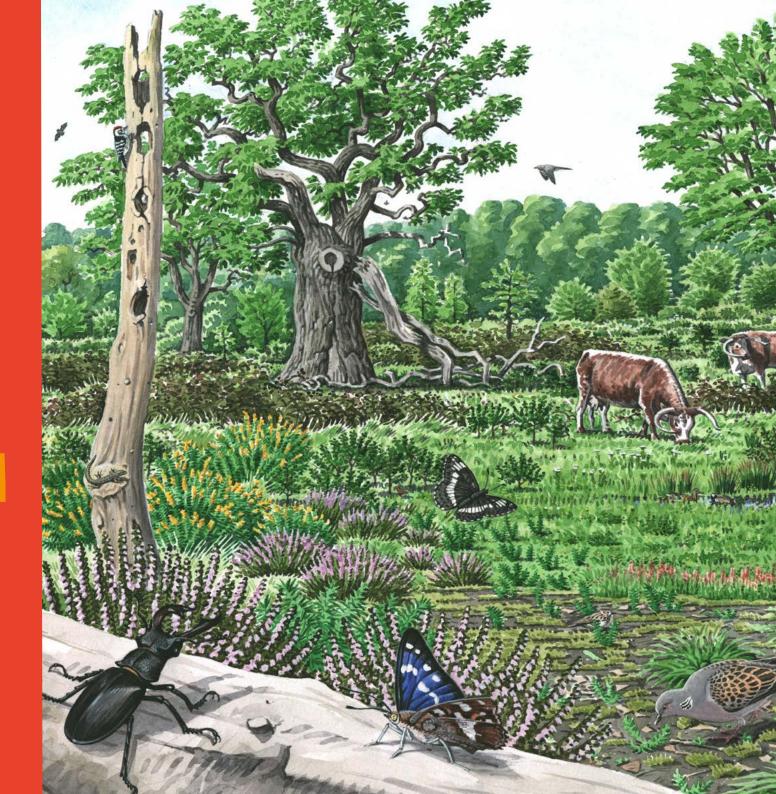


Creation of Wood Pasture Systems

Toolkit



This toolkit will help National Trust teams refine their plans for the creation and restoration of wood pasture and ensure that new projects deliver the maximum benefit for nature, people and climate.

The toolkit provides examples of six broad types of wood pasture system: three in the uplands and three in the lowlands. The idealised illustrations of different landscapes twenty years after their creation may help property teams agree a shared vision for new wood pasture at a field, farm or landscape scale.

There are also recommendations and considerations to assist teams in **creating high quality wood pasture**, assuming that the starting point is conventionally managed farmland.





Wood pasture as a cultural landscape

Areas of existing wood pasture are very significant cultural landscapes.

Common remnant wood pasture landscapes include historic deer parks and other highly significant designed landscapes, as well as mediaeval hunting forests, wooded commons and other working landscapes formed by centuries of human use.

Given the cultural significance of wood pasture systems it is vital that we plan to maximise the benefit of new projects for people as well as for nature, interpreting and enhancing the story of our places while creating accessible and inspirational experiences.

Even where we intend to allow natural processes to develop with less human influence, we should maintain an awareness of and respect for the past, current and potential future cultural context of the landscape.

'Wood pasture, of one form or another, runs deep in human nature."

Oliver Rackham



Wood pasture as a habitat

Wood pasture is one of Britain's richest habitat types.

Although existing wood pasture is always a result of human management it replicates the probable earlier landscape in which British wildlife evolved, before significant modification by humans: a dynamic mosaic of open-grown trees, thickets of trees, thorny scrub, and open habitats such as grassland, wetland or heath, with continual changes in vegetation structure driven by grazing animals.

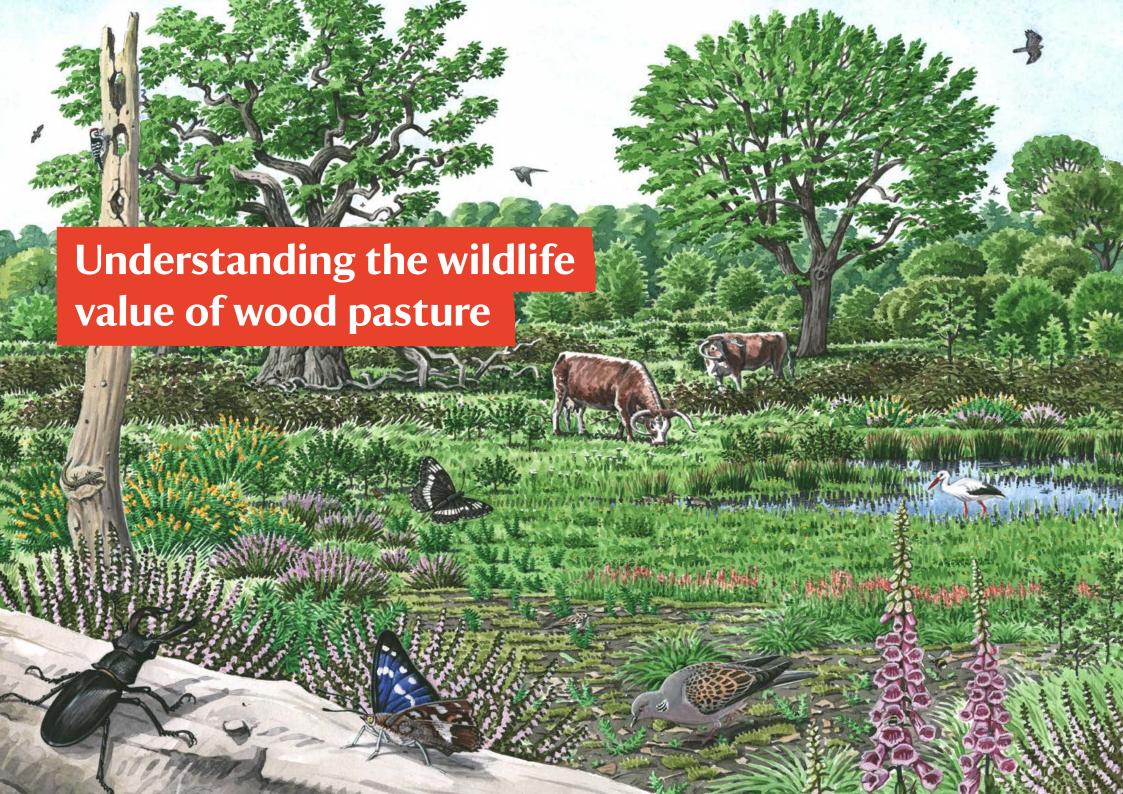
The variety of tree and plant species and the great complexity in structural diversity creates homes both for the species that use each habitat type and for many species that evolved to need a combination – which, due to the current lack of suitable habitat mosaics, are often less common species. Wood pasture is a UK BAP Priority Habitat and incorporates elements of other Priority Habitat types.











Understanding the wildlife value of wood pasture

Wood pasture is one of our richest habitats due to the range of features and the interactions between them.

Even where there are significant cultural considerations in the design of new projects it is important to have an awareness of what makes existing wood pasture so important for wildlife, and to include as many of these features as possible.

Wood pasture landscapes that are rich in the whole range of habitats should also play a greater role in deepening nature connection and increasing visitor enjoyment.

Key habitat features of existing wood pasture

- Ancient trees typically open grown trees
- Clumps or groves of trees of all age classes
- Scrub
- Open space e.g. species-rich grassland, heath and/or wetland
- · Areas of bare ground
- · Standing and fallen deadwood

For all types of wood pasture, like most habitats, bigger is better. Planning wood pasture at a large scale also allows for increased complexity, where each component can be bigger while also having more variation within it.

A rule of thumb is that trees, scrub and open ground should cover a third each by area,

but these proportions will vary between types of wood pasture and depending on the objectives and factors involved in any one scheme. The richest existing wood pasture landscapes have a maximum of 50% open space – and the open space itself is a diverse combination of rough sward with flowering plants, bare ground, wetland and other components.

Wood pasture is more than just 'trees in a field' - the range of other features is vital.

Changes to the type of livestock present and the detail of the grazing regime are likely to be necessary to allow the development of scrub, increased structure and species diversity in open habitats, as well as improvements in soil health.

Soil nutrient status is fundamental: most habitats, including all types of wood pasture, require low nutrient levels. Fertilizers should not be used and in most circumstances stocking should be low enough to avoid the need for supplementary feeding.





This toolkit is an aid for property teams to help design exceptional wood pasture that forms brilliant habitat and enhances the cultural significance of our places.

The toolkit assumes that we already have a good understanding of the land in question (including its existing ecological value and historic significance) and that an informed, collective decision has been made that converting it to a wood pasture system is the most appropriate use to deliver our strategy.

The six illustrations show idealised types of wood pasture twenty years after their creation through changes in livestock types and numbers, tree planting and/or natural colonisation. The illustrations and associated design considerations may be useful to property teams in refining the design of new projects to ensure they reflect local cultural factors, provide exceptional habitat and meet our other objectives.

There will always be additional local considerations and the illustrations and text are not intended to be definitive. They should be used as aids to conversation in determining the broad type of approach that may be suitable for a particular place: in reality, the boundaries between the six types are artificial and they exist along a spectrum. There is wide variety in existing wood pasture systems even within each example type and it is important to pay close attention to local detail in terms of Spirit of Place, ensuring local distinctiveness and sustaining the cultural heritage of the area – but all new projects should deliver great things for nature.



Wood pasture and woodland

There is no absolute distinction between wood pasture and woodland, and many woods that are very rich in nature may have a high proportion of open space – and could even have a low level of conservation grazing. It is important to recognise that all wooded habitats exist on a spectrum rather than in strict categories, but equally there are important differences in the creation of wood pasture and the creation of woodland: primarily in the fact that grazing will definitely be present (at least in the long term), but also in the proportion of scrub species and open habitats.

Great guidance on woodland design is already available in the Woodland Trust's guide to woodland creation, some of which will also be useful for wood pasture: **Woodland Creation Guide - Woodland Trust.**



Designed landscapes

Designed landscapes like historic parkland were typically laid out between the seventeenth and nineteenth centuries to create awe-inspiring landscapes where the owners of stately homes could entertain and impress visitors, although many such sites have their origins in earlier Medieval deer parks.

Other examples include pleasure grounds, remnant deer parks and other distinct types of designed landscape. Existing wood pasture within this type is typically a highly significant component of the landscape, a conscious design choice and critical to how the site was meant to be experienced, particularly in terms of the visual connections between places and features. Where we plan to create designed landscapes it's typically in places where we aim to restore or extend an existing historic design.

What to look for



- May feature avenues and/or open-grown trees, as well as denser stands, clumps and woodland belts laid out in formal designs.
- Tree species regeneration is typically by planting rather than natural colonisation.
- Some designed landscapes include preexisting ancient trees, and may embrace wilder elements such as deadwood habitat

 particularly where there is a Picturesque influence.
- Some designed landscapes don't include as much scrub, deadwood or as wide a range of habitats as would be ideal for wildlife.
- Recent management of many designed landscapes has seen overgrazing, leading to a lack of diversity in the sward structure, and/ or other form of agricultural intensification including fertiliser application.



Where to find great examples

Examples of existing lowland designed landscapes







New lowland designed landscapes

Design considerations

Designed landscapes have high cultural significance.

It is particularly important to consult regional archaeologist, curator and gardens & parkland consultant as well as nature conservation and land use & farming advisers.

Design is likely to be led or inspired by heritage factors.

We're typically restoring or reflecting a lost designed landscape, or extending an existing landscape. Research into key phases of historic design is essential.

Views, vistas and sightlines will be important

(both within and beyond the site) - as well as an understanding of intended routes of access.

Scrub, groves of trees, and other habitat features should be incorporated wherever possible

- typically outside views and vistas, and allowing natural colonisation where appropriate.

Grazing should ensure good structural and species diversity in the sward - which may be supplemented to create new areas of species-rich grassland. Avoid agricultural

inputs - there should be no use of fertilisers and supplementary feeding of livestock should be avoided.



Wood pasture

Existing lowland wood pasture outside designed landscapes typically also has high cultural significance – it may be found in remnants of royal hunting forests and in other historic landscapes like old commons where local people often had rights to graze animals and gather other products. The cultural significance of this type is typically not by design but due to the intensive use that people made of the landscape, forming its characteristic features such as pollarded trees and the combination of scrub and open habitats.

What to look for Typical features of existing lowland wood pasture



- Existing examples are more likely to feature more of the habitat components of wood pasture: open grown trees, groves and scrub as well as open space.
- Recent management may have involved over-grazing, leading to a lack of diversity in the sward and reduced natural colonisation of scrub and tree species. Conversely, grazing stopped in some existing wood pasture landscapes and they have become more wooded.
- There may be a tradition of pollarding (and/or coppicing), and existing trees may be lapsed pollards or coppice.
- The history of land use and lack of ground disturbance means that archaeological earthworks and other heritage features often survive well.



Where to find great examples Examples of existing lowland wood pasture







New lowland wood pasture

Design considerations

Natural colonisation of scrub (including bramble) and tree species should be encouraged where possible - but planting may be appropriate in ensuring rapid development, species diversity and/or to reflect cultural factors.

Ensure a wide range of planting or establishment types:

- Open grown trees that have the space to reach their maximum natural crown spread.
- Groves of tree species.
- Individuals and clumps of scrub species.

There may be crossover between historic wood pasture and a natural processes approach, and many of the considerations may be similar. This section is likely to be more relevant at a smaller scale and/or where the desired outcome is more closely defined (in terms of the desired balance of trees, scrub and open space, or because the design reflects local cultural factors).

Ensure naturalistic planting design

 avoiding straight lines and formality.



Increase diversity in the ground layer

Type and density of livestock should create variety in the sward and allow natural colonisation where possible. Techniques to create species-rich grassland may also be appropriate.

Avoid agricultural inputs. There should be no use of fertilisers and supplementary feeding of livestock should be avoided.

Innovation in planting design can reduce the need for tree protection and increase naturalness – e.g. using scrub species to protect canopy trees from grazing, planting clumps at high density.

Consider creating new pollards once young trees are established - if there is a tradition of pollarding on site.

Plan for the future.

Ongoing management (e.g. by grazing) should be designed to ensure dynamism in the structure of the landscape in the long-term.



Natural processes projects

Habitat restoration projects using natural processes driven by grazing herbivores create a form of wood pasture that may most closely reflect the landscape in which British species evolved, before significant modification by humans. Low grazing pressure allows the development of thorny scrub, which in turn protects tree saplings from browsing.

This approach does not seek to recreate a historic cultural landscape but neither should it seek to replicate a theoretical 'pre-human' landscape; it should typically be less focussed on any defined outcomes and the process itself is the key factor. The potential benefit to people and reference to existing historic and cultural considerations (including local communities) should remain at the heart of any scheme, as well as an awareness of the current cultural drivers to which we're responding in our decision-making.

What to look for Typical features of existing lowland natural processes projects

- Often no defined end result the process of allowing natural colonisation and other habitat components to develop is the key feature.
- Development of scrub and tree species is typically the result of natural colonisation.
- Existing mature trees are typically retained, although denser areas of woodland (especially plantation) may be managed.
- A range of livestock is typically used to ensure dynamism in the landscape and to create important, underrepresented niches and processes – e.g. pigs may create bare ground which is habitat in its own right as well as promoting natural colonisation.
- Can include positive management of existing archaeological and historic features.



Where to find great examples

Examples of existing lowland natural processes projects







Lowland natural processes projects

Design considerations

It is essential to ensure a natural-processes approach is appropriate in terms of landscape character, cultural heritage and other factors - and to take measures to enhance cultural elements of the existing landscape where necessary. People should still be at the heart of a natural-processes approach - whether in terms of increased opportunities for diversified visitor businesses, farmers managing livestock, visitor infrastructure or the legibility of the landscape.

Ground preparation may ensure rapid colonisation by scrub and tree species

- for instance using pigs or by hard grazing prior to stock exclusion.

Allowing scrub, trees and other features to develop naturally under very low-density extensive grazing is likely to see the most effective and interesting outcome.

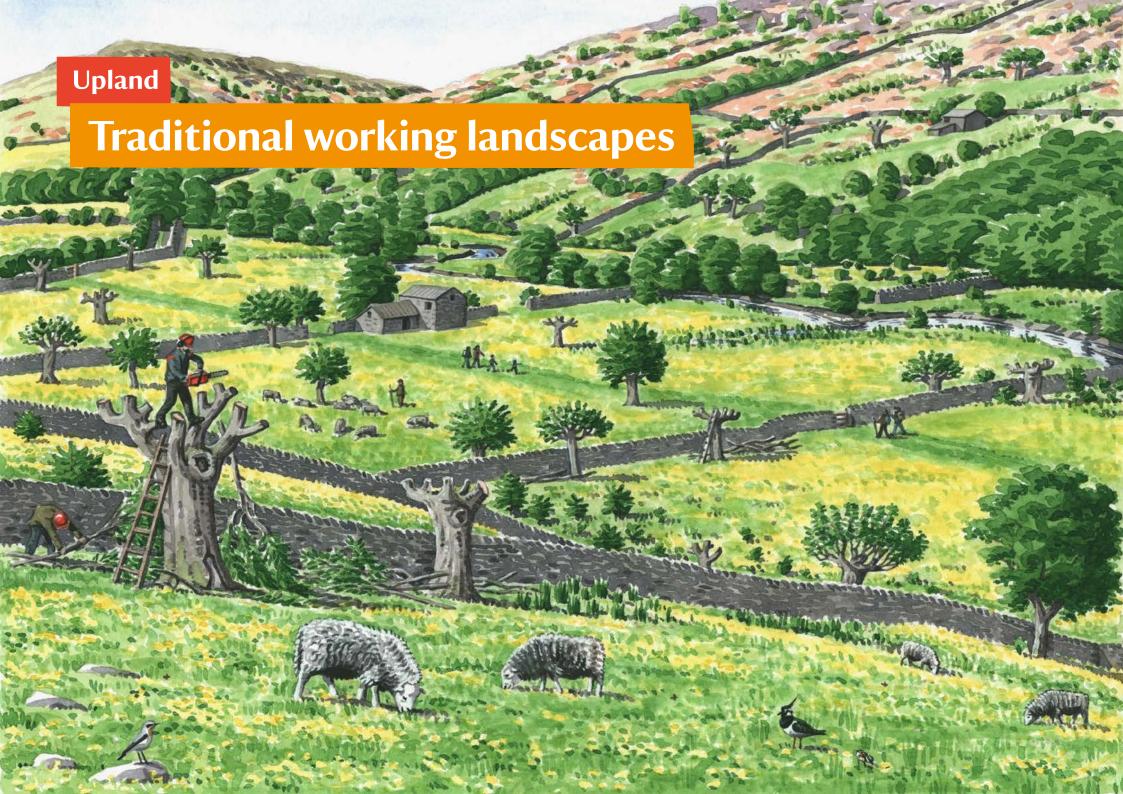
Enrichment planting may be necessary to ensure a suitable range of tree species

- we should typically aim to see at least three canopy tree species well-represented. A range of animals should be included where possible.

Pulses of heavier and lighter grazing over the course of years may allow further dynamism in the mosaic of habitats

- and drive beneficial changes in structure in the long term. We may be more comfortable accepting denser or more open overall structure than in more closely designed schemes

- although grazing levels should be reviewed regularly to increase dynamism or achieve additional benefits for wildlife.



Traditional working landscapes

Some upland landscapes, such as the 'in-bye' land in the valley bottoms of the Lake District and Yorkshire Dales, have very high cultural significance for their combination of grazing land – often species-rich hay meadows – with pollards and other trees. The pollards were cut for fodder and to provide a range of wood products. The two layers of land use may have been worked for many hundreds of years, but traditional management has typically declined since the Second World War.

What to look for Typical features of existing upland traditional working landscapes

- Ancient and veteran pollarded treesmay still be in rotation.
- · Open-grown maidens and clumps of trees.
- Grassland may be species-rich upland meadows or agriculturally improved hay or silage.
- Historic field systems separated by dry-stone walls and/or hedgerows.
- Like formal lowland landscapes, this type may not feature as much tree cover, scrub or natural colonisation as would be ideal for nature to thrive. Grassland management may be intensive, even if it has high ecological significance (e.g. meadow).









New upland traditional working landscapes

Design considerations

Design is likely to be defined by heritage considerations and other local factors.

There may be characteristic design features in neighbouring existing wood pasture or the wider landscape – e.g. trees along boundaries and tracks, or spread throughout fields.

Tree species regeneration is typically by planting rather than natural colonisation.

Pre-existing trees should be incorporated into the design - and given space to achieve their natural crown spread.

Opportunities should be identified to include scrub and other habitat features, which are often underrepresented in existing examples.

Increase diversity in the ground layer.

Recent management of some upland landscapes has seen overgrazing and other forms of agricultural improvement, leading to a lack of diversity in the sward structure and species (e.g. management for silage) – it is important to ensure stocking densities and/or grassland management will achieve significant benefits for wildlife and for soil health.

Avoid agricultural inputs.

There should be no use of fertilisers and supplementary feeding of livestock should be avoided.



Wood pasture

Like the lowlands, there are much more extensive areas of the uplands where wood pasture is less formal but where it retains high cultural significance due its historic importance through traditional practices such as pollarding and communal grazing. Upland wood pasture may feature pollarded trees but may also feature open-grown maidens or have a higher density of scrub species. Ffridd in the Welsh uplands could also fall into this type and would typically feature fewer canopy species and more scrub.

What to look for Typical features of existing upland wood pasture



- Existing examples may have a wider range of habitat features and be richer in wildlife, e.g. more scrub, a wider range of age classes in trees
- Recent management may have involved overgrazing leading to a lack of diversity in the sward and reduced natural colonisation of scrub and tree species. Conversely, some areas may have been 'in-filled' with younger trees due to the cessation of grazing (although to a lesser extent than in the lowlands).
- There may be a tradition of pollarding and/or coppicing, and existing trees may be lapsed pollards or coppice.
- There may be bracken-dominated areas, which form an important habitat but can also limit natural colonisation of scrub and tree species.









New upland wood pasture

Design considerations

Ensure a wide range of planting types:

- Open grown trees that can reach their maximum natural crown spread.
- Groves of tree species.
- Clumps of scrub species.

Ensure naturalistic planting design

- avoiding straight lines and formality.

Natural colonisation of scrub (including bramble) and tree species should be encouraged

- and could be the primary mode of tree colonisation where appropriate.

Bracken may need managing to ensure the success of planting or natural colonisation

- but its importance as habitat needs to be considered.

Type and density
of livestock should create
variety in the sward - it should
be low enough to allow natural colonisation
of scrub and tree species, and improve
soil health.

Some new trees may be pollarded if there is a history of pollard management at the site.

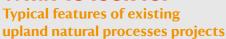


Natural processes projects

Current upland conservation projects using natural processes driven by large herbivores create a form of wood pasture at significant scale. Very low-level grazing allows the natural colonisation of scrub and tree species, and other animals are sometimes included to ensure the development of other processes that mimic nature.

These approaches do not aim to recreate a historic cultural landscape but neither should they seek to replicate a theoretical 'pre-human' landscape: they are a response to the crisis in biodiversity where space is created for nature to develop with less human influence, and where the process itself is the key factor. At their best, however, people are at the heart of these schemes, whether as visitors, local communities or workers, and projects should be undertaken with both sensitivity to existing historic factors and an awareness of the current cultural context driving our decisions.

What to look for



- Often no defined end result the process of allowing habitats to develop more naturally is the key feature.
- The development of scrub and tree species is typically the result of natural colonisation.
- Existing mature trees typically retained, although denser areas of woodland (particularly plantation) may be managed.
- A range of livestock is typically used to ensure dynamism in the landscape and to create important, underrepresented niches and processes – e.g. pigs may create bare ground which is habitat in its own right as well as promoting natural colonisation.
- More typical in landscapes (or areas within landscapes) with lower cultural significance or sensitivity. Cultural factors must still be considered and can be managed even within projects led more broadly by natural processes.



Where to find great examples

Examples of existing upland natural processes projects







New upland natural processes projects

Design considerations

Allowing scrub, tree species and other habitat features to develop naturally under extensive grazing is likely to see the most effective and interesting outcome for nature.

Enrichment planting may be necessary to ensure a suitable range of tree species

- typically at least three canopy tree species should be well represented.

It is vital to assess the seed source.

Where there is no seed source, planting at a wider scale may be necessary and should be designed to be as naturalistic as possible.

People should be at the heart of the project.

It should be recognised that the current form of all Britain's landscapes is the result of human culture, and that sensitivity will be needed to respect and enhance cultural heritage and human factors in all schemes.

A range of animals should be included where possible - to increase the diversity in the sward layer, colonisation of scrub and tree species, bare ground and other habitat features.

Pulses of heavier and lighter grazing over the course of years may allow further dynamism in the range of habitats - driving beneficial changes of structure in the long term.







Wood meadow is a traditional land use in parts of mainland Europe (particularly the Baltic states) where trees co-exist with species-rich grassland that is typically managed primarily by cutting.

It has potential to deliver many of the benefits of wood pasture in locations where grazing by livestock is undesirable or impractical. Wood meadow has high relevance to upland traditional working landscapes and may also be useful for other projects where wood pasture is the ideal outcome but grazing isn't possible.

More guidance can be found on the Woodmeadow Trust's website: Home :: Woodmeadow Trust.



Agroforestry

Agroforestry is simply a broad description of agricultural systems which incorporate trees.

Wood pasture is therefore a type of agroforestry, falling within the 'silvopastoral' range of systems. There are other, more formal silvopasture systems that may create great benefit for biodiversity, soil health and other ecosystem services while still enabling (and sometimes increasing) agricultural production. They are not, however, typically as rich in nature as wood pasture so they are not considered here – but their use may be appropriate in some places depending on site objectives.

Similarly, the other broad type of agroforestry is silvoarable, which has very many benefits over conventional arable farming but is not relevant to a consideration of wood pasture.

Planting plans & natural colonisation

Planting should be designed with thought for the size of the trees at maturity and to create the whole range of habitat features including open-grown trees, groves of trees, scrub (both single specimens and thickets) and open space.

Natural colonisation of scrub and trees is often the most desirable and effective way to establish wood pasture that forms great habitat and looks natural. It is important, however, to recognise that some thought and preparation will be needed to restore ecological processes quickly. The existing sward may need reducing by hard grazing, for instance, and the ground prepared by the use of machines or by animals such as pigs. It may be necessary to establish a first generation of trees that will go on to provide a seed source for future natural colonisation.

Any planting design choice (including opting for natural colonisation) must take account of the historic environment and historic landscape character, both in terms of avoiding any negative impact and of the potential to enhance the landscape and interpret heritage for visitors. It is essential to reflect local distinctiveness by making reference to existing local wood pasture types and not to create 'generic' wood pasture.

The Woodland Trust's guide to woodland creation includes examples of planting plans that better replicate nature than trees planted at regular spacing or in rows, neither of which are likely to be appropriate for the creation of most wood pasture systems.





Tree species selection

The Woodland Trust guide and associated Tree Species Handbook provide a comprehensive guide to the species appropriate for a range of British native woodland types; they can inform appropriate species selection for wood pasture when considered alongside the characteristic composition of existing local sites.

- The widest possible range of appropriate species should be included to ensure resilience to climate change and future threats.
- It may be appropriate to include some planting stock from a more southerly provenance to increase resilience to climate change.
- Planting in designed landscapes should be informed by an understanding of the original design intent and species palette, and may include non-native species.

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Tree protection & ensuring successful establishment

It can be challenging to establish trees in areas where livestock graze but we should try to choose methods of tree protection that reduce resource use and allow the rapid development of rich, naturalistic habitats.

- It may be necessary to stop grazing entirely for a period of years to allow planted trees to become established without plastic protection, or to allow a pulse of natural regeneration – including the essential scrub component.
- Projects using natural colonisation of scrub and tree species are likely to require only extremely low levels of grazing.
- Where livestock must be present among planted trees (or where deer can't be excluded or controlled), tree tubes or individual tree cages are likely to be necessary for open-grown trees.
- Fenced exclosures planted at high density can be used to create clumps of scrub or tree species without the need for individual protection. It is essential that grazing outside the exclosures is low enough to improve soil health, increase diversity in the sward, and preferably allow natural colonisation.

- Planting at a higher stem density with less individual protection and accepting losses can reduce resource use and aftercare requirements, and may produce a more natural and visually appealing landscape.
- Rubbing posts can help avoid the impact of cattle on young trees and tree protection.
- Thorny scrub species can be planted around canopy trees to protect them.
- It is essential to plan and budget for aftercare.

Woodland guidance: tree protection

Livestock & future management

The long-term management of livestock is integral to the creation of high-quality wood pasture landscapes.

- As above, it may be necessary to stop grazing for a period of years to allow a first generation of scrub and trees to develop.
- Wherever possible, cattle should be preferred to sheep as they create a more complex sward structure and don't have such a severe impact on young trees. Their dung is also an important habitat in its own right.
- Wormers and other veterinary medicines should be avoided wherever possible due to their impact on soil fauna and fungi.

- Holistic mob grazing (where animals are moved on a short rotation) and pulse grazing (where stocking densities vary dramatically over a longer period of time

 e.g. years) can both be useful in allowing tree regeneration and developing structure in the sward and scrub component.
- Livestock will need to be managed in a
 way that creates conditions for trees, scrub
 and other habitats to develop. Numbers
 should be set to ensure soil health and
 diversity in the sward, as well as to avoid
 the need for supplementary feeding.
 This may require a reduction in livestock
 numbers in comparison with conventional
 agricultural systems.
- A wider range of animals may be beneficial in creating a range of habitat niches – e.g. pigs, deer.
- A high standard of animal welfare remains essential in all projects.



Further guidance on management of existing wood pasture systems

NT parkland policy and guiding principles

Natural England: Woodland, parkland and wood pasture management

UK Wood Pasture & Parkland Network

Woodland Trust - Wood Pasture & Parkland

Wood-pasture and parkland (UK BAP Priority Habitat description) – Revised 2011 (jncc.gov.uk)

Veteran Trees: A guide to good management by Helen Read

Ancient and other veteran trees: further guidance on management edited by David Lonsdale

