

## 4. Principles for Tree and Woodland Establishment and Management

The below principles should be taken into account when planting trees, creating new woodland and managing existing woodland; it is also strongly recommended that expert advice is sought when doing so. They are intended to provide high-level guidance to organisations, rather than aiming to micro-manage tree planting and woodland creation in the region, and ultimately seek to maximise the benefits that woodlands and trees can provide to wildlife and people.

These principles have been produced to align with and complement existing [regulations](#) including the Forestry Act 1967, Environmental Impact Assessments and Habitats Regulations, as well as existing guidance and best practice, such as the [UK Forestry Standard](#) or guidance produced by industry leaders.

**The principles are organised under five ecosystem services and ways to manage woodlands to facilitate delivery across all ecosystem services:**

- 1. Ecological Networks:** the contribution of trees and woodlands to the region's ecological network and the benefits they provide to wildlife.
- 2. Climate Change:** the role that woodland and trees play in climate change mitigation (sequestering carbon) and adaptation (increasing resilience to increased flooding, heat and other impacts of a changing climate).
- 3. Natural Flood Management:** the contribution that strategically located trees and woodlands could make to flood management.
- 4. Health, Wellbeing and Culture:** the benefits that woodlands and trees can provide to people's health and wellbeing, and their cultural value.
- 5. Sustainable Woodland Economy:** the role of a sustainable woodland economy, and the economic value that can be created through production of timber and other products.
- 6. Managing Woodlands for Ecosystem Services:** The use of management techniques to maximise the value of woodlands across all ecosystem services, including tackling pests, disease and invasive species.

Additionally, relevant resources for advice on woodland management, tree planting and dealing with ash dieback are listed at the end of this Section.

### 4.1 Nature's Recovery

- The creation of new woodlands should, where possible, be close to and join existing woodlands, so as to assist in the creation of a coherent ecological network in the West of England. The **Tree and Woodland Priorities by Landscape Character Area** included in this document, which reflect the **West of England Nature Recovery Network** and other evidence, should be used to guide tree planting and woodland creation.
- Woodland should not be planted on existing ecologically valuable grassland, which is an important and vulnerable habitat. Additionally, areas identified as being within the strategic grassland network for the West of England should be prioritised for grassland creation and conservation.
- A range of wooded habitats, including woodland, hedgerows, riparian corridors, open wood pasture and urban trees, will strengthen the ecological network.
- The possibility of creating mosaic habitats (an area or site comprised of multiple habitat types) when creating woodland should be considered. In areas that are within two or more of the woodland, grassland and wetland strategic networks of the West of England West of England Nature Recovery Network, mosaic habitats should be prioritised.
- The use of grazing animals to create a more dynamic ecology and habitat succession can provide significant benefits to wildlife and will be key in achieving nature's recovery (this is sometimes termed 'rewilding' but can also refer to [wood pasture](#)). If this approach is chosen, the mix and number of grazing animals used must be carefully selected considering the characteristics of the site, and experts should be consulted. [Rewilding Britain](#) are developing a '[Rewilding Network](#)'

to provide resources to support such approaches.

- Natural colonisation (otherwise known as natural regeneration) should be considered as an (often cheaper) alternative to tree planting, as it can result in the establishment of trees better adapted to local conditions and provide a composition of trees more suited to native wildlife. Natural colonisation can be especially effective next to existing ancient or semi-natural woodland as a means of expanding the most valuable woodland habitats.
  - Any woodland planted should be an appropriate mix of species for the site and reflect the management objectives in question. Native species should be planted where possible, especially when nature's recovery is the priority, although the use of more southerly seed sources<sup>50</sup> may be appropriate as part of adaptation to a changing climate<sup>51</sup>. For larger sites, the Forest of Avon Trust, Woodland Trust, the Forestry Commission, Forest Research, Forest of Avon Trust, local ecologists and/or professional forestry agents should be consulted on the appropriate mix of species; for smaller sites, advice available online (see Section 4.7.2) may suffice.
  - Woodlands, once established, should be managed to deliver objectives including maximising benefits to wildlife, and especially of specialist woodland species that are threatened (see Section 4.6).
  - The planting of hedgerows, including but not limited to farmland, should be used to connect existing hedgerows and woodland where woodland creation is not possible. Hedgerows or wider shrub belts, if planted, should be of a suitable mix of native species<sup>52</sup> and maintained in a way<sup>53</sup> that maximises benefits to wildlife.
- Hedgerows should also include irregularly spaced trees, which can be promoted through design codes.
- Riparian habitat (habitat on and alongside the banks of rivers) can act as natural ecological corridors through which wildlife can travel, as well as enhancing in-river ecology, providing natural flood management and improving water quality. Trees and woodland are a vital component of riparian (i.e. riverbank) habitat. BART's [approach to tree planting](#) should be referred to inform riparian habitat creation and management.
  - As well as better managing our existing woodlands for wildlife, we need to protect our trees and woods from being lost to development and other pressures. Ancient woodlands, and ancient and veteran trees are afforded protection against development because of their irreplaceable nature (per NPPF para 175c); planning decisions must enforce this. Beyond ancient wooded habitats, no woodland should be lost, except where there is an environmental gain to a changed land use (e.g. removing trees on peatland or wetland) and, in this case, the EIA process must be followed and voluntary replacement planting should be carried out as good practice. Tree planting should not be used as compensation for the loss of woodland; compensatory measures can take decades to become established, representing lost years of crucial carbon storage and wider environmental benefit.
  - Individual and groups of trees in rural or urban areas contribute much to ecological networks as well as landscape quality, cultural identity, and health and wellbeing. As capacity allows, advice should be provided and good

50 When introducing more southerly species, measures should be taken to avoid introducing pests and diseases – see Section 4.6.4.

51 <https://www.forestresearch.gov.uk/research/genetic-considerations-provenance-choice-native-trees-under-climate-change-england/>

52 The ideal mix may depend on the location where the hedgerow is planted, but see the following link for a suggested 'traditional' mix: <https://www.suffolkwildlifetrust.org/conservationadvice/woodlands-and-hedgerows/planting-hedgerow-wildlife>

53 See e.g. [http://ww2.rspb.org.uk/images/englishhedgerows1\\_tcm9-133255.pdf](http://ww2.rspb.org.uk/images/englishhedgerows1_tcm9-133255.pdf)

practice promoted to landowners to safeguard, care for and, when appropriate, replace these trees. Accepting that urban trees are part of a dynamic system, community groups can have an important role in championing individual trees and building support for new ones.

## 4.2 Climate Change

- Planting trees and creating woodland, including allowing woodland to regenerate naturally, are recognised as an effective means of sequestering carbon and building resilience to the impacts of climate change in response to the Climate Emergency that has been declared by all four local authorities in the West of England, the West of England Combined Authority, and other organisations and businesses in the region.
- Retaining, restoring and enhancing existing woodlands should be used as an effective way of storing carbon. Protecting existing woodland, especially ancient woodland, is important for maintaining stored carbon, and well-managed, healthy woodlands store more carbon than poorly managed ones<sup>54</sup>.
- Much of the carbon sequestered by woodland trees is stored in the soil<sup>55</sup>; therefore, avoiding soil disturbance is important in maximising carbon sequestration. Continuous cover management regimes avoid the release of carbon back into the atmosphere through planned thinning and reduced disturbance of soil<sup>56</sup>.
- Although it is recognised that coniferous species can sequester carbon more quickly than native broadleaved species, maximising the carbon storage potential of woodland should not prejudice nature's recovery, especially in ecologically sensitive areas and within the Nature Recovery Network. The principle of the right tree in the right place should be followed, which is key to providing more and better-connected habitat for wildlife (see above), and for a healthy, functioning natural environment.
- Native or naturalised broadleaved species that are good for carbon sequestration in the West of England include aspen, beech, wild cherry, and sycamore, although the impacts of climate change on the future viability of these species (especially Beech and Sycamore) needs to be considered.
- Productive woodlands, including the provision of wood fuel, the use of timber in construction, and the use of trees to create other products (such as those that can be made through coppicing) should be considered as ways of decarbonising parts of the economy – see 'Sustainable Woodland Economy'.
- Genetic diversity (evolved through natural regeneration), as well as species diversity, is understood to be important in ensuring the resilience of woodlands to a changing climate.
- Trees and well-connected woodland should be used to build resilience to climate change and to adapt to a changing climate through, for example, providing shade and cooling effect in urban areas, managing flood risk, and enabling woodland species to travel through the landscape.
- An additional focus for woodland creation might be where current land use could become unviable due to a changing climate.



54 See <https://www.forestresearch.gov.uk/research/understanding-the-carbon-and-greenhouse-gas-balance-of-forests-in-britain/>

55 According to Forest Research, carbon in forest soils accounts for almost 75% of total forest carbon stock.

56 However, it should be noted that it can take a complete rotation to convert forests managed under a clear fell system to a continuous cover system.

### 4.3 Natural Flood Management

- The potential for woodland to provide natural flood management<sup>57</sup> should be considered when identifying locations for tree planting and woodland creation, especially in upland areas and in appropriate parts of the floodplain<sup>58</sup>. The WENP Ecosystem Service Opportunity Map: Water Quantity (available at <http://www.wenp.org.uk/maps/>) shows areas where the opportunities are greatest to modify the land so it can absorb and store water more effectively, and should be used to inform the use of woodland for natural flood management.
- '[Working with Natural Processes](#)' identifies areas of potential for additional floodplain woodland, riparian woodland and catchment woodland within England and Wales. As indicated in the Working with Natural Processes Evidence Directory, using the correct combination of measures in the right place can help to slow flood peaks and also achieve other benefits at the same time, including: improving water quality; reducing soil erosion and sedimentation of lakes and rivers; increasing carbon capture and storage; and creating new habitat to restore biological diversity.
- Additionally, expert advice (from, e.g. the Woodland Trust, the Forestry Commission, the Bristol Avon Catchment Partnership, Bristol Avon Rivers Trust, or the Environment Agency) should be sought to identify the optimal location and planting/regeneration scheme to provide maximum benefits to flood management.

### 4.4 Health, Wellbeing and Culture

- The location of new woodland and tree planting should be chosen considering the potential benefits that woodlands and trees provide to people's health and wellbeing, and to promote equitable access to woodland to all populations, irrespective of socio-economic status.<sup>59</sup>
- Landscape character and important views should be considered carefully when establishing new trees and woodlands, with certain areas recognised as being unsuitable for large-scale woodland creation. This is especially relevant in the Cotswolds AONB, the Mendip Hills AONB, Bath World Heritage Site and its environs, and surrounding scheduled monuments such as hill forts. The Tree and Woodland Priorities by Landscape Character Area account for this, but more detailed guidance as contained in Landscape Character Assessments and AONB Management Plans should also be consulted where appropriate.
- The planting of trees and woodland in urban areas, including in parks and streets, is recognised as especially important to people's health and wellbeing. Suitably chosen urban trees can contribute much to people's physical wellbeing through providing a cooling effect, providing shade and reducing air pollution. The presence of and engagement with trees close to where people live also provide important mental health benefits.
- It is recognised that areas with low canopy cover and deprived areas will benefit most from tree planting, which can help address issues of inequity. Therefore, canopy cover and the Index of Multiple Deprivation should be used to prioritise tree planting, especially in

<sup>57</sup> Carefully planned tree planting will slow water run-off (and limit downstream flooding), reduce land erosion, help to moderate stream temperature and aid flood risk management. See: <https://www.gov.uk/government/news/reduce-flood-risk-with-the-woodlands-for-water-scheme>.

<sup>58</sup> See [https://www.forestryresearch.gov.uk/documents/1756/woodland\\_flood\\_control\\_iale\\_paper\\_2006.pdf](https://www.forestryresearch.gov.uk/documents/1756/woodland_flood_control_iale_paper_2006.pdf)

<sup>59</sup> See e.g. <https://www.forestryengland.uk/wellbeing#research>

urban areas,<sup>60</sup> providing shade and reducing air pollution.

- The Woodland Trust's Woodland Access Standard should also be applied, which aspires that: no person should live more than 500m from at least one area of accessible woodland of at least 2ha in size; and there should also be at least one area of accessible woodland of at least 20ha within km of people's homes<sup>61</sup>.
- The involvement of local communities in tree planting, maintenance and management can provide additional benefits to people's physical and mental wellbeing, and broaden the constituency of support and action for trees and nature.
- Public rights of way as well as other paths should be accommodated and enhanced within the design of new woodland, and new routes created to extend and improve local access networks, whilst reflecting wildlife, management and/or safety considerations. New public access should not be provided in SSSIs, Ancient Monuments and other sensitive sites without the approval of the statutory regulatory body.

#### 4.5 Sustainable Woodland Economy

- Management techniques that provide an income source while providing other benefits for people and wildlife should be considered as a way of enabling sustainable management of woodland. This could include, but is not limited to, timber production, coppicing, agroforestry including wood pasture, wood fuel production, the use of grazing animals for food, recreation, wellbeing activities and forest schools.
- The effect of any potential management technique used to provide an income source on wildlife and people must be considered

– not all woodlands will be suitable for all management techniques, as outlined in Section 4.6.

- There is significant demand for timber; currently, the UK imports the vast majority of its timber. However, due to the impact of grey squirrel populations among other factors (see section 4.6.6), it is difficult to grow broadleaved species for timber; coniferous forests therefore currently provide the most viable method of timber production. However, productive woodland managed for timber can be managed sympathetically to biodiversity and other ecosystem services. Continuous cover management regimes, which attempt to mimic natural processes, are effective for production and biodiversity aims, and areas of native woodland managed for biodiversity objectives should be integrated into productive woodlands. The [UK Forestry Standard](#) is a good source of guidance.
- [Coppicing](#) should be considered as a management technique that can produce woodland products, provide an income source and benefit wildlife (including many threatened species).
- Woodlands can provide opportunities for active recreation, which can make them accessible to a broader range of people, provide employment and bring in income to enable woodland management (and establishment). As well as walking trails, recreational activities that may be suitable for parts of new woodland include mountain biking and adventure sports such as ziplining or obstacle courses. The impact of these activities on woodland ecology should be minimised and fully addressed in site management plans if they are pursued.
- Large scale woodland creation should generally be avoided on high-quality agricultural land, and especially on Grade

60 The Forestry Commission has identified priority areas for woodland creation based on data that includes populations, deprivation indices and existing public access provision. See <https://data.gov.uk/dataset/c5aa9ae9-4aa0-4059-a256-421a7958ab1d/priority-places-for-england-2016>

61 <https://www.woodlandtrust.org.uk/media/1721/space-for-people-woodland-access.pdf>

l agricultural land, which can be used for sustainable food production. On these sites, better management and expansion of hedgerows, field corners and in-field trees still provide excellent opportunities for improving soils, ecological connectivity, water management and carbon storage.

- [Agroforestry](#) may be a suitable management technique to combine food production with tree planting in areas of high agricultural productivity and is relevant to both arable (silvoarable) and grazing (silvopasture) systems. The [Agroforestry Handbook](#) provides useful, practical guidance on this approach.
- Orchards have been traditionally important in the West of England. Well-managed, they can provide a source of sustainable food while benefiting wildlife and sequestering carbon.<sup>62</sup> Existing traditional orchards should be conserved, and new ones created where possible.
- Grant schemes should be considered as a means of financing tree planting or natural regeneration. Additionally, there is potential for funding for habitat creation through Biodiversity Net Gain and agricultural subsidies under revised agricultural policy. Appendix I to this document provides further detail on potential funding sources for woodland creation and management.

### 4.6 Managing Woodlands for Ecosystem Services

#### Sustainable Woodland Management

- Management techniques should be mindful of the site in question and especially of neighbouring habitats. It is usually advisable to try to extend existing habitats through suitable management and creation.
- Continuous cover management regimes, as well as providing important water attenuation and biodiversity benefits, are key in maintaining species and age diversity, and avoid the release of carbon back into the atmosphere through planned thinning and reduced disturbance of soil.
- To enable effective natural regeneration/colonisation, a diverse woodland, a prevailing wind, and suitable soil will be required. Additionally, prevention of overgrazing from deer will usually be necessary and other management interventions may be required over time to ensure species diversity.
- If tree guards are used when planting trees, they should be removed when they split and before they start to disintegrate. Used tree guards should be removed from the site to protect local wildlife and disposed of responsibly (ideally by recycling).
- Weeding around a tree may be necessary to ensure the survival of planted trees. If doing so, 'natural' methods for suppressing weeds (e.g. using mulch, such as bark chips or straw bales) should be used in preference to the application of chemical-based products, which can be detrimental to wildlife.

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<sup>62</sup> Creation of traditional orchards is also [eligible for funding](#) under the Countryside Stewardship Scheme.

## Ash dieback

- Trees affected by ash dieback should be felled only when there is a material safety risk, a clear future safety risk (e.g. for roadside trees or high-use areas), or as part of normal silvicultural operations. Organisations will have their own definition of what presents a material safety risk, but the [Woodland Trust's zoning approach](#) or the [Quantified Tree Risk Assessment](#) are recommended. Otherwise, and where financially viable, trees affected by ash dieback (including dead trees) should not be felled to enable resistance to ash dieback to develop among the species, and so that dead wood can provide value to wildlife.
- Trees felled through ash dieback should be replaced using a suitable mix of native broadleaved trees in order to ensure no net loss (to wildlife and people); again, expert advice on an ideal replacement mix should be sought. Each ash tree lost should be replaced with at least three new trees for a large ash tree, two for a medium tree, and one for a small tree. More detailed advice on replacing lost ash trees is available at [this link](#), and further information on dealing with the disease is provided by the [Tree Council's Ash Dieback Toolkit](#). More resources for dealing with ash dieback are provided in Section 4.7.2.
- In woodlands with high levels of natural regeneration of species other than ash, it may be appropriate to replace ash with natural regeneration if there are interventions to selectively clear competitive vegetation, control pests and/or manage any public access.
- Everyone involved in the felling of trees – whether it is an owner felling trees themselves or employing others to do the work, such as an agent, timber merchant or contractor – must ensure that a felling licence or other permission has been issued before any felling is carried out. See [Tree Felling – getting permission](#).
- When felling ash trees, organisations should engage with the public to ensure

understanding of why felling is taking place and to discuss the risks of tree disease more widely.

## Other Pests and Diseases.

- Ash dieback is not the only threat to our trees. Other diseases with significant potential impacts on trees in the West of England currently include Sweet Chestnut Blight, Phytophthora, Oak Processionary Moth and Acute Oak Decline. There are many further diseases, generally with less impact at the West of England level, of which woodland managers should be aware.
- Due diligence in biosecurity practices – not just in sourcing trees (as in the next section) but also in woodland management – should be practiced to best manage tree disease.
- Sightings of tree diseases should be reported to TreeAlert – the Forestry Commission's online tool where sightings of dangerous tree pests and diseases should be reported – to best support the national response.
- Observatree is a tree health citizen science project which trains volunteers to spot pests and diseases, thereby helping tree health authorities identify and manage outbreaks early.
- Oak Processionary Moth (*Thaumetopoea processionea*) is a threat to human health as well as oak trees. This non-native moth, accidentally introduced in 2005, strips oaks trees of their leaves, leaving them vulnerable, but also poses a health risk to humans by causing rashes and breathing difficulties.
  - The public must be made aware not to touch or approach oak processionary moth caterpillars or their nests.
  - There are currently special restrictions on the movement of oak plants to minimise the risk of introducing OPM to new areas.
  - Any sightings should be immediately registered to TreeAlert.

### Preventing establishment of disease, pests and invasive species

- Woodlands are far more resilient to pests and diseases if the principle of diversity of species, age and structure is followed. Therefore, getting good advice and managing woodland to avoid “putting all your eggs in one basket” is important. Effective and sustainable woodland management (see 4.6.1 above) to create this diversity is critical.
- Natural regeneration is recognised as being important in building resilience and genetic resistance to disease in native tree species.
- In order to prevent future tree diseases, trees to be planted should be sourced from tree nurseries that produce trees sourced and grown in the UK/Ireland<sup>63</sup> where possible<sup>64</sup>. If trees are imported from elsewhere, they should be from nurseries that use biosecurity measures that aim to reduce the risk of diseases being imported (such as quarantining trees for a season before planting).
- Organisations should take appropriate biosecurity measures when planting trees and managing woodland to minimise the risk of existing invasive species (such as rhododendron) establishing themselves in existing and new woodland. Additionally, already-established invasive species (including rhododendron) should be removed from woodland where possible.

### Deer management

- Overgrazing by deer can be a problem in existing and new woodlands, leading to tree damage and reduction in ground flora. Deer populations should be managed where evidence suggests it is necessary and feasible to promote positive conservation outcomes. This can include fencing or individual tree protection, and/or humane culling of deer to

a specific density where monitoring suggests this is necessary.

- Co-operation should be undertaken with neighbours and local deer management groups; if no such groups exist and where there is a need, a local group could be set up. Participation in wider, collaborative management schemes at landscape scale is a more effective means of managing deer.
- Only non-toxic ammunition should be used to reduce the amount of lead entering the environment and potentially the human food chain.

### Grey Squirrel management

- Grey squirrels damage forests and woodlands by stripping bark from trees' main trunks and branches, mainly targeting young trees, which can lead to the death of trees. This damage is detrimental to woodland ecosystems and also disincentivises the planting of broadleaved species for timber purposes. Certain species are more vulnerable to damage than others.
- Approved trapping or shooting methods can be used to humanely manage grey squirrel numbers where feasible. The use of Pine Martens to control grey squirrel populations is being trialled in some areas. More information on the management of grey squirrels can be found on the [Forest Research website](#) and the [Squirrel Accord website](#).
- Grey squirrel control programmes will be most effective across multiple ownerships and at landscape scale, and where they are appropriately managed to avoid perturbation effects (whereby management of grey squirrels increases the damage caused by grey squirrels in neighbouring woodlands).

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63 UKISG (UK & Ireland Sourced and Grown) promotes tree nurseries that produce trees sourced and grown in the UK and Ireland.

64 Recognising that the importing of southern species to adapt to a changing climate may be appropriate in some cases.

## 4.7 Further Resources

### Woodland Management

For advice on long-term woodland management, the following organisations and sources can provide more information:

- Sylva Foundation's [my Forest service](#)
- [The Small Woodland Owner's Group](#)
- The Forestry Commission booklet '[So, you own a woodland?](#)'
- [Forest Research](#)
- [The Small Woods Association](#)
- [Sustainability Centre](#)
- [Royal Forestry Society](#)
- [Institute of Chartered Foresters](#)

### Ash Dieback

FC Guidance		
<a href="#">Managing Ash Dieback in England</a> (scroll down to "Latest")	Introductory Leaflet	August 2019
<a href="#">Management of individual ash trees with Ash Dieback</a>		7 Aug 2019
<a href="#">Managing Woodland SSSIs with Ash Dieback</a> (FC/NE)	Operations Notes	24 June 2019
<a href="#">Managing Ash in woodlands</a>		20 Sept 2018
<a href="#">Ecological Impacts of Ash Dieback and Mitigation</a>	Leaflet	July 2017

Other Guidance		
<a href="#">Ash Dieback – Practice Guidance</a>	Arboricultural Association	Nov 2019
<a href="#">10 Case Studies</a>	Royal Forestry Society	July 2019
<a href="#">Ash Dieback – An Action Plan Toolkit</a>	Defra/Tree Council	Feb 2019
<a href="#">Safety Guidance Note – Felling Dead Ash</a>	Forest Industry Safety Accord/Euroforest	April 2018
<a href="#">ADB – Farmer Information Sheet</a>	NFU/FWAG/Devon Ash Dieback Resilience Forum	Sept 2019

### Tree Planting

The Woodland Trust website provides advice on planting trees, including which species to plant, where to plant them, and how to plan them. This can be found at <https://www.woodlandtrust.org.uk/plant-trees/advice/>.

For urban areas, a leaflet '[So you want to plant more trees?](#)' provides advice to councillors and other local decision-makers on managing tree-planting and what needs to be thought through before going ahead with tree-planting.

### Trees in agricultural settings

The [Agroforestry Handbook](#) provides useful, practical guidance on agroforestry - land management whereby trees or shrubs are grown around or among crops or pasture.

Hedgelink UK has advice on managing hedgerows, which can be found at [www.hedgelink.org.uk/index.php?page=23](http://www.hedgelink.org.uk/index.php?page=23).