have been fairly effective in supporting PAWS restoration, although only just over half involved full restoration to 100% native woodland³⁴. Data on the uptake and effectiveness of current grant options is not readily available, however evidence from the AWR project suggests that lack of funding and grants is a key barrier for many private woodland owners. Over half of the woodland owners surveyed for the AWR interim evaluation state that lack of funding is one factor that might affect their ability to progress with restoration²⁴. In England, there is now a more generous management grant, however for a variety of reasons there has been a low uptake of Countryside Stewardship; the recent moratorium on woodland applications linked to Brexit is adding to the problem. In England and Wales, restocking grants are now limited to restoration following disease and include conifer options, which is a potential threat. In Scotland, grants are available but the budget is limited. Looking ahead, there is considerable uncertainty regarding the nature and amount of future support for PAWS restoration following the vote to leave the EU. There may however be alternative ways to help fund ancient woodland restoration using new mechanisms such as PES schemes and crowd or community funding. Creative funding streams will be increasingly important in the future as grants decrease.

Engaging with woodland owners and intermediaries.

Engaging and working with woodland owners and intermediaries (managers, agents and consultants) is vital to PAWS restoration on private land. The Trust has put considerable effort into raising awareness, training, advising and supporting private owners through the AWR project and elsewhere, and producing a range of resources available through its website. The feedback is positive, with satisfaction from the owners and significant learning for the Trust. There remains a considerable way to go however in terms of reaching more landowners and engaging intermediaries (a key target audience for influencing management across a wider area and one where there is a need to build partnerships and not 'tread on toes'). Further improvements can also undoubtedly be made in terms of the approach, messages, training, advice and support provided to owners and intermediaries, including for example a network

of approved agents. Contractors too could be engaged to support restoration in small and medium-sized woodlands. Having PAWS-related specialist assessments has been shown to double the rate of subsequent implementation; conversely scrapping them later in the BWW scheme appears to have significantly reduced the rate of successful operations designed to restore PAWS²⁶. The importance of follow-up support has also been identified, particularly for smaller sites.

Aims and attitudes. The receptiveness of woodland owners and managers to PAWS restoration depends to a large extent on their aims and attitudes. Some woodland managers with conservation as a primary woodland management objective are prepared to spend time and resources in converting their woodlands, but other woodland managers are reluctant to do so without a better understanding of the financial implications, more evidence of benefits accrued and guidance on prioritising sites for conversion. Woodland managers with timber production as a primary objective are concerned that conversion will result in a reduction in sustainable levels of production, especially considering recent biosecurity threats to many native tree species; they are also concerned that competition and herbivory can affect conversion success³⁵. On the other hand, owners of larger estates in Scotland consider their entire forest resource (not just PAWS) and this presents an opportunity which has been taken up, particularly regarding certification of all their timber production.

Skills. There is a large skills gap in terms of ancient woodland restoration. A survey of woodland owners and agents in 2014³⁶ found that while most owners and agents were familiar with the definitions of ancient woodland, only 25% and 21% of owners felt very confident in identifying ancient woodland and PAWS respectively, and 44% and 41% respectively of agents. These are surprisingly low figures, particularly for agents, and suggest an important training need; this could potentially be addressed in conjunction with the Royal Institute of Chartered Surveyors (RICS)/Institute of Chartered Foresters (ICF).

Economics. The overall economics of ancient woodland restoration can be challenging. In Wales, high costs associated with restoring PAWS with poor access or steep slopes can be a barrier, even with higher timber prices. This can be compounded if no grant aid is available. The same issues can affect the management of poorer quality ASNW. In Scotland, however, restoration can be carried out at a profit as it involves timber production by default. In any case, there appears to be a lack of up-to-date data on the costings and economics of ancient woodland restoration and costed case studies³⁷. Re-running the 2002 Pryor and Jackson study on the cost of restory PAWS³⁸, collating evidence on the value of broadleaves, or developing up-to-date costed case studies could be helpful in persuading some owners/agents to carry out restoration work.

Environmental. A range of environmental issues can arise with ancient woodland restoration. These include:

- Pests and diseases. The presence of pests and diseases can affect the practicalities and cost of restoration.
 - Rhododendron affects 3.3% of woodland in Great Britain. It is particularly prevalent in South East England, Wales and West Scotland and a higher proportion of private land is affected compared to public land³⁹. Rhododendron is very costly to clear. Other invasive plant species which can affect restoration and may require control include bracken and bramble; this is linked to the spread of *Phytophthora* (see below).
 - *Phytophthora ramorum* which affects larch, necessitating clear-felling, can be a threat to the gradual restoration of PAWS, both in terms of the speed of removal and the species used to restock cleared areas.
 - *Chalara fraxinea* or ash dieback is increasingly prevalent in England. Where present, the recommended response is to increase species diversity both within ASNWs and when restoring PAWS. Unfortunately the disease has removed a valuable replacement species for conifers on a number of PAWS.
 - Deer are a key reason for the unfavourable condition of woodland SSSIs and other ancient woodland in Scotland and elsewhere. Deer culling and deer fencing can be required to control excessive deer browsing, adding to the cost of restoration.
 - Grey squirrel eat saplings and young trees, both planted and naturally regenerating. This damage can have a significant impact on the restoration of ancient woodland, especially on PAWS, and for landowners affects the viability of growing quality hardwood. Control in the form of shooting, trapping or biological control can be required to enable establishment⁴⁰.

There may be a facilitation role for the Trust in addressing these challenges which have wider benefits at a landscape scale, given that no one organisation is taking overall responsibility to drive solutions actively.

- Climate change is expected to bring new pests and diseases to ancient woodland. Small, isolated patches of ancient woodland are particularly vulnerable to climate change as many species typical of ancient woodland are slow to colonise new areas and only move slowly across the landscape. Enlarging and buffering ancient woods is therefore often a more immediate priority than attempting to create large-scale networks and corridors (England Biodiversity Strategy).

Practicalities and approach. Other limitations associated with ancient woodland restoration such as lack of time, lack of infrastructure for extraction, poor weather etc. can dissuade or impede woodland owners from progressing restoration. In terms of optimal approach, there is strong and growing evidence that a gradual approach to PAWS restoration is best²¹, however it is acknowledged that there

is no 'one size fits all' solution and external circumstances can demand more rapid restocking. The PAWS conference in Wales³⁴ provided feedback on whether a gradual approach is a barrier to restoration: 'yes' reported 33% of participants; 'sometimes depending on the site and situation' reported 50%; and 'no' reported 17%. Other suggestions regarding approach include more active promotion of Continuous Cover Forestry and addressing the logistics of harvesting small inaccessible parcels (such as top-up support, machinery rings etc.).

Data. Ancient woodland data appears to be limited, variable in quality, and not easily accessible. This stems from the fact that the AWI is inaccurate and incomplete, and is compounded by a lack of aggregated data and reporting on the extent of ancient woodland. The GIS datasets which show the location of individual ancient woodland parcels are useful, but could be improved with information on key features and condition. Better data would encourage more restoration.

Development. Demand for land for residential and commercial development, and for infrastructure projects is affecting ancient woodland in terms of land-take and disturbance. Planning policy is clear in terms of protecting ancient woodland unless the need for, and benefits of, the development clearly outweigh the loss. However there is a lack of awareness of ancient woodland, in particular PAWS, amongst planners. In a survey of planners conducted by the Trust in 2016, 96% of respondents were aware of the term 'Ancient Woodland' but disappointingly only 27% were aware of what a 'Planted Ancient Woodland' is. There is a big difference across areas of the UK in terms of planner awareness and knowledge. South and South East England are most in favour of considering ancient woodland and PAWS in planning, however planted ancient woodland is still not felt to be a high priority. 64% of respondents stated that they are unaware of the AWI and 75% were unaware of the Ancient Tree Inventory (ATI). House builders surveyed were mostly unaware of both the AWI and ATI. Only 50% of respondents agreed that the Natural England (NE)/Forestry Commission Standing Advice for Ancient Woodland and Veteran Trees met their requirements. Importantly, high numbers of respondents thought that there are different types of development which outweigh the loss of ancient woodland.

Protection. A certain amount of protection for ancient woodlands is provided through the felling licence and EIA regime however this is not specific to ancient woodlands. There is no statutory legal protection of ancient woodlands per se and only 21% of ASNWs are designated/protected as SSSIs/ASSIs or SACs. This would appear to be a weakness in the current system. Options for improving protection include pushing for specific statutory designation and legal protection (as has been argued for by the Scottish Wildlife Trust³¹) or potentially the Trust developing its own model (e.g. for protecting important clusters of PAWS). Specific conditions could also be sought within the felling licence

and EIA regime, for example to avoid the 'eating away' of woodlands by developers. In any case, there would need to be clarity on definitions and any new system would need to be simple to manage and not overly burdensome on landowners.

Partnerships. Entering into partnerships can open doors to more and better ancient woodland restoration. The AWR project has involved partnerships in two ways²⁴: the co-location of project officers within partner organisations such as the FC, South Yorkshire Community Forest Partnership and Northern Ireland Environment Agency; and project delivery via third party agreements and project officers in the direct employment of contracted organisations including Exmoor National Park Authority (ENPA) and Rural Development Initiatives Associates (RDIA) in Scotland. Partners have brought different areas of expertise to the project; for example, RDIA has significant commercial forestry expertise and networks that the project officers have been able to tap into and the linkage has reinforced the credibility of the project with the sector in Scotland. Partners can also provide referrals and access to their networks within the sector; for example ENPA has facilitated access to existing woodland owner and agent networks. Partnerships with those agencies charged with managing the public forest estate (FC, NRW and FS(NI)) would also be beneficial in terms of progressing restoration goals.

Partnerships are vital to the success of restoration work, but they need to have SMART objectives, have effective agreements in place, offer transparency and not be used to fill funding gaps of partner bodies. There is a need for the Trust's partnership teams to be more centrally involved in development work.

With regard to working with the PFE, there are different experiences and a need to share good practice. For example, while forest plans are long term and compliant, there can be divergence from the plans on the ground; with even less control when PFE areas are leased out.

Gaps in evidence

This review has identified a number of gaps in evidence which would be useful to fill in order to support the restoration of ancient woodlands. These are outlined in Table 6-1 below.

Table 6 1: Gaps in evidence

- The AWI is not complete or comprehensive, and there appear to be inconsistencies across the UK. The result is no accurate data on the extent of ASNW and PAWS. It would be beneficial to bring the AWI up to date, to the same standard, in all four countries.
- Aggregated data on the extent of ancient woodland, by country and type, drawing on the AWI, has not been updated by the Forestry Commission since 2012. Ideally, this would be produced annually or at least around every five years.
- There is a lack of comprehensive data on the condition and quality of ASNW and PAWS; the exception is the NWSS in Scotland.
- While GIS data is available on the location and extent of ancient woodland drawing on the AWI, there appears to be no readily available information on the key features and condition of individual ancient woodlands to guide woodland owners and managers.
- There are no up-to-date, aggregated statistics setting out the condition of woodland SSSIs/ASSIs and SACs across the UK. While it is assumed that the majority, if not all, designated woodland sites are ancient woodlands, there is no evidence to support this and/or the split between ASNW and PAWS.
- There is no aggregated data on the amount of PAWS restoration being undertaken across the UK. It would be helpful to have this broken down by country and on public (PFE) and private land.
- There is no aggregated data on the uptake and impacts of forestry grant scheme options supporting PAWS restoration.
- There is a lack of detail on appropriate prioritisation criteria for PAWS restoration. How do we know – with incomplete quantity and quality data – that effort and resources are being directed to the right places?
- There are no quantified targets for the enhancement of ASNWs and restoration of PAWS across the UK, broken down by country.
- While there is evidence to support a gradual approach to restoration, there is a need for further exploration/research relating to the effects of different silvicultural techniques. There is a lack of evidence on the benefits and value of different types of ancient woodland. This could link into a natural capital/ ecosystem services assessment and valuation and could strengthen the case for better protection and support.
- There is no up-to-date economic data setting out the income and expenditure associated with ancient woodland restoration, and how this varies by type or circumstance. Detailed worked examples or case studies would be beneficial.
- There is little evidence on intermediaries' attitudes and how a positive partnership could be developed to support restoration across a wider area.
- There is no data on the ecological and economic impacts of the AWR project. It would be good to be clearer about what the ecological impacts are in particular, and the implications for the confidence/certainty levels about what management/approach is most effective.
- There is a lack of synthesised evidence and learning from previous and existing non-HLF projects.
- There is a lack of information on the barriers affecting managers of the PFE and other public bodies in terms of PAWS restoration and how these could be overcome.
- There is a need to make sure that the effectiveness of different measures is tracked by type/size of landownership.

Conclusions and recommendations

Conclusions

There are around 585,000ha of ancient woodland identified in the UK, including 358,000ha of ASNW and 227,000ha of PAWS. These ancient woodlands are unique and provide a wide range of environmental and cultural benefits.

There is an urgency now to PAWS restoration. Ancient woodland features are deteriorating or being lost and conifer crops on PAWS are maturing and coming to the end of their rotation. There is need to safeguard remaining wildlife and historic features and restore these areas to rich Ancient Semi-Natural Woodlands before they are restocked with conifers or inappropriate broadleaf species. It is acknowledged however that while it is urgent, PAWS restoration also takes time to implement and requires sustained commitment and effort.

The Woodland Trust has been involved with ancient woodland restoration since its establishment in the 1970s, and in recent years has raised its game in terms of the extent of restoration undertaken. It is estimated that the Trust has restored or started restoring 3,770ha of PAWS on its own estate and has helped private woodland owners to commit to restoration a further 22,586ha in recent years. This makes a total of 26,356ha which is being restored or is committed to restoration as a result of the Trust's activities, equivalent to 11% of PAWS land across the UK.

Looking ahead, the majority of ancient woodland restoration will take place on private land and on the PFE. The Trust has a key role to play in terms of leading, encouraging, influencing and possibly delivering this. It will be supported by the work which the Trust undertakes on its own estate including research, best practice and demonstration.

The Trust is on a learning curve, in terms of engaging with landowners and intermediaries. With the right support, the Trust can develop and improve this work, thereby increasing the quantity and quality of ancient woodland restoration being undertaken on private land. Questions going forward include: what happens at the end of the HLF project in 2018; on what and where should the Trust focus its effort in terms of landowner engagement; and to what extent should it partner with and influence partner organisations to do this work. In other words, what is the Trust's USP (unique selling point)?

Developing partnerships with other organisations has proved effective and it would be worthwhile extending this approach across both privately and publicly owned woodland.

The external context for ancient woodland restoration is challenging on a number of fronts, including: relatively weak policies and protection; lack of quantitative targets; inadequate grants; lack of data; and a range of environmental and other pressures on site. Presently there is a small 'carrot' - with an uncertain future (post-Brexit) - and only a small 'stick' providing the impetus for ancient woodland restoration.

Recommendations

A number of recommendations are made for the consideration of the Trust:

- **Strategy.** An overarching strategy for the protection and restoration of ancient woodland would be beneficial, and should be a core part of the Trust's overall approach and programme. This strategy would raise awareness of, and campaign to improve weak areas as set out in the following points
- **Ancient Woodland Inventory.** The AWI should ideally be updated across the UK to provide a robust, consistent baseline. However, an AWI update could be demanding in terms of resources and a prerequisite would be clarification of definitions of ancient woodland. A pragmatic, short-term approach could be to accept and acknowledge existing weaknesses and focus effort on the most important woodlands, for example those of ecological importance.
- **Ancient woodland condition.** Information on key features and the condition of individual woodlands should ideally be provided alongside information on location and area as set out in digital maps (such as that available for designated wildlife sites). This data would help inform and guide woodland owners and managers, although it is recognised that it would take time to achieve.
- **Policies and targets.** Forestry and biodiversity policies should be strengthened, with specific commitments and quantified targets for ancient woodland restoration across the UK, on both public and private land, to agreed timescales. It is acknowledged that some countries are better than others in respect of policies and targets; for example, Scotland has reasonably strong policies and some targets.
- **Protection.** Additional protection for ancient woodland should be provided. Options include promoting a specific legal designation for ancient woodland and developing felling licence conditions favourable to conservation and restoration. It is acknowledged that definitions would need to be clarified and the case for additional protection would need to be supported by clear evidence of significant loss and damage under the current system.
- **Planners' awareness.** Planners' awareness of ancient woodlands, including PAWS, should be raised in order to help protect them from adverse planning decisions.
- **Grants and funding.** The uptake and performance of the current grant schemes/options should be kept under review and improvements sought where necessary. Current shortcomings such as limits on options/budgets for restocking PAWS in England, Wales and Scotland need to be addressed. As grants decrease, alternative funding mechanisms need to be explored and developed, for example, externally funded projects, Payments for Ecosystem Services (PES) schemes and crowd or community funding.

- **Engagement with owners and intermediaries.** This effort needs to continue and be extended, particularly to agents/ advisers, managers and others in the forestry supply chain. The support and resources provided should be kept under review and adapted as required; this might include more training and information and, for small woodland owners, further support during implementation. Other bodies which deal with the majority of woodland owners on a day-to-day basis should be encouraged to do their bit and be supported by the Trust (e.g. with resources, demonstration, training etc.) thereby increasing the Trust's reach.
- **Partnerships.** Existing partnerships should be continued and new partnerships developed to promote PAWS restoration on both private and public land. Promoting and encouraging PAWS restoration on the PFE, and holding the Forestry Commission (FC)/Forest Service Northern Ireland (FS(NI)) to account, presents a particularly important opportunity given the scale of the resource.
- **Demonstration.** Good practice should be demonstrated both on and off the Trust's estate through a network of sites across the UK. The Trust should ensure that its whole estate is an exemplar of best practice.
- **Approaches.** Alternative silvicultural systems that involve natural regeneration should be considered. The adoption of CCF based systems is likely to be more conducive to AWR than previous regimes.
- **Evidence.** The gaps in evidence relating to ancient woodlands and ancient woodland restoration need to be filled in order to inform and guide future work. This would benefit from co-ordination of research and analysis with forestry bodies and countryside agencies amongst others. This could include long-term scientific monitoring (e.g. soils), repeat surveys of owners and agents, and using volunteers to gather anecdotal evidence to support the Trust's work (e.g. case studies).
- **Monitoring.** Data on the extent of ASNW and PAWS, the amount of ancient woodland being restored, and the proportion in favourable condition should be maintained and reported on at least every five years.

Glossary	
ASNW	Ancient Semi-Natural Woodland
ASSI	Area of Special Scientific Interest
ATI	Ancient Tree Inventory
AWI	Ancient Woodland Inventory
AWR	Ancient Woodland Restoration
BAP	Biodiversity Action Plan
BWW	Better Woodlands for Wales
CCF	Continuous Cover Forestry
DARD	Department of Agriculture and Rural Development
DEFRA	Department for Environment, Food and Rural Affairs
DOENI	Department of the Environment for Northern Ireland
EIA	Environmental Impact Assessment
ENPA	Exmoor National Park Authority
EU	European Union
FC	Forestry Commission
FCE	Forestry Commission England
FCS	Forestry Commission Scotland
FS(NI)	Forestry Service Northern Ireland

Glossary continues on next page

HLF	Heritage Lottery Fund
HoP	Houses of Parliament
ICF	Institute of Chartered Foresters
JNCC	Joint Nature Conservation Committee
LEPO	Long Established Woodland of Plantation Origin
LWS	Local Wildlife Site
NE	Natural England
NFI	National Forest Inventory
NIEA	Northern Ireland Environment Agency
NNR	National Nature Reserve
NRW	Natural Resources Wales
NWSS	Native Woodland Survey of Scotland
OS	Ordnance Survey
PAWS	Plantations on Ancient Woodland Site
PES	Payment for Ecosystem Services
PFE	Public Forest Estate
RDIA	Rural Development Initiative Associates
RICS	Royal Institute of Chartered Surveyors
SAC	Special Area of Conservation

SG	Scottish Government
SNCI	Site of Nature Conservation Interest
SNH	Scottish Natural Heritage
SSSI	Site of Special Scientific Interest
UKFS	UK Forest Standard
UKWAS	UK Woodland Assurance Standard
WAG	Welsh Assembly Government
WT	Woodland Trust

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