# Ancient and veteran trees:

## An assessment guide

WOODLAND TRUST

# Contents




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# 1. Introduction

***Ancient trees:*** *old in comparison with other trees of the same species*

***Veteran trees:*** *may be of great size or age, or display physical features such as trunk hollowing*

***Thus, all ancient trees are veteran, but not all veteran trees are ancient!***

Ancient and veteran trees are irreplaceable structures that are of exceptional value for nature and people. We love to name and photograph them. We peer into their nooks and crannies and they feature in our histories and our family tales.

Ancient and veteran trees play an important role in maintaining ecological processes and in supporting many species. They underpin the quality of our woodland habitats and, when found as scattered trees outside woods, they are crucial connections across the landscape.

Although the ecological value of ancient and veteran trees is generally well recognised, there is a global decline in the number of such trees[1], including in the UK. Their conservation needs are often overlooked or not understood. Ancient and veteran trees can appear to be stalwarts in the environment – old, resilient or unchanging – but, in fact, they are easily lost.

We want to secure our ancient and veteran trees to celebrate their value and ensure the connectivity and continuity of their habitats.

Across the Woodland Trust's work, this means we:

- **protect** individual and groups of ancient and veteran trees from loss and damage
- **restore** and carefully manage ancient and veteran trees, their populations, and the land around them
- **create** the right conditions for ancient and veteran trees of the future to establish, mature, and grow old.

This guide describes our approach to achieving our vision for ancient and veteran trees. It details how to record them, assess impacts on them, and what you may do to secure their future. Following the steps outlined here may take a few minutes, but could add years or centuries to the life of a tree. We believe this is time well spent!

# 1.1. Scope and outline

This guide describes our approach to conserving any number of veteran trees, wherever they are. It comprises a sequence of steps that you can follow as an adviser, advocate, landowner or manager. It can stand alone or be incorporated into a woodland condition assessment or other site survey. **The information provided concerns prolonging the life and value of ancient and veteran trees and what actions might be required to do so**. It is not a guide to tree inspection or risk assessment.

You should be able to recognise ancient and veteran trees and have a basic understanding of conservation and land management practice. **Training to accompany this guide is available**, as are other introductory courses such as VETree 'Valuing and managing veteran trees'[2].

Ancient and veteran tree management draws on specialist knowledge and skills from a range of disciplines, including ecology, arboriculture and landscape history. In addition to following this guidance, we recommend working in collaboration with accredited specialists who have recognised knowledge and skills in these areas; for example, with VETcert consultants to produce management specifications, and practitioners to undertake any tree work[3].

The following sections are structured around three steps, to record, assess and secure a tree. **We recommend the data collected during these steps is captured in the example form at the end of this guide**.

## *Step 1. Record*

The first step involves collecting basic information about a tree and its features. This section describes how to add trees to our national database – the **Ancient Tree Inventory**[4]. Producing records for individual trees enables a local, regional and national picture of the number and distribution of our ancient and veteran trees.

## *Step 2. Assess*

This section discusses how to assess a tree to determine whether there are impacts or challenges to the continued long life of a tree. **It is as much an assessment of a tree's surroundings as it is about the tree itself.** This step helps you to understand the needs of an individual tree and helps us to understand the state of the ancient and veteran trees and land management issues affecting trees across the country.

## *Step 3. Secure*

After the recording and assessment steps are complete, it is time to consider a course of action to secure a tree. **Ancient and veteran trees require special care, but this does not always mean we must do anything new or differently.** It may be that no action is required at this time. However, it is important to monitor and reflect on recent change – repeat assessments may result in different recommendations. This section does not provide detailed specifications and further reading is referenced throughout.

# 1.2. What are ancient and veteran trees?

Ancient and veteran trees are some of our most special trees. To recognise them, look out for **features** that make them great homes for wildlife, and for clues to a **great age, such as large size**. However, don't forget those smaller trees – some of the very oldest are found in harsh environments like cliff edges and mountain sides, and never grow large. Small-statured species and multi-stemmed trees are also easily overlooked.

The terms 'ancient' and 'veteran' are sometimes used interchangeably, but we also make a distinction between them. Not all veteran trees are ancient, but all ancient trees are also veteran trees, so sometimes we use 'veteran trees' to refer to them both.

**A veteran is a mature tree that has developed valuable decaying wood features**, not necessarily as a consequence of time, but due to its life or environment. Veteran trees may not be very old, but share similarities with ancient trees, such as trunk or branch hollowing, or significant amounts of other decaying wood.

**An ancient tree is one that has passed beyond maturity into an ancient life stage, or is old in comparison with other trees of the same species**. The typical lifespans of trees differ according to species; for example, birches tend to live shorter lives than oaks. As a result, the age at which different species reach ancientness can also vary by a few hundred years.

Ancient and veteran trees can be found in every corner of the UK. Their distribution is diverse, existing in both large collections and as scattered individual trees across a variety of land uses. This is because many old trees began their lives in settings very different to those of today, often pre-dating roads, buildings and the modern-day activities around them.

Tessa Chan/WTML

Ancient trees can be identified by their 'old', knotty and gnarled appearance. Like the Crouch Oak in Addlestone, they stand out in their environment and relative to other trees. They generally have a short stature, a small crown, and a very wide trunk.

# 1.3. Why are ancient and veteran trees important?

## *For nature*

Ancient and veteran trees are disproportionately valuable parts of the natural environment[5]. They are keystone structures, containing unique microhabitats for specialist wildlife[6], and are host to hundreds of species at any one time. For this reason, they are vital attributes of woodland sites and open wooded habitats. Trees outside of woods, i.e. scattered and hedgerow trees, are also particularly important for landscape connectivity[7].

Where trees have persisted for a long time, so too has the soil around and beneath them. This soil reserve, and community of life within, is therefore also old and is precious. Much is still to be discovered about the ground below ancient and veteran trees, but research has shown that it holds unique communities, including that of mycorrhizal fungi[8] – the fungi that make up the 'wood-wide web' – which trade nutrients in exchange for sugar made by the trees through photosynthesis.

Decaying wood, such as that within trunks and branches, is a key feature of ancient and veteran trees rather than a sure sign of ill health. The properties of decaying wood are determined by the presence of some fungi, the stage of the decay process, and its location within a tree. Decaying wood can range from stringy or spongy to crumbly or flaky in texture, because different fungi break down components of wood in different ways. In turn, this influences the species that they support.

The organisms that use decaying wood during their lives are called saproxylic organisms[9]. They include animals and plants, fungi and other microbes that use it as habitat for breeding or larval development, or as food – the wood components, fungal mycelia or animal prey. Owing to the uniqueness and rarity of some of these resources, many species of conservation concern are associated with ancient and veteran trees[10].

Luke Allwright

Several heart rot fungi, including scalycap mushroom as pictured, may be involved in the hollowing process. Some tend to associate with particular tree species.

Laurie Campbell

Decay fungi produce fruiting bodies, such as mushrooms and brackets, providing food and habitat for animals. Here, this common woodlouse is grazing on a jelly ear mushroom.

Many animals will shelter, nest or roost in the various cavities and hollows of ancient and veteran trees, while water-filled holes are used for drinking and bathing by a range of amphibians, birds and mammals[11]. In Europe, an estimated 30% of forest-dwelling birds use tree cavities[12], and the availability of these cavities – in number and type – can limit the size of some bird populations[13].

A rich array of invertebrates are associated with veteran trees. Over 2,000 species are known in Britain[14], including groups like spiders, slugs and woodlice, and insects such as flies, moths and beetles. Many are at risk or in decline; for example, 18% of European saproxylic beetle species are estimated as threatened[15].

Steven Falk

The larvae of the noble chafer (*Gnorimus nobilis*) develop in the decaying wood and wood mould within the hollowing trunks of veteran fruit trees, especially plum, cherry and apple.

John Bridges/WTML

Woodpeckers play a role in both using tree hollows and in producing (excavating) holes in trees with decay. Later, other birds can make use of these holes.

Ancient and veteran trees are also home to many epiphytes – species that grow on plants – and can host a diverse and luxuriant growth of bryophytes (mosses and liverworts). Some specialist mosses live in the periodically wet spots below the opening of rot holes. Ferns, and vascular plants, including trees, can establish in damper and decay-softened pockets throughout the trunk and crown.

A single tree can provide a wide variety of different substrata, some of which uniquely develop as the tree ages[16]. Here, distinct communities of lichen grow on dry, exposed heartwood, while others grow on bark that has changed in texture and chemistry over time. Due to their specific requirements, many of these lichens are rare. These specialist species also take a long time to grow and disperse to new places, so their presence can indicate good quality sites with a long continuity of suitable habitat, such as ancient woodland[17].

Alastair Hotchkiss

*Cresponea premnea* is a lichen characteristic of bark of very old trees in drier areas.

Des Callaghan

The Knothole Yoke-moss (*Codonoblepharon forsteri*) is an endangered moss that occurs on beech pollards at only a few sites in southern England. It is found near to water-filled holes on trunks and especially knotholes of roots.

## *For people*

Ancient and veteran trees are of great significance to people and have cultural, heritage and aesthetic value[18]. Some are iconic specimens that are of national interest, while others provide local character and a sense of place. **People feel a deep kinship with ancient and veteran trees – seeing them as old friends and a connection to stages or events in their lives.**

A long history of trees and people has, in part, helped to give rise to many of our ancient trees. Cultural tree-management practices such as pollarding and coppicing[19] involve repeated cutting and harvesting of wood used for various products. The value of these 'working' trees and their regular management has contributed to their protection and prolonged lifespan.

The ancient and veteran trees of today continue to provide people and society with important services[20]. They stabilise soil, capture and store carbon[21] and boost ecosystem functions, including plant pollination[22].

Steven Falk

The bumblefly (*Pocota personata*) is a hoverfly that mimics a bumblebee. It is one of 350 species of flower-visiting insects that begin their life in decaying wood.

Tessa Chan/WTML

An old photograph of a loved tree – the Remedy Oak.

# 2. Recording, assessing and securing trees

## 2.1. Step 1. Record

The first step is to create a record of a tree with some basic information about it. Ideally, this record should be submitted to our **Ancient Tree Inventory (ATI)**, where there is further guidance on how to do so. Most of the information in this recording step need only be captured once, though it is useful to update some fields over time; for example, the girth and photos.

You will need:

- a soft tape measure
- camera
- notebook or recording form
- mobile, tablet or GPS device
- map (Ordnance Survey, satellite and historic maps are viewable on the ATI website)
- tree or fungus identification guide.

The minimum information you will need to gather includes:

- **Species** (e.g. '*Betula pubescens*', 'birch', or 'unknown')
- **Tree form** (the shape of a tree, indicative of its management, e.g. 'maiden', 'pollard', 'coppice')
- **Tree status** (e.g. standing or fallen, dead or alive)
- **Girth** (the measured distance around the trunk and the height of this measurement from ground level)
- **Location** (e.g. eight or 10-figure grid reference, precise to within a maximum of 10 metres)
- **Access** (viewable from public right of way, or private and not viewable without permitted access)
- **Characteristic features** (e.g. decaying trunks and branches, hollows and cavities)
- **Photographs** (e.g. the surroundings of the tree and its features, such as trunk hollowing and other deadwood).



| **An example: The Tolpuddle Martyrs' Tree** |
|---|
| Species: **Common sycamore *(Acer pseudoplatanus)*** |
| Form: **Pollard** |
| Standing or fallen: **Standing** |
| Living status: **Alive** |
| Girth: **5.90m at a height of 1.50m** |
| Grid reference: **SY7917094470** |
| Public accessibility: **Public – open access** |
| Decay features: **Holes or water pockets, hollowing trunk – with holes > 15cm** |

## 2.2. Step 2. Assess

The aim of this step is to identify impacts and come to an opinion on whether a tree is threatened, and if so, to what extent. As a starting point, you should first consider the setting in which a tree is found. After this, your assessment should proceed by paying attention to the roots and soil, the trunk and crown, and the whole tree in its surroundings. You should note impacts, their causes and some measure of their severity (if relevant). Your findings can be entered into a survey form – see example at the end of the guide. After assessing the overall threat to a tree, monitoring is required to identify new impacts and keep track of whether that threat is increasing or decreasing.

### *2.2.1. Understanding the setting*

Before starting an assessment at a tree, some preliminary work can help you to understand the setting and can provide useful context. However, **trees should not be presumed secure** based on this initial gathering of evidence about the site designation, land ownership, or management regime. Land is managed for various purposes, and any ancient and veteran trees may be neither identified nor actively conserved.

A first exercise can be desk-based, to investigate if the land is protected in some way; for example, is designated as a Site of Special Scientific Interest (SSSI), is mapped as important habitat, or is on other inventories, including the Ancient Woodland Inventory (AWI). Historic maps can help you understand the land's past and are readily accessible online[23]. You should also consult the Ancient Tree Inventory to check if a tree is already recorded, and whether there are others in the vicinity.

Seek a discussion with the owner or manager of the tree. They may be able to share information about the management of the tree and its surroundings, as well as the history, stories and views on its significance. Some of this information may not be gleaned from a visit without a discussion, which could later help inform any advice notes, reports or plans. On site, the most common impacts you observe can depend on the surrounding habitat or type of land use[24]. For example, a veteran tree on an arable farm might be impacted differently to one in a commercial forestry setting.

#### *Woodland*

Ancient and veteran trees may be found in woodland with quite different management histories. The species and form of trees can reflect geographic differences between woods and a diversity of past or present uses. For example, in some woods, the oldest trees may be ancient stools that were once managed as coppice. Historically, our woods and wooded pastures had a more varied and open structure. Some woods of today now have denser tree cover due to loss of


**Consider and make notes on:**

1. Do veteran trees have adequate light and space?
2. Are future veterans identified and managed well?
3. What recreational activities take place and where?

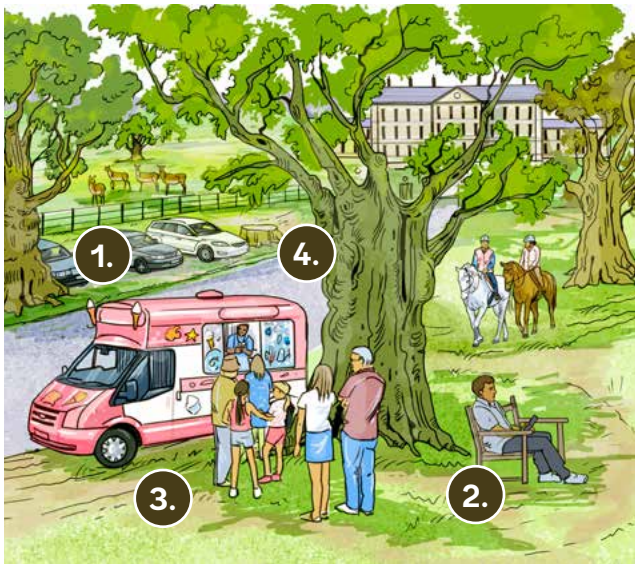
grazing animals, a decline in mixed land use, or abandonment of pasturing and wood harvesting. As a result, very large and hollow trees and their associated biodiversity are relicts of past conditions[25]. Ancient and veteran trees may still be found in ancient woodland that has been cleared and/or replanted, often with introduced tree species (Plantations on Ancient Woodland Sites/PAWS). Here, they are remnant features, and priorities for action in the 'first aid' phase of restoration management[26].

It is currently estimated that 97% of woods in the UK have too few veteran trees and a density that is 'unfavourable[27]'. Woodland owners and managers should be aware of existing guidance within the UK Forestry Standard (UKFS)[28] which states that veteran trees should be protected from loss or harm, and future veterans should be identified and managed. Other woodland certification standards, such as the UK Woodland Assurance Standard (UKWAS)[29], also include requirements to maintain continuity of veteran tree habitat.

## *Historic, designed and other environments*

Today, many ancient and veteran trees are found in historic parks and gardens and other amenity spaces. Existing trees were often incorporated into the design of historic parks and gardens, while plantings, such as those in avenues, are now also large collections of trees that are hundreds of years old. In these settings, trees are more often able to build a large, spreading crown and have had space to 'grow downwards' as they age. For this reason, very old, open grown trees have persisted and are reliably found in wood pastures and designed parkland landscapes where tree density has remained lower than in woodland managed for other objectives.

Sometimes, landscape design and public access can be in conflict with ancient and veteran trees. For example, trees in high use areas may be removed or cut in order to manage risk, while a desire to maintain a tidy look can result in the removal of dead trees and deadwood from around ancient and veteran trees.

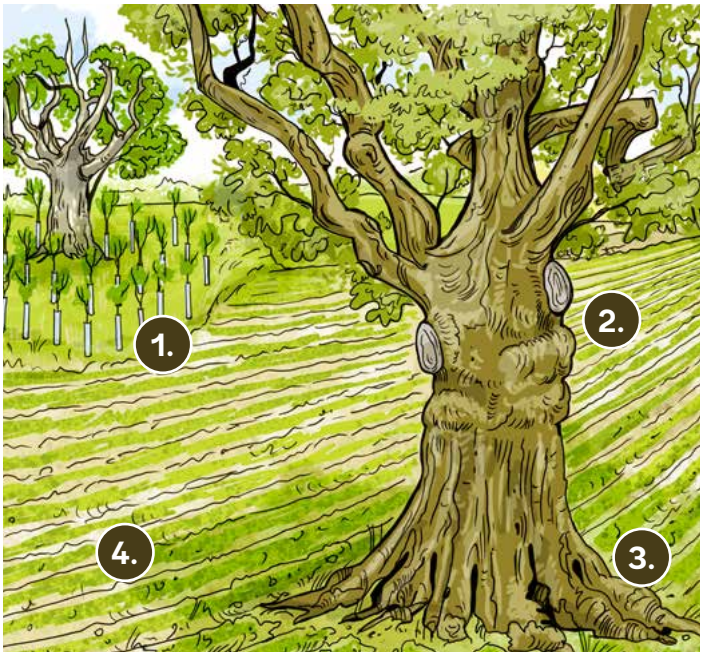



**Consider and make notes on:**

1. Where can vehicles park?
2. Is visitor infrastructure located near to veteran trees?
3. Are seasonal events planned and managed sensitively?
4. Is deadwood valued and managed well?

## *Farmed environments*

Ancient and veteran trees are found across farmland, within hedgerows, in fields and pastures, or around farm buildings. Some farm systems, such as traditional orchards, can be hotspots of ancient and veteran trees and their special biodiversity. As farming practices are so various, so too are the impacts on trees in these settings[30]. Some impacts to veteran trees may be limited by following existing regulatory requirements, and you should be aware of the national or regional differences in these requirements. However, best practice care may go beyond minimum standards. There may be funding or incentives to care for trees on farms.

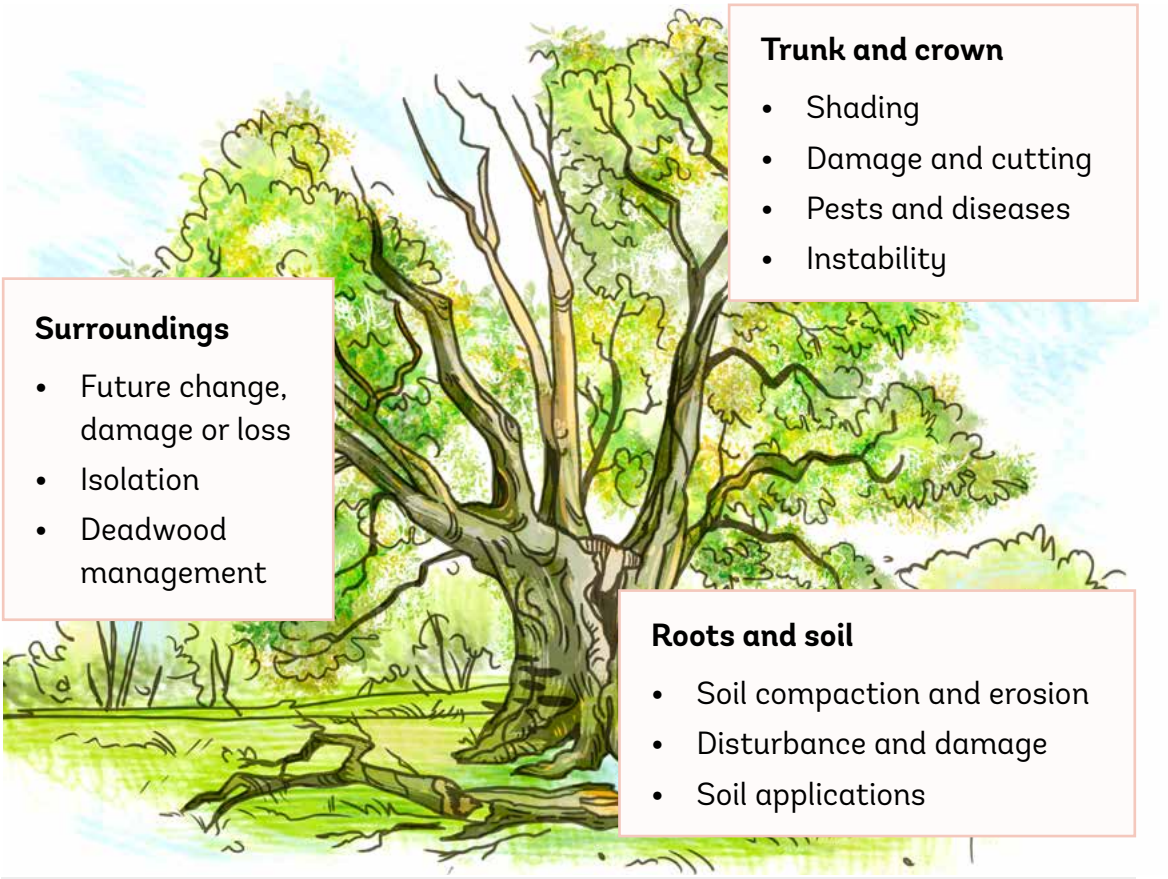



**Consider and make notes on:**

1. Is new tree planting away from existing veteran trees?
2. Is there evidence of inappropriate cutting?
3. Where is the ground cultivated?
4. Are pesticides or fertilisers applied nearby?

## 2.2.2. Completing an assessment

To complete an assessment, you should look at different parts of the tree in turn, which helps to ensure impacts are not overlooked. Start with the below-ground portion of the tree (roots and soil), followed by the above-ground portion (trunk and crown). Finally, you should consider the whole tree in its immediate surroundings. The most common impacts are discussed in this section, though you may encounter others particular to individual trees and sites.




Consider, in turn, impacts to the different parts of the tree and its surroundings.

### 2.2.2.1. Roots and soil

Roots are responsible for water and nutrient uptake, storage and transport, and they provide anchorage that is crucial to a tree's stability. As with most trees, the roots of ancient and veteran trees can extend further than is often appreciated – tens of metres beyond the trunk and outer extent of their crown. They are also found much closer to the soil surface than is often presumed. Roots can be irregularly distributed around the trunk and are sectorial, with particular portions of the root system having greater importance for individual parts of a tree's crown. Woody roots, like the above-ground parts of trees, can be long-lived. They may be particularly sensitive and less able to respond to changes in soil conditions and hydrology[31].

The surrounding soil is also crucial to tree and root health. Soil and roots are intimately linked together by soil organisms and mycorrhizal fungi, which extend the rooting network and provide resources and protection to the tree. Several factors, such as soil compaction, erosion and contamination, may adversely affect the roots and cause soil degradation. These alter soil chemistry and biology – directly impacting roots and their symbionts – and reduce the ability for roots to explore soil, respire and take up water and nutrients. These stressors predispose trees to diseases and decline, and are linked to the functioning of mycorrhizas[32].

Due to their hidden nature, tree roots and their soil environment are easily overlooked and underappreciated. **Because we cannot easily see where roots are, we must assess the impacts on an adequate amount of ground around the tree**.

### *Root protection areas*

A root protection area (or zone) is an imagined or demarcated space of ground within which a tree stands. It is intended to contain enough roots and rooting volume to sustain it.

A root protection area can be usefully applied by anyone who owns or manages trees, though they are more commonly used in construction or development scenarios. In these scenarios, a minimum standard[33] is applied to all retained trees.

A root protection area for ancient and veteran trees should be as large as possible. As a minimum, it should be whichever is greater of:

- an area with a radius that is 15 times the diameter of the tree (measured at 1.5m above ground-level)
- an area extending five metres beyond the outer edge of the crown.

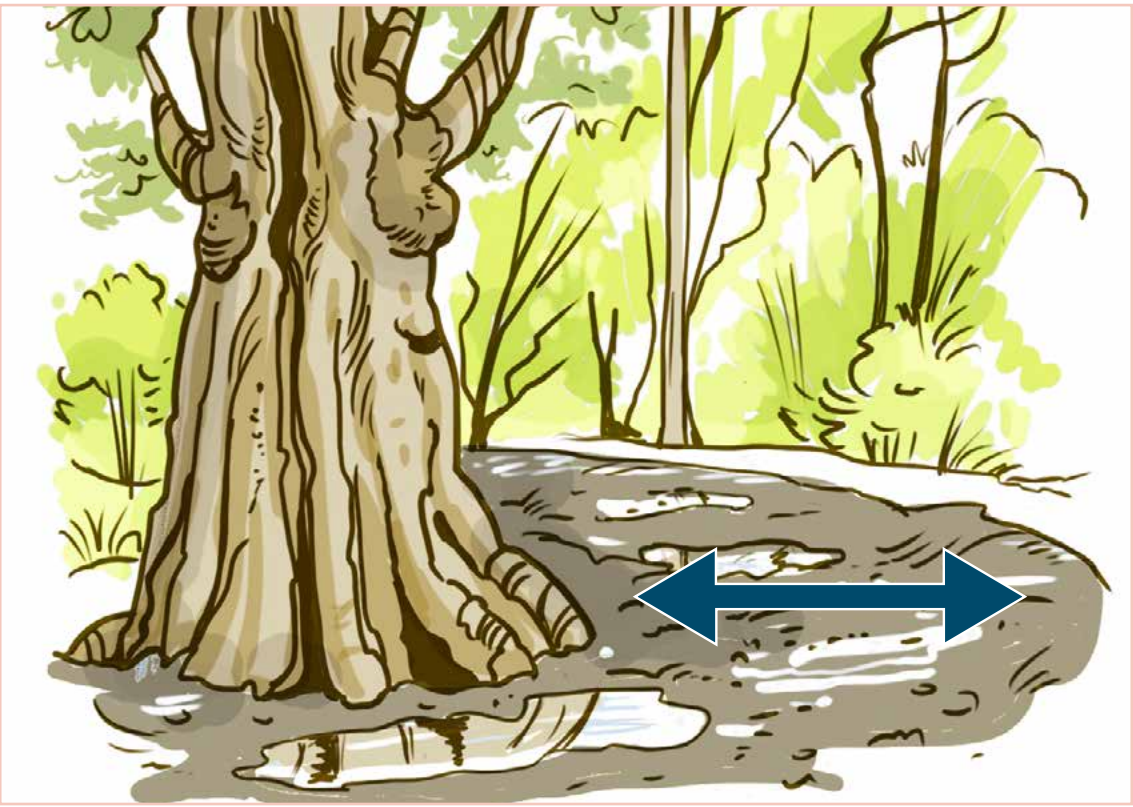
From above the ground, the extent of the root system is not apparent, but below ground the roots extend way beyond the trunk of the tree, hence the need for a root protection area.

## *Common impacts and assessing them:*

### *Soil compaction and erosion*

Ground compaction means the loss of air spaces between soil particles. This increases the density of soil and reduces the movement of air and water through it. Compacted soils can prevent root growth, change the soil microbiome[34] and create low oxygen conditions which are not conducive to normal root function. Indirect effects of soil compaction, such as waterlogging, can cause death of ancient trees[35]. Erosion is the loss of soil from around and under trees. This is another form of soil degradation that can also result from the same causes of soil compaction.

Vehicles are a major cause of soil compaction[36]. Studies show that even first passes of a heavy vehicle can do damage[37], with subsequent passes causing relatively less. Even fairly low-impact 'natural' events, such as the activity of people and animals, can cause soil compaction. Recovery of soil structure can occur with the help of soil animals and microorganisms, but soil compaction can also be very long lasting, with key organisms such as earthworms sometimes showing slow recovery[38]. It is also difficult and expensive to try to remedy.



**You should note the causes of soil compaction and relevant indicators of it.** These can vary, as soil compaction can be indicated by large areas of bare ground, by water pooling and by the presence of plants indicative of highly disturbed ground. You should add if these indicators are localised or extensive within the root protection area. Direct measurements of soil properties can be made, if necessary[39].

## *Disturbance and damage*

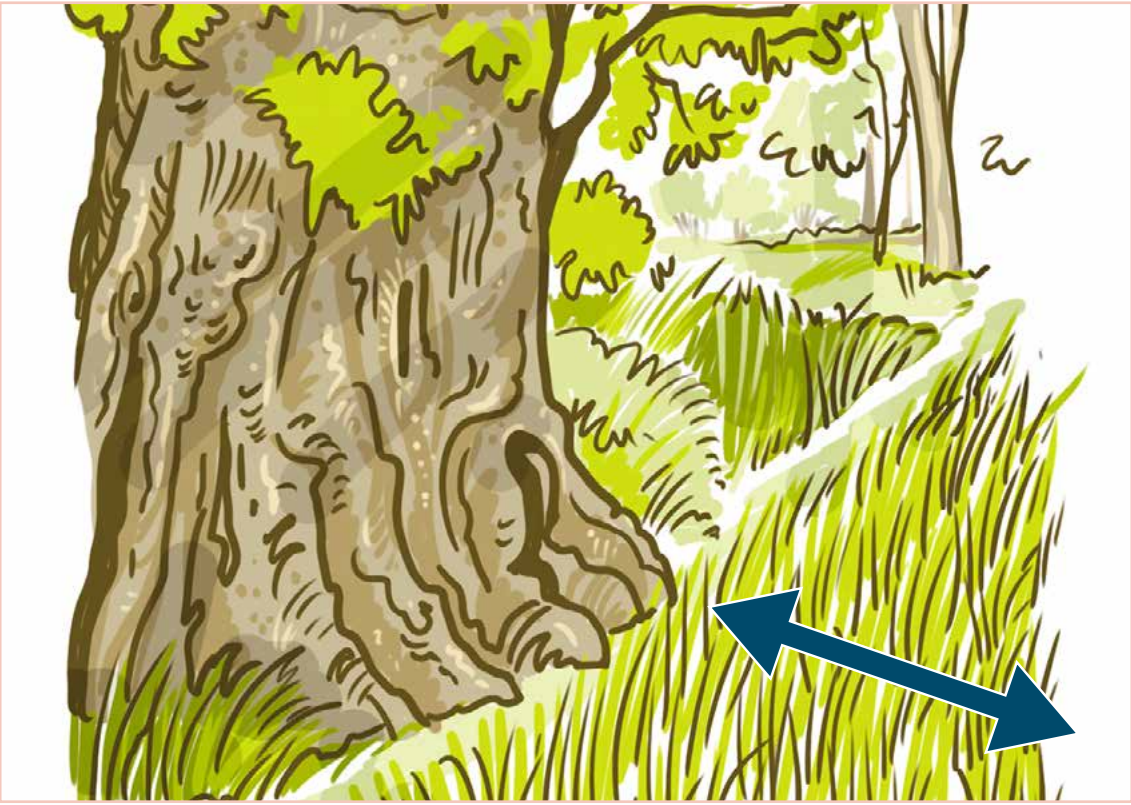
Soil disturbance and damage to roots, particularly of woody roots, may impact a tree in several ways. Where vascular connections are damaged, the functions of water and mineral uptake and of sugar transport are disrupted. Woody roots also store starch reserves which, if lost, can cause decline or death[40]. This loss also removes the parts from which new and fine roots can grow and regrow. Damage also creates conditions that can increase the rate of decay in woody roots, the loss of which, close to the trunk, can cause instability in a tree.

Localised digging can sever woody roots that support large parts of the tree and its crown. Larger soil disturbances close to veteran trees, such as ploughing, can destroy soil structure, finer roots and mycorrhizal networks[41].

**You should note the cause of soil disturbance and root damage and the proximity of this to the tree**. For example, is there evidence of this happening close to the trunk, up to the edge of the crown, or further away but still within the root protection area?

## *Soil applications*

Soil inputs or applications are added to the ground around trees for various purposes, such as to control weeds or enhance fertility. These can cause direct impact on roots and other soil organisms. Pesticides and animal medicines can be toxic to soil organisms that are crucial for soil functioning[42]. Inorganic and organic fertilisers can cause changes in soil chemistry and pH, or nutrient enrichment that disrupts symbiotic relationships between trees and mycorrhizal fungi[43].



**You should note the type of soil inputs and how near to the tree they are applied**. For example, is there evidence of applications close to the trunk, up to the edge of the crown, or further away, but within the root protection area?

### 2.2.2.2. Trunk and crown

A tree's crown is its powerhouse, where sunlight is harnessed by leaves to produce energy. It is supported by the stem, or trunk, which is the vital, continuous vascular connection from the roots to the leaves. The outer trunk is covered by bark, which protects a relatively thin band of active tissue layers beneath it. Here, these tissues transport water, minerals, sugars and other compounds around the tree. They divide and grow, such that the trunk increases in girth each year. This is most visible as incremental growth rings of wood or xylem.

With time, the oldest wood in the central parts of the trunk and branches cease to conduct water, and the cells in these parts die. At this point, it can no longer be called sapwood and is instead called heartwood. Heartwood contains no living cells and any structural support it provides also reduces with age. The hollowing seen in ancient and veteran trees is due to the decay of heartwood and is not a cause of concern for the tree.

Emma Gilmartin/WTML

Hollowing in beech trees caused by the *Ganoderma* fungus, pictured. Within the hollow, the trees' adventitious roots grow down to access the nutrients released by decay.

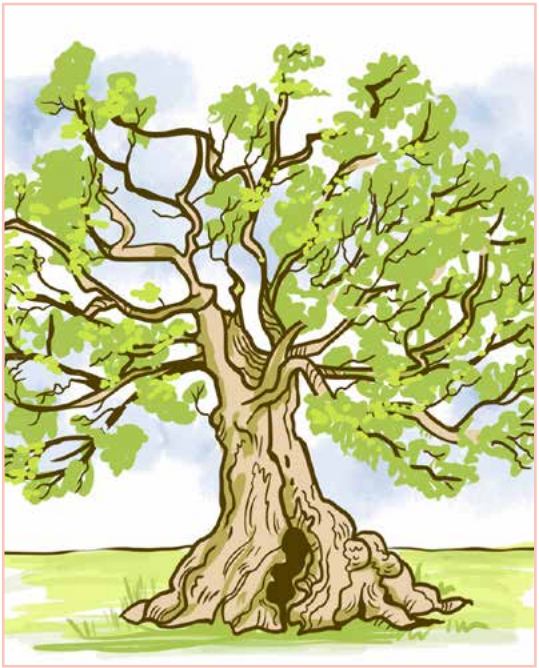
### Why do trees decay and become hollow?

Decay and hollowing, or heart rot, is a natural part of the life of a tree and is vital to the ageing process. As trees produce new wood each year, the oldest wood in the central trunk eventually becomes inactive and redundant.

Decay begins when a tree is alive and standing and continues for years, often centuries, before it dies or falls to the ground[44]. The tree begins to hollow; sometimes first at the base of the trunk, or higher in the trunk and in large branches. Eventually, these hollows and smaller cavities can merge to become extensive throughout the tree.

A rich succession of species are involved in the decay process. Many of these are specialist fungi whose fine thread-like tubes, called mycelium, spread through wood and secrete enzymes that break down different components in its structure. Other organisms that play a role include bacteria, other microbes, and invertebrate animals. Invertebrates may directly consume and digest wood, but they also tunnel through decaying wood, breaking it into smaller, finer fragments[45]. This gives rise to a dynamic, ever-changing habitat and resource for other wildlife. The nutrients released by decay are also recycled by the still-growing tree itself, which can lay down new, adventitious roots to access them.

Ancient and veteran trees have certain characteristics that are relevant to their care. One of these is crown retrenchment – the process of reorganising the tree's crown in response to physiological stressors that come with age, size and complexity[46], as well as a response to changes to its environment. The retrenched crown of an ancient tree is typically smaller and closer to the ground than it was when it first reached maturity. This means that it can be vulnerable to shading and competition from nearby trees and shrubs. It is important not to confuse retrenchment with other crown dieback resulting from impacts that you may identify during your assessment. As an indicator of tree health, **you may wish to note the condition of the crown by estimating its transparency[47] (how much light passes through the crown). This can indicate a tree under stress and needing further attention**. Expert assessors should also assess vitality[48].



A further feature of ancient trees is the development of parts of the roots, trunk and crown into functional units. A new ring of sapwood produced each year must serve an ever-increasing stem girth. Eventually, the energy required to produce new wood around the whole stem cannot be sustained by the crown, and you may notice the stem circumference has become fragmented into individual sectors. As these may function more or less independently as separate trees – comprising roots, stem and leaves – **it may be appropriate to assess impacts on individual functional units[49]**.

## *Common impacts and assessing them:*

### *Shading*

Tree species do differ in their ecological requirements for light, such as for germination and establishment, and in their ability to tolerate some shade[50]. However, all trees need light, especially trees in, or entering, the ancient stage of life. In part, this is due to a tree reducing in size as it ages. When the land use around a tree changes, and in woodland that has little intervention, the old tree may become shaded by younger, faster growing trees, as well as large, evergreen shrubs such as laurel and rhododendron. As for ancient trees generally, the crowns of pollarded trees are also vulnerable to shading by other trees and shrubs.

The presence of ivy is often seen as a problem for trees, but it is important to note that ivy does not kill trees and should be welcomed as an important resource for wildlife, a late nectar source for pollinators[51], and as roosting sites. Sometimes, shading caused by ivy may impact new, essential growth from the trunk and lower crown, which is especially important as crowns undergo retrenchment. Unchecked growth of ivy can also shade epiphytes, especially in woods without herbivore grazing[52].

**You should note the causes of shading; for example, young trees, broadleaved or evergreen trees, shrubs or climbers, and the extent of current shading on a scale from light to extensive shade**[53].

For those involved in tree safety management, there is often concern that ivy needs to be managed. This can typically be for one of two reasons:

i. Ivy is masking features. The duty of care placed on tree owners does not require the removal of all risk, rather that the tree owner takes reasonable care to prevent reasonably foreseeable harm[54]. The widespread removal of ivy 'just in case' it may be masking a feature, would not be reasonable. In contrast, the removal of ivy after a visual inspection suggests the tree's structural or physiological condition may be compromised would be reasonable.

ii. Ivy on dead or dying trees. On such trees, ivy has the potential to increase wind load faster than the tree can adapt. In such cases, this ivy may lead to the failure of part or all of the tree.

## *Damage and cutting*

Trees have several strategies to cope with the pressures of grazing animals, as they have co-evolved over millions of years. Appropriate grazing levels are crucial to ancient and veteran tree care; grazing pressures that are too high or too low can each have negative consequences. Animals do, of course, browse on the bark and leaves of trees, particularly at certain times of the year, and the trees also serve as rubbing posts.

Sometimes, ancient and veteran trees are pruned or cut. This can happen where there is a perceived need to reduce the size or alter the shape of the tree's crown, or to facilitate access or height clearance for vehicles or large machinery. Other forms of damage caused by humans can range from vandalism through to setting of fires in or near to ancient and veteran trees.

Injuries to the trunk and crown by animals and people can disrupt the flow of water and nutrients and the ability of the tree to photosynthesise.

**You should note the cause of recent damage and its extent around the trunk circumference**, if appropriate; for example, <⅓ of the trunk diameter, ⅓–⅔ or >⅔ of the trunk diameter. Remember that it might be more appropriate to consider the damage to each identified functional unit. **You should also note any evidence of recent pruning and major tree surgery (within the last few years).**

## *Pests and diseases*

Some pests or diseases are a part of life, albeit acting as additional stressors to trees. Others, such as ash dieback, can pose a threat to tree populations across entire landscapes. Trees form part of complex, dynamic ecosystems which are maintained by various checks and balances. Yet continued disruption of ecosystems – for example, from climate change – is likely to increase the threats to trees from pests and diseases, and new and introduced pests and diseases are expected to evolve or arrive in the country with increased frequency. As with all trees, veteran trees can be threatened by pests and diseases, and you should seek up-to-date information and advice on new and introduced organisms.

**You should note any pests or diseases**, though this might not require any further action. An important exception is **notifiable pests and diseases that must be reported to the relevant authorities** – TreeAlert[55] or TreeCheck[56] in NI – and which might require quarantine. Await formal identification and further advice before making hasty decisions that might include cutting or removing ancient and veteran trees.

## *Instability*

Ancient and veteran trees can be complex structures; a result of a long life shaped by the elements and a myriad of human influences. At times, trees may become unstable, meaning that parts of their structure are at risk of serious breakage or collapse – called partial or full failures. These failures can result in the complete loss of a tree or an unacceptable reduction of its wildlife or heritage value.

When part of a veteran tree fails, this failure may weaken the tree's structure or expose the crown to altered influence of winds. This can lead to an increased probability of further failure. Many trees were once worked for fodder or as pollards, and when cut on a regular basis, their crowns were kept small. Where pollarding regimes have lapsed, regrowth on top of hollowing stems can become large and heavy. These lapsed pollards can be at risk of failure and present a complex management challenge.

**You should note any recent major tree surgery, recent failures, or signs for concern in lapsed pollards. These should be followed up by a qualified professional.** Assessment of the biomechanical structure of ancient and veteran trees is a specialist subject and should be undertaken by someone with knowledge and experience in this area.

### 2.2.2.3. Surroundings

When conditions around old trees change rapidly, there can be cause for concern. Multiple stressors and impacts – even when each is perceived to be small – can combine to pose significant threat[57].

**An assessment of impacts should include proposed or recently observed changes to the surroundings of a tree and of the quality and succession of habitats provided there.**

## Common impacts and assessing them:

### Isolation

The special wildlife of ancient and veteran trees need habitats that are both well connected to others and in continuous supply. When this is lacking, trees can be thought of as isolated in time and in space.

At sites with historic pauses in tree establishment, there may be a 'generation gap' that threatens to break the continuity of habitats provided by veteran trees. **The time required for younger trees to develop veteran features can range from a few decades to a few hundred years**. In the meantime, existing veteran trees may die or fall, or a specific microhabitat may be lost – decaying wood, by its nature, constantly changes, albeit at varied rates. Species present in veteran trees may die out where there are no new habitats coming into condition at the right time. This is called an extinction debt and is an important consideration in conservation.

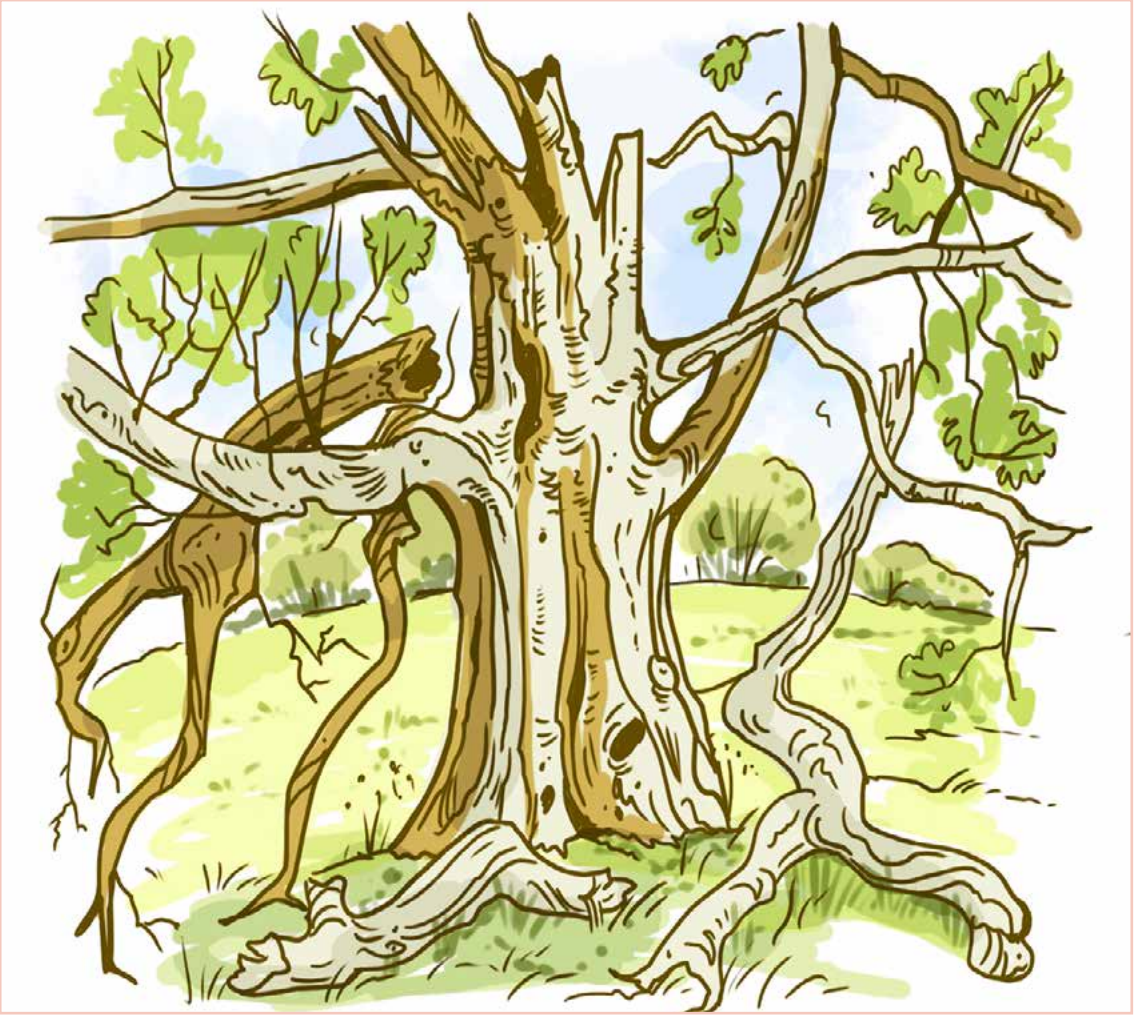
Veteran trees that have no others nearby may be also considered isolated in space. Species populations cannot survive indefinitely in one tree; habitats change over time and veteran trees are lost each year. If a species present in a veteran tree cannot reach another veteran, it may eventually die out. This small-scale isolation can mean that species diversity is lower in isolated veteran trees compared with those that are close to others[58]. The ability of different species to disperse is not fully known, making it difficult to provide precise guidance on suitable distances between trees.

A practical assessment should **look for other veteran trees within 100 metres**, which is equivalent to an approximate density of two veteran trees per hectare. **You should also note if there are potential successor trees – mature and obvious future veteran trees – within this distance**.

## *Deadwood management*

One of the most important biodiversity values of ancient and veteran trees is provided by the range of deadwood microhabitats they contain. For example, sun-baked dead branches high in the crown are unique habitats that host distinct species communities. And yet, in some settings, this deadwood is routinely 'cleaned' out of tree crowns.

When deadwood falls or is placed on the ground, the particular conditions it provides will change rapidly. As such, its removal from the crown (even if not taken away) could be considered a loss of habitat. However, some species can continue to live in fallen deadwood, particularly in large limbs where properties may change more gradually than in smaller-diameter wood. Deadwood lying on the ground is sometimes dutifully tidied away or harvested; for example, for firewood.



**You should note the removal of deadwood from tree crowns and whether deadwood cut or fallen from ancient and veteran trees is left alone.**

## *Future change, damage or loss*

The impacts on ancient and veteran trees due to a change of land management can be various; any of those outlined earlier could begin to pose a new threat to trees. For example, soil may be affected by changes to grazing practices, by construction activities such as storage, tracking, and ditching for new service installation. This can have an impact on hydrology, aeration and nutrient cycling. If significant, changes in the soil environment can have serious implications for tree health as water and nutrient uptake are affected.

Trees that started life in an open environment may suffer when changes in land use or management results in a change in light levels around the tree. This typically happens when grazing pressure is reduced or removed entirely, allowing young trees to grow up around old ones. Woodland creation activities can also pose a threat to ancient and veteran trees. Even small amounts of well-intentioned planting can put new trees too close to existing trees and will eventually cause shading or crown competition that shortens the older trees' lives. **This scenario is more likely when ancient and veteran trees have not been recognised as important conservation features.**


**You should consider what recent changes have occurred around the tree and details of new, proposed changes.**

## 2.2.3. Determining threat

To enable appropriate recommendations and prioritisation, it is first necessary to determine the overall level of threat. **Trees can be identified as critical, threatened or secure**.

Critical trees include those in deep shade, trees with ongoing damage to large portions of their trunk circumference, and those under imminent threat of further damage, felling or removal. **Critical threats should be addressed as soon as possible and certainly within one to two years**.

Threatened trees are those with one or more identified impacts that have the potential to increase in significance and, as such, should be addressed within the next five years.

Secure trees have no current identified impacts and are unlikely to require interventions within the next five years.

You should include your reasoning for the determined threat level. There is always an element of subjectivity here, so recording your thought process can be very helpful. Relevant considerations include the type of impacts identified and how close these are to the tree. Do they occur directly at the tree, close by or further away? Impacts may be chronic, periodic, or related to seasonal activities. Are impacts likely to decrease or increase in magnitude?

## 2.2.4. Monitoring and repeat assessments

Monitoring is the process of tracking change or progress. As a threat assessment represents only a snapshot in time, it will be necessary to repeat it at regular intervals. If a tree is deemed secure, repeat assessments could be planned on a five-yearly basis, or fitted into a management planning cycle. **Depending on the impacts identified and the recommendations made in 'Step 3', it might be necessary to revisit and reassess the tree sooner**.

## 2.3. Step 3. Secure

This step involves acting or advocating for best practice care of ancient and veteran trees. It can involve a conversation with the landowner or manager and the production of an individual tree management plan, and may require the advice of a specialist.

If a tree has been identified as threatened during 'Step 2', actions to alleviate impacts can be suggested from a list of standard recommendations, outlined in the following sections. These can be inserted into a site management plan or an individual tree management plan, together with priority ratings (high/medium/low) that are informed by the overall threat status. **A sense check of your assessment and recommendations with other peers can lead to the best outcomes for ancient and veteran trees**.

### *2.3.1. Making recommendations*

Each tree is an individual and should be treated as such. Don't be tempted to make recommendations without fully assessing a tree. Your recommendations **should aim to avoid initial harm, prevent further damage and reduce the impact of ongoing activities**. In many cases, the focus will be on managing the land around the tree, rather than the tree itself[59].

In order to make your recommendations, consideration should be given to how significant a threat is; it may be that an identified impact is minimal and decreasing. **Active management of ancient and veteran trees can include doing nothing for now, while continuing to monitor over time**.

Your assessment may have highlighted a wider issue that is affecting a number of veteran trees and your recommendations may seek to alleviate impacts on more than one tree or address more than one identified impact; for example, redirecting access routes may reduce compaction and risk of vandalism. **The opportunities to maximise environmental gain should be prioritised and planned at a site or compartment level**.

**You may need to procure the services of a specialist consultant and/or contractor. Ideally, they will be VETcert certified**, or at the very least will have up-to-date knowledge of relevant legislation, tree care standards and protected species. Further, they should be able to explain why ancient and veteran trees require special consideration and management approaches. Organisations such as the Ancient Tree Forum and the Arboricultural Association provide further guidance on how to find the right professional.

Some standard recommendations are outlined below, while any other proposed management should be tested against our guiding principles.
Will they:

- Allow the tree adequate space and opportunity to continue growing old
- value decaying wood habitats?
- look to the future?

## 2.3.1.1. Allow the tree adequate space and opportunity to continue growing old

**Ancient and veteran trees should be given adequate space:** they need enough light and room for the trunk and crown and ample below-ground rooting and soil volume. **They should have the opportunity to continue growing old, left alone where possible, in favourable surroundings where their survival strategies can play out in 'tree time'.**

Emma Gilmartin

Allow trees to continue growing old. Trees have evolved many long-term survival strategies and can often regrow or reroot, e.g. after falling over

### Avoid impact

It is best to adopt an approach that prevents harm to the tree in the first place.

- Identify and record ancient and veteran trees as conservation features so they can be accounted for during any land-use planning.
- Do not create new facilities, routes and other infrastructure near to veteran trees.
- Determine the root protection area and adopt a policy of minimal or sensitive activity within it.
- Consider establishing a further 'buffer zone' to protect the tree from indirect impacts and to provide a mixture of supporting habitats such as semi-natural grassland and scrub.


Laura Shewring

Tagging trees across a site, or in strategic locations, can remind others of the significance of ancient and veteran trees.

**Where impacts on the tree are already evident, the aim is to stop or reduce the causes**. This can be achieved by raising awareness and sharing your recommendations. However, **the challenges presented in different settings may also require some problem solving that may not yield immediate results. Lasting change in attitudes and practice can be long-term aspirations**.

## *Manage people and vehicle traffic*

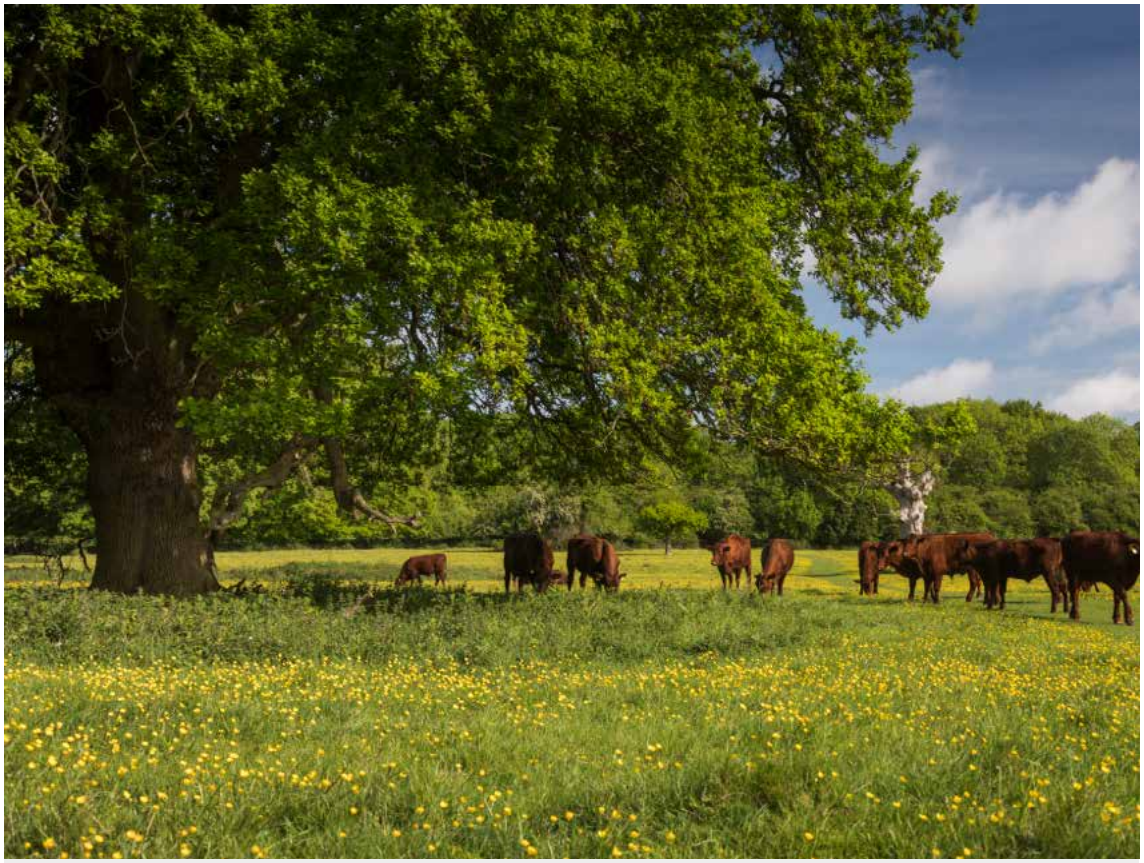
This comes down to the management of people and their activities, whose impacts can vary greatly between individual trees and sites. The success of this management depends on clear communication. Often, people are likely to be compliant with requests if they understand the reasons for them.

- Use signage, plaques, interpretation boards and other means (e.g. social media and newsletters) to engage stakeholders.
- Reroute paths and monitor and manage desire lines and cycle trails.
- Plan and designate vehicle routes. (For events such as festivals or markets, ensure that contractors follow marked routes and respect root protection areas. In forestry, map timber extraction routes and clearly communicate these with site operatives). In agricultural settings, this may become part of a wider controlled traffic farming (CTF) system.)
- Site and clearly mark car-parking bays well away from veteran trees.

## *Manage animal pressure*

Grazing management is crucial to the care of veteran trees. Restoring a more naturalistic, low-intensity grazing regime may be the ideal long-term approach to maintaining space around the tree. Too little and too much grazing pressure can each have negative results, so impacts caused by animals should be monitored and adjusted as necessary.

- Locate supplementary feed, salt licks, drinking troughs and manure heaps away from veteran trees.
- Limit the frequency and length of time that stock graze or congregate near ancient and veteran trees.
- Review shade and shelter provision and look to provide alternatives; for example, by creating new hedgerows and establishing in-field trees.
- Review the choice of grazing animals, breeds and stocking density.
- Arrange deadwood or cut brash to deter animals from gathering under impacted trees. Ideally, this material should originate from the site.
- Where stocking or wild herbivore pressures cannot be easily managed, consider fencing that still permits intermittent grazing around trees, such as those with gates or slip rails.





Choose cattle with characteristics that are appropriate and suited to the site.

## Minimise product applications

A variety of possible products may be added to the ground or sprayed in proximity to trees. These are rarely to the benefit of trees and should only be used where necessary.

- Seek to eliminate or reduce the use of fertilisers, herbicides, fungicides and application of lime or manures within the root protection area.
- Allow a further 'no-input' buffer zone beyond the root protection area. This may further reduce harm through protection from splashing and windblow of applications.
- Establish tree buffers or shelterbelts[60] to help intercept applications near to veteran trees.
- Use low-emission slurry-spreading technologies, such as trailing shoes, dribble bars and injections.
- Work with a vet to understand livestock worm burden and risk before choosing appropriate treatments, and then treat when needed. Careful and planned use of wormers also helps beneficial animals such as dung beetles, which play a role in parasite suppression[61].

## Provide physical protection

Barriers that physically protect trees can help to manage a number of co-existing impacts, particularly where attempts to reduce those impacts have been unsuccessful. The installation of a barrier can be temporary or permanent. Installation should be planned and supervised so as to avoid damage occurring in the process.

- Position a barrier or fence around the tree and its root protection area.
- Discourage access of people, animals and vehicles by using informal obstacles such as dead hedging; and allow vegetation to grow slightly taller (although not so much that it shades lower branches).
- Mitigate continued and unavoidable ground pressures as a last resort. Work with an expert to explore the appropriateness of alternative surfacing or boardwalks.

Richard Faulks

Post and rail fencing installed around a tree can protect the rooting area from several impacts, such as informal car parking during busy summer months as in this example.

## *Manage other trees and shrubs*

Clearance or other cutting of competing vegetation is an important way to achieve adequate space for ancient and veteran trees. This activity is often called haloing or halo thinning. Each tree will need to be considered individually, with a plan to approach any clearance in a gradual and thoughtful manner – drastic actions around trees can cause death.

- Plan careful clearance over a number of years. Factors to consider include the extent and density of shade (e.g. broadleaf vs conifer), and how long the tree has been shaded.
- Prioritise any vegetation growing within or in contact with the crown and up to five metres from the edge of the crown. This should be removed in the first action, especially if shading lower epicormic growth or a secondary crown. Further clearance should be determined in a management plan.
- Selectively remove trees and shrubs, depending on their species and size, in order to reduce shading more gradually. Ringbarking trees can also achieve a gradual reduction in shading.
- Build in capability to pause, delay or slow works if conditions are unfavourable. Take into account the local site microclimate as well as recent and forecast weather conditions (especially hot, dry weather)[62].
- Manage ivy where appropriate; for example, to ease shading on lower epicormic shoots or where trees have a high epiphytic value and where the conservation of these assemblages is important.
- Monitor vegetation responses and commit to routine management. Clearing space around trees might result in pulses of regeneration that could cause shading of a tree's lower trunk in a relatively short period of time.

Reg Harris

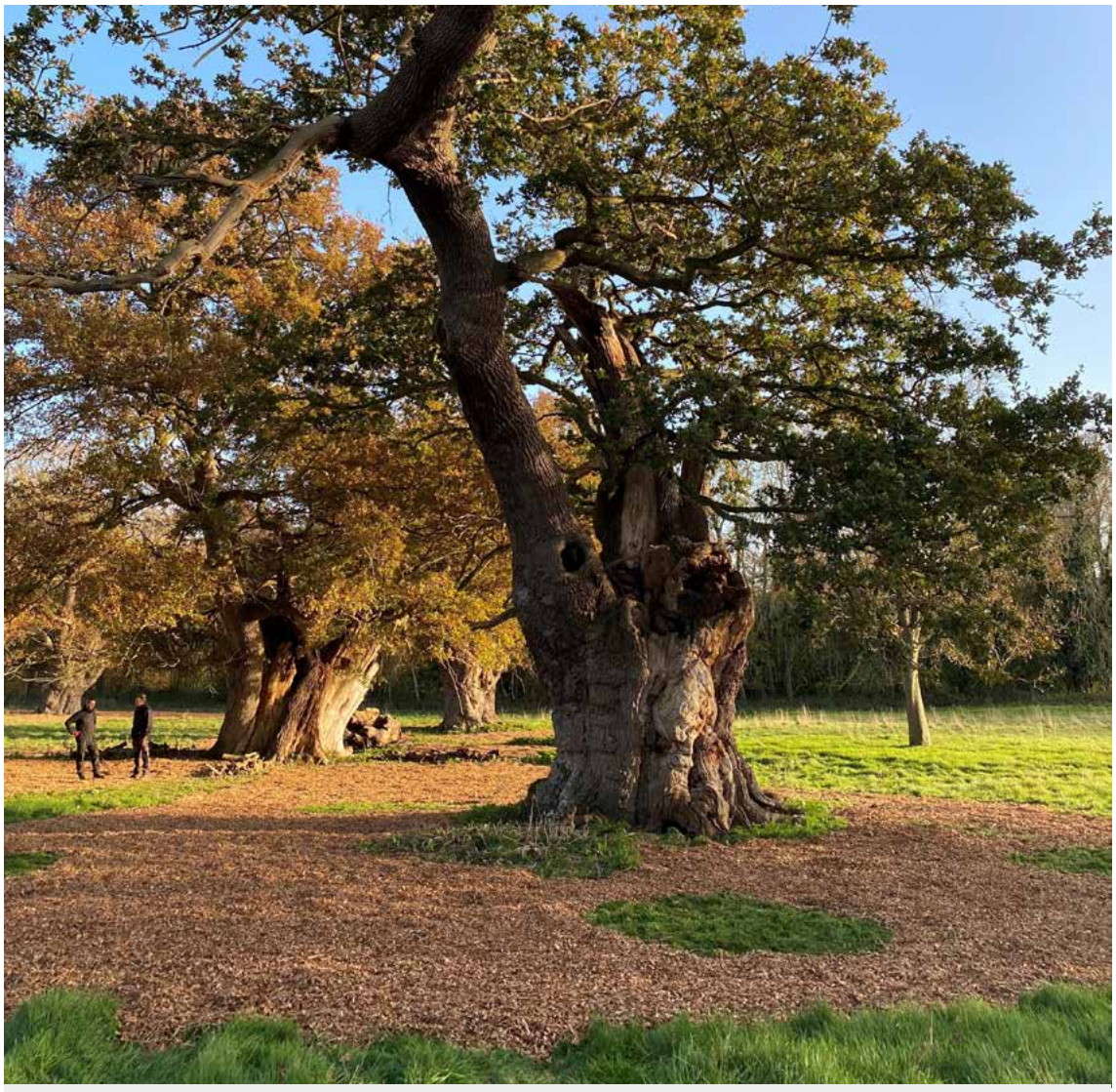
Reg Harris

Before and after image showing new pollard creation to reduce crown competition with a veteran tree.

## *Seek specialist advice to:*

### *Improve the rooting area*

Where soil conditions under a veteran tree appear to be unfavourable – for example, severe soil compaction – the first thing to do is to stop, or reduce the causes of those conditions. Further action may then be necessary to attempt to improve conditions in the soil and rooting area. **These should be prescribed by an expert**, who may first make an assessment of soil properties. Several options are seen in arboricultural practice, though most favoured is the application of a mulch, such as wood chip, applied as a thin layer within the rooting area. Commercial mycorrhizal inoculants are not known to help ancient and veteran trees under stress and should not be used due to their potential to do more harm than good[63].



David Piper

Mulches can be spread across the rooting area of trees and is sometimes only applied in small areas at one time.

Mark Zytynski/WTML

An ancient churchyard yew, belted to prevent the trunk from splitting apart.

Richard Faulks

Careful pruning of lapsed pollards can help to preserve their structure for longer.

## Stabilise the tree

Interventions to stabilise trees usually involve reductions to the size of a tree's crown, or remedial pruning. **These works should be prescribed by an experienced professional, as the result of a thorough assessment of whether such works are likely to be beneficial[64]. The goal must be to prevent a failure that risks the death of the whole tree or an unacceptable loss of its value**.

In some circumstances, it may be appropriate to restore lapsed pollards by slowly bringing them back into a regular cycle of cutting. Not all species respond well to this intervention; for example, there are different approaches emerging through research on oak and beech[65,66,67]. Again, the cutting of lapsed pollards always comes with a risk of hastening the tree's decline and should be determined for each individual tree.

## 2.3.1.2. Value decaying wood habitats

Deadwood is a rich habitat resource that supports many species and is one of the reasons why ancient and veteran trees are so valuable. Whether in the form of large limbs or smaller branches, any deadwood that falls or is cut from ancient and veteran trees remains part of their habitat value. In addition to valuing any deadwood from ancient and veteran trees, opportunities should be sought to increase deadwood volumes generally, as this is supportive of a wider saproxylic assemblage.

### Retain dead and decaying wood

- Keep any deadwood originating from ancient and veteran trees on site.
- Leave deadwood in a mixture of different environments. Wood left to decay in sunny and dry conditions generally supports different species than that in shaded and humid areas. Provision of deadwood in each of these conditions is considered ideal[68]. However, try not to move trunks and branches that have been lying on the ground for several months.
- Keep standing dead trees in addition to lying trunks and branches. Trees that have died standing, called snags, decay differently and much more slowly than wood on the ground.
- If other trees must be removed – for example, for safety reasons – leave tall habitat stumps[69], or monoliths, instead of felling them at ground level.


Emma Gilmartin

Signage that celebrates life in decaying wood habitats can help to raise the public's awareness.

Emma Gilmartin

Leave deadwood where it lies whenever possible.

## *Increase or supplement decaying wood*

- Ringbarking is the removal of the bark and vascular cambium around a tree's circumference, usually to kill it. When safe to do so, ringbark other trees to increase decaying wood volumes[70] or to reduce shading or crown competition from younger trees.
- Consider other actions that promote or support saproxylic species, including re-erecting felled trunks, and providing decaying wood bins and 'beetle boxes'[71].

Emma Gilmartin

Re-erecting felled trunks can help to provide long-term standing decaying wood habitat.

Emma Gilmartin

This bin of sawdust and other ingredients is a crisis measure for species on the brink. That is, where there is almost no remaining habitat to support them.

## 2.3.1.3. Look to the future

In order to secure the future of our ancient and veteran trees, establishment and good management of their successors is essential. **There can be a considerable lag time in establishing the veteran trees of tomorrow; new trees can take a long time to reach maturity and even longer to develop substantial amounts of decay**. This lag time is often not acceptable, and a delay in conservation action will greatly increase the long term risk of extinction of some species associated with ancient and veteran trees.

Seek to understand the age structure of tree populations and adopt a restoration management approach, even where populations of saproxylic species may appear to be healthy in the short term[72]. The ambition of restoration management should extend well beyond the level of an individual tree or even the site. **Take action beyond conserving trees in hotspots by providing conditions across landscapes that allow veteran trees of the future to establish**[73].

### Establish new trees via natural regeneration or by planting

The next generation of trees should be the right species in the right space. New trees can grow large enough to compete with existing ancient and veteran trees long before they would otherwise die or lose their value. Sufficient space should be provided to allow new trees to develop a wide and full crown at maturity. Trees growing at high densities are unlikely to ever produce large, spreading limbs that are often associated with open grown ancient and veteran trees[74].

- Identify mature trees that may become veteran trees in the near future. Tag these trees or mark them on maps and plans so they are also protected and cared for.
- Consider collecting seed from ancient and veteran trees and plant these locally.
- Establish successor trees at sufficient distance from ancient and veteran trees. As an example, for a tree with an expected crown spread of 15 metres, this would mean establishment at least 35 metres from the crown extent of an existing tree.
- Establish the same species or those with similar characteristics. It is generally recommended that successor trees are the same species as existing ancient and veteran trees. However, this is not essential, as many species share decay fungi and rot type. Many saproxylic species are associated with a rot type, such as white or brown rot, rather than a particular tree species.

### Promote the development of decay features in trees

Veteranisation is the practice of creating or accelerating the development of decaying wood habitats in living trees through deliberate damage that mimics natural damage[75]. **Veteranisation should never be undertaken on ancient and veteran trees**. Some treatments can require few resources and can be completed safely and from the ground. Other treatments are much more specialist and expensive, requiring a skilled climber and chainsaw operator.

- Select suitable trees for veteranisation: only young or mature trees with limited ecological value or decay features. Usually, these are trees that would otherwise be removed – for example, during thinning operations or halo clearances – or are within dispersal distance to existing veterans.
- Veteranise by damaging bark and by exposing the sapwood or heartwood, or by carving physical spaces which can be used by wildlife for nesting.
- Create new pollards. This practice of repeated cutting can increase the rate of trunk-hollow formation by several decades[76]. New pollard creation is particularly suitable at sites where there is evidence of past practice and where ongoing management is likely[77].
- Inoculate decaying wood fungi into trees, but only with expert guidance as this could involve the introduction of new species to a site. This may be most appropriate for boosting the populations of rare fungi[78] and dependent species, rather than as a common veteranisation treatment.

Emma Gilmartin

Young oak that has been intentionally damaged at the base with a sledgehammer, and further up the trunk with climbing spikes.

Richard Faulks

This hole was carved with a chainsaw several years ago, and now looks like a natural nesting cavity.

# 3. Survey form

## Step 1. Record

Further recording guidance at ati.woodlandtrust.org.uk

| Recorder(s) | | Date | |
|---|---|---|---|

**Location**

| Grid Reference | | | |
|---|---|---|---|
| Site Name | | Other identifier | |
| Access | | and | ☐ Woodland Trust site |

| Context | *(e.g. churchyard, hedgerow)* |
|---|---|

**Identification**

| Species | | or | ☐ unsure |
|---|---|---|---|
| Tag Number | | Local/Historic Name | |

**About the tree**

| Girth (m) | | at a height of | | above ground |
|---|---|---|---|---|
| Form | | | | |

| Living status | ☐ Alive | ☐ Dead | ☐ Unsure | Standing or fallen | ☐ Standing | ☐ Fallen |
|---|---|---|---|---|---|---|

**Decaying wood *(all that apply)***

| ☐ In the crown: | ☐ <10% decaying wood | ☐ <50% | ☐ >50% | ☐ >90% |
|---|---|---|---|---|
| ☐ Holes or water pockets | ☐ Hollowing branches | ☐ On the ground | | |
| ☐ Hollowing trunk: | ☐ with opening | ☐ with holes <15cm | ☐ with holes >15cm | |

**Wildlife**

| Evidence of | ☐ Invertebrates | |
|---|---|---|
| | ☐ Bats | |
| | ☐ Fungi | |

| Epiphytes | ☐ Cuckoo tree | ☐ Ivy | ☐ Mistletoe |
|---|---|---|---|
| | ☐ Moss | ☐ Lichen | ☐ Fern |
| *(Note protected, rare or other species, if known)* | | | |

Remember to take photographs of the tree, its features and causes of impacts.

# Step 2. Assess

**Roots and soil**

*(Describe what you see)*

| Impact | Cause | Measure *(optional)* | Notes |
|---|---|---|---|
| **Soil compaction or erosion** | ☐ Vehicular access or parking<br>☐ Footpath<br>☐ Animal congregation<br>☐ Materials storage | ☐ Indicative plants<br>☐ Extensive bare ground<br>☐ Water pooling<br>☐ Soil assessment | |
| **Disturbance and damage** | ☐ Ploughing<br>☐ Digging<br>☐ Animals | ☐ Within the root protection area<br>☐ Up to the edge of the crown<br>☐ Close to the trunk | |
| **Soil applications** | ☐ Fertilisers<br>☐ Pesticides<br>☐ Medicines | ☐ Within the root protection area<br>☐ Up to the edge of the crown<br>☐ Close to the trunk | |
| **Other** | ☐ *(Specify)* | | |

| | | | | | |
|---|---|---|---|---|---|
| **Trunk and crown** | *(Describe what you see – can you notice individual functional units?)* | | | | |
| | **Crown transparency (optional)** | ☐ 100–76% (less foliage) | ☐ 75–51% | ☐ 50–26% | ☐ 25–0% (more foliage) |
| | **Impact** | **Cause** | **Measure *(optional)*** | | **Notes** |
| | **Shading** | ☐ Non-native trees<br>☐ Young trees<br>☐ Mature trees | ☐ On 1–2 sides, but not from above<br>☐ Shaded on 3–4 sides, but not from above<br>☐ Shaded from above and one or two sides<br>☐ Shaded from above and all aspects | | |
| | | ☐ Ivy<br>☐ Other shrubs or climbers | | | |
| | **Damage and cutting** | ☐ Livestock<br>☐ Wild or feral animals | ☐ To <1/3 stem circumference<br>☐ 1/3–2/3 stem circumference<br>☐ >2/3 stem circumference | | |
| | | ☐ Machinery<br>☐ Vandalism<br>☐ Cutting and pruning | | | |
| | **Pests and diseases** | ☐ Suspected high risk pest or disease | | | |
| | **Instability** | ☐ Major tree surgery<br>☐ Recent failure<br>☐ Lapsed pollard | | | |
| | **Other** | ☐ *(Specify)* | | | |

| Surroundings | *(Describe what you see)* | | | |
|---|---|---|---|---|
| | **Impact** | **Cause** | **Measure *(optional)*** | **Notes** |
| | **Isolation** | ☐ No veteran trees nearby<br>☐ No mature, successor trees | | |
| | **Deadwood management** | ☐ Removal from the crown<br>☐ Removal from the ground | | |
| | **Future change, damage or loss** | ☐ Development<br>☐ Change in land management or farming practice | | |
| | **Other** | ☐ *(Specify)* | | |

| **Overall threat status** | *(Explain your reasoning)* | | |
|---|---|---|---|
| | ☐ Critical | ☐ Threatened | ☐ Secure |

**Repeat assessment**

| **Direction of change** | ☐ Improving | ☐ No change | ☐ Declining |
|---|---|---|---|

# Step 3. Secure

| Recommendation | Priority (*H/M/L*) | Notes |
|---|---|---|
| ☐ Avoid impact | | |
| ☐ Manage people and vehicle traffic | | |
| ☐ Manage animal pressure | | |
| ☐ Minimise product applications | | |
| ☐ Provide physical protection | | |
| ☐ Manage other trees and shrubs | | |
| Specialist advice:<br>☐ Improve the rooting area<br>☐ Stabilise the tree | | |
| ☐ Retain deadwood | | |
| ☐ Increase or supplement deadwood | | |
| ☐ Establish new trees via natural regeneration or by planting | | |
| ☐ Promote the development of decay features in trees | | |
| ☐ Other | | |

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