

The Woodland Trust was founded in 1972 and is the UK's leading woodland conservation organisation. The Trust achieves its aims through a combination of acquiring woodland and sites for planting and through advocacy of the importance of protecting ancient woodland, enhancing its biodiversity, expanding native woodland cover and increasing public enjoyment of woodland.

The Trust relies on the generosity of the public, industry, commerce and agencies to carry out its work. To find out how you can help, and about membership details, please contact one of the addresses below.

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Ancient woods and their special value

Ancient woods and other places with an unbroken history of tree cover are uniquely valuable. Although diminished to a tiny fraction of their former extent, they are still widespread in our countryside, and occasionally in our towns. Many have been recorded on ancient woodland inventories, but others, often the smaller fragments, remain unidentified and are such are especially vulnerable to damage and destruction.

The wildlife value of these natural heirlooms lies in the fact that their ecological communities have developed over a long period of time, with features accumulating over hundreds or thousands of years. The result is a complex and integrated system, but four key 'High Conservation Value' ancient woodland features can readily be identified:

- **Old trees and deadwood** – important in themselves and for the bats, insects, fungi, and lichens that live on them
- **Woodland flora** – characterised by species that survive best in woodland conditions
- **Woodland soils** – often undisturbed and home to some of the most hidden, but also most functionally important elements of a woodland's system such as mycorrhizal fungi
- **Human traces** – some ancient and hidden among the trees, others from the present

Because these features, by definition, take a very long time to develop, they also take a very long time to replace, if they can be replaced at all. That is why their protection is a priority.

We believe that the unique features of ancient woods should be maintained or enhanced, wherever they are found.

Ancient woods and land management

For many landowners ancient woods form part of a landholding that is also a business. Game, agriculture, timber and woodfuel production may well be the activities that support and fund woodland protection. This productive use of land is an essential part of a sustainable future. But so too is the protection of irreplaceable elements of the land's cultural and biological inheritance.

There is mounting evidence that wooded landscapes have a role in the management of ecosystem services such as water quality, nutrient cycling and natural pest control. While these services may not contribute obvious commercial benefits to a landholding, they can attract grant support (see page 13), and are likely to be central to maintaining productivity in the long term. They also add meaning and beauty to the landscape.

Land management can be as much about deciding what not to do as it is about taking action. The special features of ancient woods will generally thrive if left alone although there are some situations in which positive management is needed to retain continuity.

Whether a wood is actively managed or not, some special attention is required to:

- (1) Identify the special features of these sites; and
- (2) Take a few simple steps to secure, maintain and enhance their value.

This guide sets out a straightforward process for doing this.

How to use this guide

This guide is aimed at people who own or manage land on which there are woods and trees. It provides the basic tools needed to get started on identifying ancient woodland features and gives advice on protecting them. It is not a detailed or prescriptive manual; getting this sort of work right depends on being responsive to site-specific knowledge, conditions and circumstances. The guide also provides guidance on combining the protection of ancient woodland features with other management objectives and activities.

Details are given on pages 3 and 4 about how to recognise and find ancient woodland features. The table on pages 11 and 12 gives details of their characteristics and sensitivities. For more detailed sources of information, and more specific advice on Planted Ancient Woodland Sites, refer to the links listed on page 14.



Basic principles...

Whatever your management objective, ancient woods remain an indispensable part of our natural heritage. The following basic principles should apply to any place where ancient woodland features can be found:

- **No loss of area** – All losses in ancient woodland area are unacceptable. This can include the development of internal hard infrastructure, particularly in smaller woods where it has a disproportionate impact.
- **Restoration** – All damaged ancient woods, such as Planted Ancient Woodland Sites (PAWS), should be in a process of restoration which focuses on securing and enhancing the condition of ancient woodland features.
- **Avoidance of pesticides** – Pesticides present a serious risk to the ecological communities in ancient woodland. Their use can rarely be justified beyond highly targeted applications to invasive species.
- **Features-based management** – Plans for managing ancient woods should start with first-hand, on-site assessments of ancient woodland features. Land management systems should reflect the features' characteristics, condition and distribution.

What to look for

Woodland plants

Ancient woods often contain a rich and characteristic flora. Some of their plants are widespread like bracken and bramble. Others are more particular to woods, and places with a history of woodland cover. Many of these will be familiar, for example wood spurge and yellow archangel in the lowlands, or cow wheat and sanicle in the uplands. Some are so strongly associated with old woods that they are called 'ancient woodland indicator species.'

To differentiate woodland plants from other, more widespread species, it is easiest to define them by what they are not; ie fast-growing, weedy plants. If you find smaller, more delicate looking plants, flowering and growing in the spring before the trees are in full leaf, then you should take a closer look. It might help to get to know a few of these woodland plants, see www.woodlandtrust.org.uk/awguide

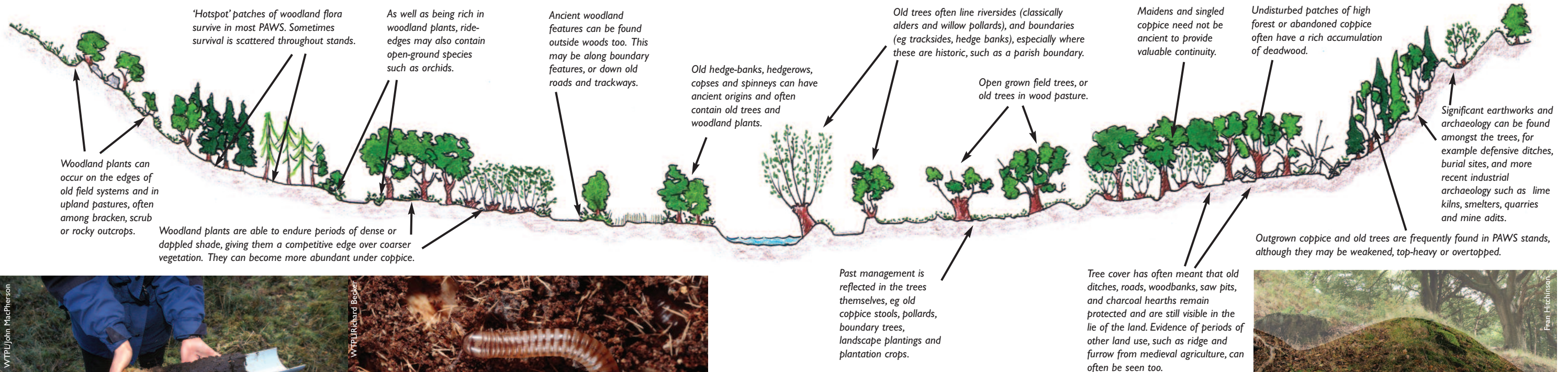


Old trees & deadwood

Old trees are a physical manifestation of continuity by simple virtue of their age. They are valuable in themselves but also for the species that live on and in them, from bats to lichens and mosses. Of particular note are the beetles, flies and fungi that are linked to the deadwood of old trees.

Old trees can be recognised in various forms, depending on their age, species and management history. Many of the signs that mark out an old tree are fairly intuitive: they might have a girth which is larger than most other trees in the wood; open-grown trees can be quite short, with wide spreading branches; they may have hollow trunks and branches; or deadwood in the crown and on the ground.

Once you 'get your eye in' you might notice signs of historical management, for example pollarding, or relatively young stems growing from a large and much older coppice stool. Many old trees, both in and outside woods, will have developed in open-grown conditions, such as those found in wood pasture.



Woodland soils

Woodland soils are often very different from those found elsewhere. This is partly due to origin (they were where people chose not to farm), and partly due to history (little or no ploughing, fertilising, liming). The resulting soils can be layered, patchy and complex, and they are likely to be alive with fungi, insects, microbes and worms.

While soils may be one of the most critical elements in an old wood's ecology, they are difficult to identify positively. The presence of other ancient woodland features – abundant fungi in autumn or other observations that point to a lack of disturbance (steep slopes, difficult access, and rocky outcrops) can be associated with their presence.

Take a precautionary approach, if there is no evidence that soils have ever been ploughed, excavated or disturbed in other ways, then assume that they are undisturbed.

Human traces

Ancient woods have been providing for humans for centuries; and traces can be found of their use for fuel, shelter, hunting and keeping livestock. Other traces of human activity have simply become incorporated within the wood over time, such as settlement, defence, transport and old field systems. These vestiges of past human activity preserved in ancient woods, have become an important part of their fabric and ecology.

Significant human traces may be documented, or scheduled as Ancient Monuments. Other features may be found on old maps, or records held by local councils. However, most will only be discovered by going out into the wood. On the ground features may be obvious, such as walls, dams and buildings. Others may only appear as bumps and hollows in the ground that do not fit with the slope or soil conditions around them. These can be easiest to see in winter, when there is little vegetation. Straight edges are also likely to be man-made. Traces may also be found in the trees and plants themselves; there may be obvious species introductions, or signs of coppicing or pollarding. More subtle signs may show up as areas of distinct vegetation, such as nettle patches, where buried features have altered soil characteristics.



Protecting ancient woodland features

Our approach is features-based, focusing on the identification and protection of the special features of ancient woods. We also emphasise the importance of on-site knowledge; finding and assessing ancient woodland features and thinking about their management. Effective decisions and practice can rarely be achieved remotely.

The process has two steps, both of which can be carried out in the field:

Step 1: Finding ancient woodland features, in order to:

- Identify the ancient woodland features on the land holding; and
- Record where the features are found


Step 2: Making an assessment and coming up with a plan, in order to:

- Assess factors likely to influence the survival or condition of ancient woodland features; and
- Prioritise actions to protect them

Blurred boundaries

While it is convenient to think of different facets of the landscape such as woods or open ground as distinct categories, reality is less tidy. Recognising this can be important to the management of ancient woods in three key ways:

- **Ancient woodland features outside woods –** These may be relicts or ‘ghosts’ from former woods, or areas of wood pasture and parkland with open-grown ancient trees, developed over centuries in their own right. In either case they are of value, and should be recognised and protected.
- **Open habitats inside old woods –** Ancient woods frequently contain valuable rides, glades and ponds which are important in themselves and are often relicts of other long-established semi-natural habitats such as meadows and heaths. Opportunities should be taken to incorporate their protection into woodland management.
- **The effects of adjacent land use –** The management of adjacent land, particularly agricultural land, can have a critical effect on ancient woodland features. Wherever possible, management should be planned to take into consideration the sensitivities (and potential benefits) of features in adjacent land.



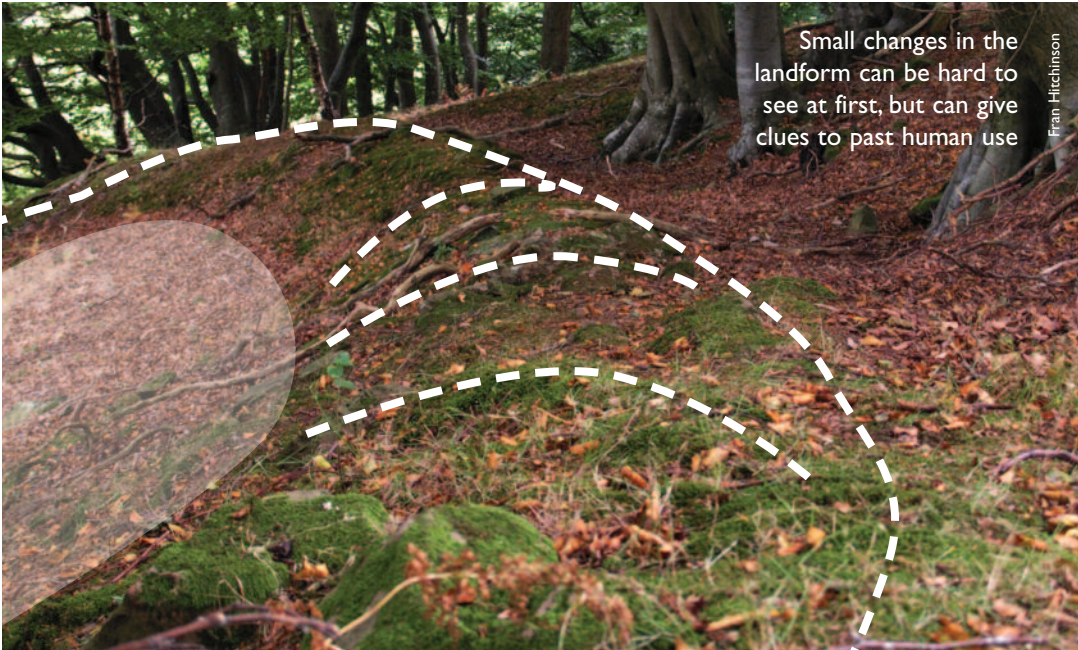
STEP 1: FINDING ANCIENT WOODLAND FEATURES

What to look for

Pages 3 and 4 give an outline description of the ancient woodland features that you should seek out and record. Additional sources of information are listed on page 14. While you certainly do not need to be an expert or an ecologist to spot ancient woodland features (this isn’t about creating lists of rare species) it is good to spend a little time getting your eye in. The trick is not so much in being able to spot ancient woodland features, as many will be familiar; it is distinguishing them from more ubiquitous components of woodland.

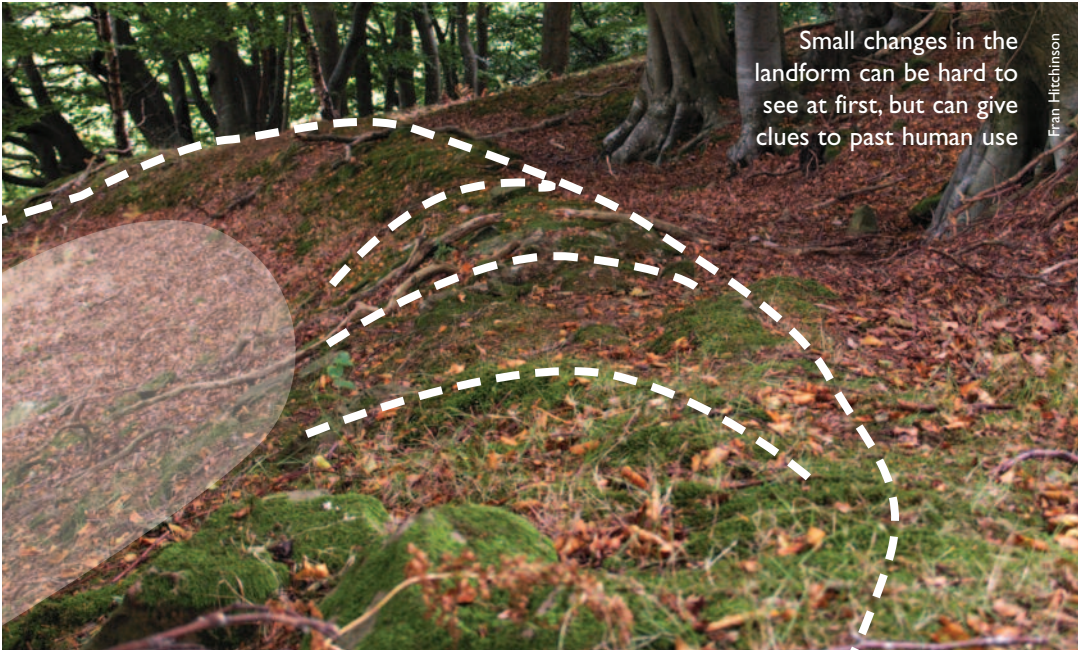
Points to note:

- Distributions of features are likely to be patchy and variable; for instance a woodland edge, ride-side, or stream may have different components from the middle of a stand
- Finding one ancient woodland feature will often mean others are close-by




Where to look

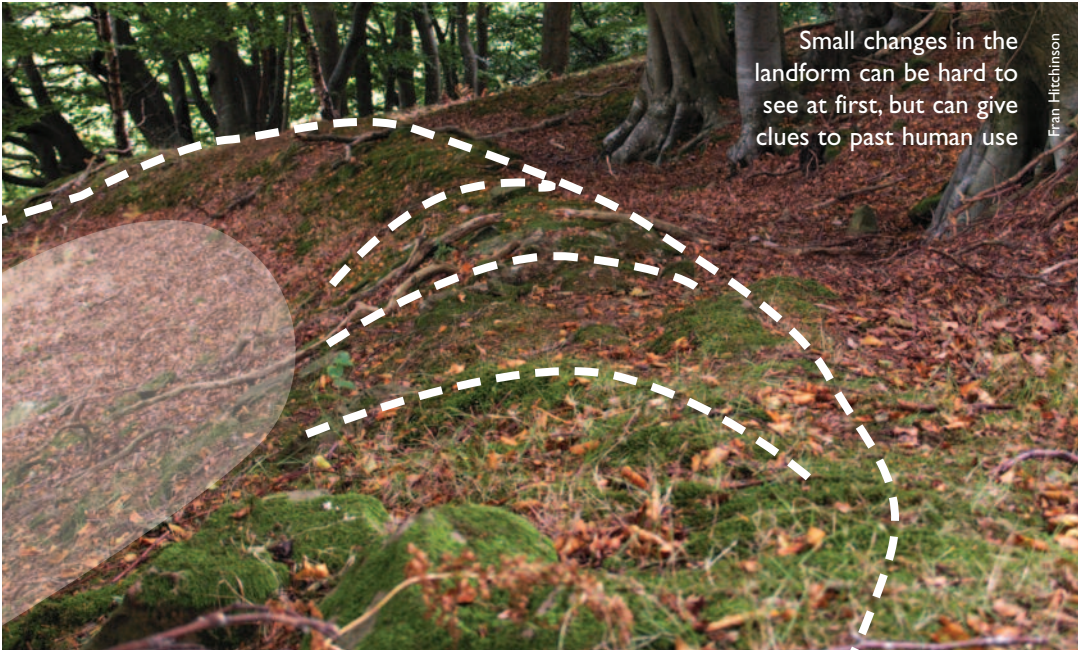
The best places to find ancient woodland features are in ancient woods. Ancient woodland inventories generally record sites over two hectares for which there is evidence of continuous woodland cover (to view the inventories see Sources of information, on page 14). While inventoried ancient woods can be good places to start, their features are very often found in other parts of the landscape too; in other woods, small copses, commons and parkland, along old boundaries, in old field systems, down the side of old tracks and roads and beside rivers. Wherever they are found, they should be protected.




- Sources of information that may help:
- People with local knowledge;
 - Advice from FWAG, the Forestry Commission, the Forest Service in Northern Ireland or the Woodland Trust
 - Ancient woodland inventories
 - Management plans
 - Old maps
 - Aerial photographs – often available on the internet



Ordnance Survey maps can highlight historic features hidden by tree cover



Old maps often show individual trees which may still be in the landscape today

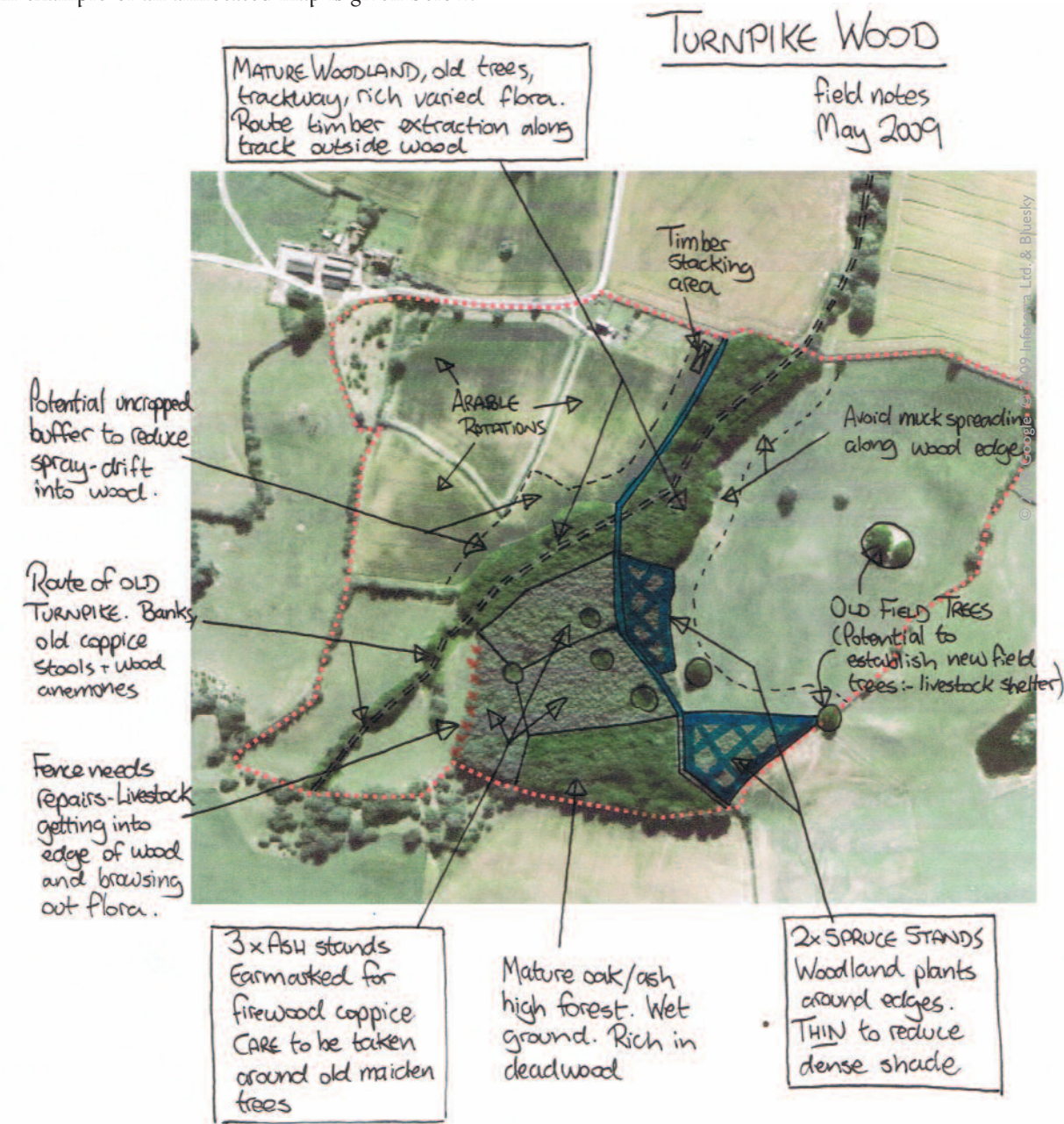


Ancient woodland recorded on the inventories gives an indication of past landscapes



How to record what you find

One of the best ways to record observations is to annotate a map by marking areas where ancient woodland features are concentrated and making notes on your observations. These notes need not be technical or scientific; the aim is to inform management decisions and to describe the distribution of ancient wood features so they can be relocated in the future. An example of an annotated map is given below:



STEP 2: MAKING AN ASSESSMENT AND COMING UP WITH A PLAN

What to consider

Having identified and recorded the distributions of ancient woodland features the next step is to assess whether positive management is needed to protect them. The best place to make this assessment is on site, at the same time as carrying out Step 1. Consider and record any factors you think will be relevant to the condition of the ancient woodland features you have identified.

Take into account:

- 1. Observations of conditions in and around the old wood features

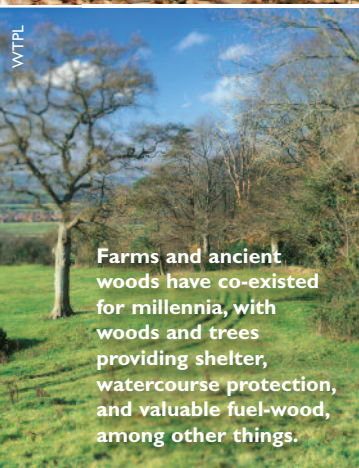
- 2. Observations and knowledge of current and upcoming management activities; and
- 3. What you know about their characteristics and sensitivities, referring to the information on pages 3-4, and on pages 11 and 12

Management responses

Some ancient woodland features may require specific action to secure their future. But in the majority of cases the most appropriate response will simply involve taking their presence into account when planning other management activity. A good way of ordering field observations and translating them into a set of management responses is to rank them into three categories in order of urgency. These are outlined below. More detailed guidance on practical management responses is given on pages 11 and 12.

Assessment	Management response
Acute threats Anything causing damage to features, which needs to be addressed soon through management. For example old trees overtopped by conifers in a PAWS, or livestock breaking through a fence and browsing out the flora along a woodland edge.	Secure Targeted, priority actions, to be carried out as soon as possible in order to secure ancient woodland features.
Risks from current & upcoming management These may be from management operations, such as felling, timber extraction and restocking, or indirect impacts such as the creation of stacking areas. There may also be the effects of surrounding land-uses, such as arable crop spraying or muck-spreading alongside woodland edges or old hedges.	Maintain A set of adjustments to management, to be incorporated into the management regime for the wood and adjacent land.
Long-term opportunities Anything likely to threaten the protection and continuity of the ancient woodland feature in the long term. For example, are there any trees to replace collapsing ancient ones?	Enhance Opportunities or strategic changes to management that need to be incorporated into long-term management aims.
If no forest management options are planned and no acute threats exist, then management through non-intervention may be the simplest and most cost-effective means of protecting ancient woodland features.	





Reconciling objectives

All management decisions will have some impact on ancient woodland features. In the vast majority of cases the guidance given in this document should help pre-empt any major management conflicts. Where specific conflicts do occur preventing the loss of ancient woodland features should always be the priority. But exactly when an activity is likely to cause irrecoverable losses can be a judgement call. The rules of thumb below can be a useful way of judging what might cause an acceptable impact, and what might cause irreplaceable losses of ancient woodland features.

Rules of thumb

When weighing up management options try these two tests:

- 1. Trading up** – Ideally new management actions or changes of crop should improve conditions for ancient woodland features, and should never make them worse. For example:
 - A stand of larch might be gradually converted into a mixed age-class larch-broadleaf stand as a trade-up. But not a stand of Norway spruce, as this would be more densely shading and thus a trade-down
 - Reducing inputs on improved pasture next to an old hedge containing woodland flora would be a trade-up. Conversion to a conventional arable crop rotation would be a trade-down due to the increased chemical applications drifting into the wood
- 2. Using history as a benchmark** – Management options can be judged reasonably safe where their impact is not greater than that of the prevailing management over recent centuries. For example:
 - Rutting from forwarding down an old cart track may not be introducing a new level of disturbance (given past usage and rutting of the track). But deep ruts from mechanical extraction through a wet forest stand may destroy previously undisturbed soil profiles.
 - Clearfelling a broadleaf canopy over a robust woodland ground flora may be equivalent to past coppicing. But restocking with conifers or using herbicides to control weeds would introduce a new and unacceptable level of impact and risk.



Recording the process

Recording your findings

Once objectives have been reconciled and decisions made about operational priorities it is important to make a record of your findings. The plan for protecting and enhancing ancient woodland features can ideally be dealt with in a similar way to other land management objectives. In this way they can be an integral part of any management plan (eg woodland management plan, game management strategy, whole farm plan, or integrated estate management plan).

Monitoring Progress and adapting management over time

It will be useful to have a system for monitoring and recording the condition of ancient woodland features over time. This does not need to be onerous. A simple re-survey of ancient woodland features and review of any management every five years should be adequate (perhaps in line with your grant scheme or management plan period). Additional follow up checks for remedial action should be carried out whenever major management operations or other changes have taken place.



Feature	Sensitivities	Example solutions
<p>Woodland plants</p> <p>The main consideration with woodland plants is that once lost, they will generally take a very long time to return, if at all. The focus for protection should be to avoid their destruction and to avoid them being out-competed by aggressive weedy species.</p>	<p>Herbicides. Most ancient woodland plants are susceptible to herbicides eg used for weeding around trees, or drift from use in adjacent arable areas.</p> <p>Mechanical disturbance. Excessive or extensive ground disturbance, for example from timber extraction, which damages ancient woodland plants and their roots/bulbs/rhizomes.</p> <p>Sustained heavy shade. Blocks the light and suppresses the growth of ancient woodland plants, which can lead to long term loss. This could be from conifer crops, dense thicket-stage plantations or rhododendron.</p> <p>Smothering. Conifer needle litter, brash and bracken can create a dense thatch which the ancient woodland plants cannot grow through and blocks the light.</p> <p>Full light conditions. This can be a problem when the canopy is suddenly opened following a long period of dense shade, as in PAWS, or when canopy closure is likely to take a long time. In both cases coarse fast growing plants can out-compete ancient woodland ones.</p> <p>High nutrient levels. Favours weedy species. Often resulting from nutrient run-off from agricultural fields.</p> <p>Browsing. From sheltering livestock or deer. Ancient woodland plants may be completely lost if browsing is sustained or intensive.</p>	<p>Avoid pesticides; use shade to suppress weeds; buffer ancient woods with no-spray zones; use stump or stem treatments on invasive species like rhododendron.</p> <p>Record flora concentrations and plan extraction routes accordingly. Time extraction and other activities to avoid wet seasons when the risk of damage to soils and therefore plants is greatest.</p> <p>Thin and gradually replace densely shading plantation crops with semi-natural species. Re-space thicket stage plantations early. Where rhododendron is invasive, take an active and strategic approach; consider non-chemical options first and where needed work with neighbours.</p> <p>Phase-out pure conifer stands; avoid brash concentrations, especially along ride edges.</p> <p>Retaining some shade/canopy can prevent weedy species from taking over. Adopt continuous cover approaches or ensure that underwood, advance regeneration or coppice regrowth is strong before removing canopy. In-cycle coppice will generally re-establish canopy quickly enough.</p> <p>Target inputs through a nutrient management plan; create ‘buffer strips’ or wide headlands next to ancient woods; take practical precautions such as avoiding muck-spreading during wet weather.</p> <p>Control stock where there are ancient woodland features. Reinstate fence-lines which have retreated behind woodland edges. Work with neighbours to actively manage deer numbers.</p>
<p>Woodland soils</p> <p>Woodland soils, and the biological communities found in them, have relatively undisturbed histories. The main consideration is to avoid disturbance.</p>	<p>Mechanical disturbance. Through ploughing, excavation, drainage or extraction in wet conditions. This compacts and changes the soil profiles and can damage soil communities.</p> <p>Chemical damage. Pesticides, fertilisers and other chemicals such as mineral oils and fuels from machinery can damage or destroy sensitive soil communities.</p> <p>Changes in soil chemistry. Acidification from conifer crops or importation of roading materials can change soil characteristics making them unsuitable for soil biology in the long term.</p>	<p>Avoid excavation of previously undisturbed soils (ie clearing old ditches is fine, but avoid digging new ones) and time operations to avoid wet seasons.</p> <p>Avoid chemical use; ensure fuel and hydraulic lines are secure; site fuel bowsers with care; have plans and equipment for dealing with spillages.</p> <p>Phase-out pure conifer stands; use locally sourced and inert roading materials.</p>
<p>Old trees & deadwood</p> <p>The main considerations for old trees, deadwood, and the plants and animals that live with them are to take things slowly, and to make provision for future old trees and sources of deadwood.</p>	<p>Abrupt loss of surrounding canopy. From clearfelling or re-coppicing after long-term dereliction. Can lead to instability, scorch or harm to associated plants and wildlife.</p> <p>Overtopping. Blocks the light from old trees resulting in a slow decline. Particularly a problem in PAWS where old trees were underplanted with densely shading conifers.</p> <p>Mechanical damage. Leading to loss of, or damage to, the tree or deadwood. This could be from extraction damage, excessive tree safety work or ‘tidying up’ of deadwood.</p> <p>Root disturbance. From timber extraction; roading in woods or ploughing close to old field trees. Can lead to a slow decline; linked to a cycle of reduced vigour and then disease.</p> <p>Age class distribution. Long-term replacement of old trees and sources of deadwood are often threatened by a lack of ‘new recruits’ in the landscape.</p> <p>Loss of surrounding habitat. Particularly in a wood pasture where open ground habitats have been lost to trees or agricultural improvement.</p>	<p>Phase any major changes to canopy structure over several years. For example, halo-thinning around old trees to stabilise them in advance of heavy operations.</p> <p>Gradually halo-thin around old trees to allow more light in. This can be relatively urgent, to be carried out even where no extraction or further silvicultural operations are planned.</p> <p>Plan timber harvesting and machinery movement to avoid old trees and fallen trunks and limbs. Make tree surgery a last resort; consider moving the risk rather than the tree eg moving a path.</p> <p>Avoid ground disturbance or compaction within an area at least twice the distance from the trunk to the canopy edge.</p> <p>Think of age structure- allow some mature trees to become the ancients of the future. Be aware of the long term need for tree regeneration and in open landscapes consider planting new trees.</p> <p>Be aware that ancient trees may be relicts of wood pasture systems and take advice to manage accordingly. See www.ancient-tree-forum.org.uk</p>
<p>Human traces</p> <p>The principal consideration is that new activities should not obliterate activities that came before.</p>	<p>Mechanical disturbance. Damaging or destroying old features. This may be from timber extraction, new roading or upturning of roots when trees are blown over.</p> <p>‘Sanitisation’. Clearing traces of previous activities, such as conifer planting, because they are now considered unfashionable.</p>	<p>Mark features on a map or with hazard tape as no-go zones for extraction machinery. Take action to stabilise top heavy trees (eg re-cut outgrown pollards or coppice) on especially valuable human traces.</p> <p>Restrict ‘restoration’ activities to the removal of threats to ancient woodland features rather than removing all traces of previous use.</p>

For more specific advice on PAWS, refer to the best practice guidance ‘The conservation and restoration of plantations on ancient woodland sites’. Visit: woodlandtrust.org.uk/publications



Links with external standards, and obtaining grants

Carrying out this simple assessment and recording procedure will help you comply with other management standards and should help you obtain grant aid. For forestry activities this process will help you be compliant with the UK Forestry Standard and support you in the process of gaining certification under the UK Woodland Assurance Standard. The type of information recorded can easily be slotted into woodland grant schemes, for example on the Constraints, Opportunities and Threats form in England and at the Foundation Plan stage in Wales.

This process is also very relevant to other aspects of land management. Agri-environment schemes across the UK require accurate maps of land holdings and their environmental features. In addition, understanding your ancient woodland features will help with choosing and locating options such as buffer strips, in-field tree protection or woodland creation.

With game management, the information gathered through this process can be useful for complying with the 2008 Code of Good Shooting Practice. In a similar way, site-specific information on ancient woodland features will support any management activity or development that requires an Environmental Impact Assessment.



Sources of information

Organisations

- The Ancient Tree Forum www.ancient-tree.forum.org.uk
- Country Land and Business Association www.cla.org.uk
- Farm and Wildlife Advisory Group www.fwag.org.uk
- Forestry Commission www.forestry.gov.uk
- Country conservation agencies:
 Countryside Council for Wales www.CCW.gov.uk;
 Natural England www.naturalengland.org.uk;
 Northern Ireland Environment Agency www.ni-environment.gov.uk;
 Scottish Natural Heritage www.snh.org.uk

Websites

- To view the ancient woodland inventories, old maps and recorded ancient trees www.woodlandtrust.org.uk/en/our-woods/map/Pages/interactive-map.aspx (just switch on the layers you want and zoom in)
- www.old-maps.co.uk to view and buy old maps from different periods of history
- For aerial photos try maps.google.co.uk or www.multimap.com
- Record your ancient trees at AncientTreeHunt.org.uk
- Find out more about the UK Woodland Assurance Standard www.ukwas.org.uk

Publications

- *Managing Ancient & Native Woodland: England Practice guide.* The Forestry Commission
- *The conservation and restoration of plantations on ancient woodland sites.* Woodland Trust. www.woodlandtrust.org.uk/publications
- A series of guides on ancient trees from farming to climate change. Woodland Trust and Ancient Tree Forum. www.woodlandtrust.org.uk/publications
- *Veteran trees: a guide to good management.* Natural England. www.naturalengland.org.uk/publications/publications
- *Woodland heritage manual.* Hallam Environmental consultants. £25 from www.ukconet.co.uk/content/view/53/30/

For further sources of information see our website at www.woodlandtrust.org.uk/awguide