Managing woodland SSSIs with ash dieback (*Hymenoscyphus fraxineus*)

Joint advice from Natural England and the Forestry Commission

Contents

1. Purpose

This document provides management advice to anybody with a responsibility for the management of **ash in Sites of Special Scientific Interest (SSSI) woodlands**; and will also act as a reference to help guide consistent decisions by government officials who administer SSSI regulations concerning such woods. This document should be read and taken in its entirety; individual prescriptions should not be picked out of context.

2. Context

2.1 Policy and Guidance

This advice is based on the expert knowledge of UK researchers and practitioners, and informed by evidence and experience from continental European countries where the disease has been established for over 25 years. This guidance is in line with the government approach to ash dieback set out in the Tree Health Resilience Strategy, published in May 2018. It should be read in

conjunction with Forestry Commission Operation Note 046, and the forthcoming Operations note 46a and Tree Council guidance on managing ash in non-woodland situations.

2.2 Background

Over half of the woodland and wood-pasture SSSIs in England contain significant amounts of ash. As nationally important areas for the conservation of biological diversity, it is vital that the impact of ash dieback disease on the SSSI 'features of interest' is managed to reduce negative effects where this is possible. The woodland SSSIs are only *representative* of the total amount of woodland biodiversity, and as such, it is likely that this advice will be applicable to protecting biodiversity at a range of other sites with ash, especially ancient woods.

The long-term changes resulting from ash dieback are not yet fully understood or realised. Therefore, while various suggestions have been made in this document, it may be worthwhile trialling different management strategies, monitoring their effectiveness, and continuing to share practical experience, with appropriate consents in place. However, it is very important that this advice is tailored to the specific conditions on each site, starting with the SSSI features of interest, and considering: the current proportion of ash and other trees and shrubs present; the woodland structure; existing issues and challenges acting on the wood; its context in the surrounding landscape; the owner's objectives; public access and safety. Long-term planning is essential.

2.3 Existing challenges and wider resilience

Often the ash dieback disease is affecting woods which have existing issues and challenges, such as:

- A reduced range of tree and shrub species;
- Tree regeneration being unsuccessful – usually through either lack of light or grazing/browsing by deer and other animals (or both);
- A lack of structural diversity across the wood in terms of tree size classes, shrub layer, open space and dead wood;
- Damage to trees and regeneration from grey squirrels or other tree pests and diseases, or other negative influences like invasive non-native species and climate change impacts

Addressing these now is important, so we have more options for addressing ash dieback as the disease progresses. Action to address these issues will also help to ensure the wood is resilient to other pests and diseases and future climate change.

2.4 Law and permissions

The legislation that applies to SSSIs still applies on sites affected by ash dieback, and the guidelines for SSSIs can be found here: Sites of Special Scientific Interest: managing your land. You must comply with regulations protecting wildlife species and habitats when you're managing woodland and planning forestry operations. These include the European protected species (EPS) listed in the Conservation of Habitats and Species Regulations 2017 and the Wildlife and Countryside Act 1981.

You must carry out planned operations carefully, making the necessary checks, and you may need a wildlife licence in certain circumstances. If you follow good practice, you should be able to carry

out most activities without the need for a licence – but to do so you may just have to modify or reschedule some of your management proposals or practices.

Before changing any management practises, you will need written consent from Natural England.

The felling of diseased ash within woodland still requires a felling licence from the Forestry Commission unless they are dead or pose a real danger.

3. SSSI woodland and ash

3.1 Ash dieback and ash mortality

The level and rate of tree mortality will vary from site-to-site and can be influenced by a wide range of factors but, primarily, a tree's level of susceptibility to ash dieback (*Hymenoscyphus fraxineus*), is determined by its genetic makeup (genotype). Trees with a very low level of disease tolerance can die very quickly and even large trees can succumb in a few years. Other trees can tolerate the disease for longer periods of time and some trees, with high levels of tolerance may appear largely unaffected. Trees are likely to be more susceptible if they are poor specimens and/ or suffering additional stresses, for example from water logging or over-crowding. Secondary infections, such as those caused by honey fungus (*Armillaria* spp.) can significantly increase mortality rates. Younger trees are more susceptible than older trees, although mature trees can succumb surprisingly rapidly.

Trees showing 0-25% of their crowns affected, can be considered as having a good level of disease tolerance where they are within a known area of infection and surrounding trees are more severely affected. It can take several years following the arrival of ash dieback at a site to identify the more tolerant trees. Tolerant trees can still produce good annual growth increment. Trees with more than 50% of the crown affected will show little or no annual growth increment and are likely to die. Tolerance to the disease is highly heritable, and will be passed onto new generations of trees.

Within Europe to date, no trees within infection zones have been found to be completely free of the disease, yet very recent research has shown that some degree of local resistance may be possible. Of a sample of 140 trees tested from the UK, 1 in 6 showed resistance as a heritable trait genetically, although the geographical distribution of this is still being researched, and this may not play out under infection conditions. Other studies have shown that ash trees which come into leaf early and shed leaves early are more likely to be tolerant to the disease. However, there is some suggestion that the genes conferring resistance may be linked to those giving lower tolerance to herbivory by mammals.

At best, the conclusion from studies in continental Europe estimate 2-5% of the ash population will remain unaffected by the disease, whilst Kjær et al (2011) believe that under current infection pressure, only 1% have the potential of producing tolerant offspring and even then they will be expected to have up to 10% of their crowns damaged by ash dieback. Current research from European sites indicates they have suffered up to 85% mortality, and that natural ash woods showed lower mortality than plantations (Coker et al 2018); however, the disease continues to affect these sites, and this is not likely to be the final outcome.

3.2 Designated Features on SSSIs

This is the starting-point for all considerations concerning the biodiversity value of the wood, and whether or not they are still being met, in the presence of the disease. This will guide the management of the wood, and what activities will be consented. For example, woods may be notified because they are a good example of ash woodland, or of native woodland; or because they contain a rich and diverse ground flora, or for assemblages of species (invertebrates, birds etc.). There may be one interest, or a suite of interests to be considered.

It is important that even if the wood is notified for "ash woodland", we continue to manage the site as an important ancient woodland; in the event of its losing ash mostly or entirely, Natural England will take a decision on whether it still merits designation as an SSSI. However, specific actions (i.e. removal of ash) could be directly against the feature of interest. In the wake of Dutch elm disease, for example, a suite of woods were re-notified because they were still considered important ancient woodlands; while some were de-notified because they no longer contained sufficiently high-value woodland

The citation outlines what particular characters were felt to be important at the time of notification, and these will serve as a starting-point to guide management decisions.

3.2 How will the designated features be affected?

Many SSSI woodlands containing ash are designated for their W8 or W9 ash woodland vegetation community (NVC), often on ancient woodland sites, or found in mixtures with oak in W10. They often have outstanding ground flora, rarer plants species like the helleborines, rich lichen assemblages, and can have a high diversity of native tree and shrub species associated with these communities. They may also be designated for invertebrate assemblages including moths, butterflies and saproxylic (deadwood) invertebrates, woodland birds, molluscs and bats.

Recent research has shown that ash has unique ecological properties and functions in these woodlands and is at one end of a spectrum for many qualities such high nutrients in senescent leaves and low lignin, meaning it has the ability to rapidly cycle soil nutrients, its bark pH, and the dappled light beneath its canopy in high summer. Other tree species do not do this, and the ground flora could change as a result of this. Across the UK, 955 species make use of ash trees, as a habitat although on any one site only a proportion of these will be present. Some of these are obligate or highly dependent on ash. These species are vulnerable and likely to decline if suitable alternative habitat is not provided, when ash dies.

3.3. Condition assessment

Many woods will maintain their woodland interest if we can succeed in diversifying the native tree and shrub species present (see above), and/ or if we find disease-tolerant ash.

If a site has ash dieback, it will not automatically go into unfavourable condition, but will go onto our threats register. Natural England standard target for tree disease is: "*No rapid loss of native species due to unnatural factors (greater than 10% in a five year period)*". This will trigger a site to be switched into unfavourable condition, but if the landowner were already in discussion with Natural England about diversifying the tree and shrub species, and taking steps as set out in this guidance, the site condition may be classed as *unfavourable recovering*.

This means decisions on condition should follow this approach:

- If a woodland does not have ash dieback, then there is no impact on condition. However, where its features are AT RISK then a Condition Threat and appropriate Action should be recorded. The Action may include establishment of a management strategy to diversify and reduce other stress factors, prior to the arrival of the disease.
- If ash dieback is present, and:
- If the loss of native species is less than 10% over a 5 year period, then there is NO impact on condition, but we try to manage it (and this must be recorded via an appropriate Condition Threat Action); OR
- If the loss of native species is greater than 10% over a 5 year period, then condition is UNFAVOURABLE and either:
    - If appropriate management is in place to manage a shift in component species to re-establish the woodland structure, then if this is the only factor affecting condition then it is unfavourable recovering. A Condition Threat Action must be recorded to reflect the continuing need to manage the site; OR
    - If appropriate management is not in place, then an unfavourable declining category is likely to be most appropriate if the impact of the disease is continuing to increase.

In the future, if there is a permanent adverse effect that fundamentally alters the notified features of specific sites, then advice will need to be sought as to the way forward.

In summary:

The *risk* of ash dieback does not have any impact on current condition:

- If ash dieback is *present*, then there must have been a loss of more than 10% of native species over a five-year period before condition is affected.
- Where more than 10% of the trees are badly affected and it can be demonstrated that this is having a detrimental impact on the designated features, then the wood should be classed as unfavourable. Where a plan is in place to address the issues and protect the designated features then the wood should be classed as recovering.

4. Management of ash woodlands

4.1 Health and Safety Implications

Diseased trees that are dying are more likely to shed limbs, or lean and collapse. Where this is likely to pose a safety hazard (adjacent to roads, footpath or in heavily used areas etc.) such trees should be felled (with an appropriate felling licence in place). There is guidance available on safety measures to undertake during this operation: the Forestry Industry Safety Accord (FISA) has developed ash-specific guidance for forest managers entitled Safety Guidance for Managers – Felling Dead Ash.

Further information about tree safety in general is available in the National Tree Safety Group's publication Common sense risk management of trees.

In terms of managing an SSSI, it is important that if machinery is required to fell trees, that it is low-impact in areas of rich ground flora, and that all possible precautions are taken to minimise ground flora disturbance and soil compaction (e.g. brash mats). Consent for these activities is required.

4.2 Woodland Management Planning

We strongly recommend that all owners of woodland containing ash prepare or amend management plans. Before making any changes to existing management regimes, owners and managers should carefully consider their objectives and local circumstances, including the structure and composition of the woodland. Consents to change management may be required from Natural England.

Regular monitoring by land managers will help them assess the health of ash trees, as the disease progresses is important. (We'd suggest at least annually between late July and early August), along with identifying phenotypic traits like early leaf budding and senescence. However, premature conclusions regarding levels of disease tolerance should be avoided, as the health of individual trees can vary from year to year. Mature ash with epicormic growth from the main stem, or broomstick growth in a secondary inner crown, indicates a highly stressed tree which is likely to die faster.

4.3 Felling diseased trees

Felling diseased trees will not limit the spread of this wind-dispersed disease to other parts of the wood. It is likely that the remaining ash trees have already been exposed to the disease anyway as the spores are wind-borne. Studies have shown that ash trees present at a low proportion of mixed stands are no less affected by the disease than whole stands of ash, although clearly the overall impact on the stand will be less in mixed stands.

Thinning dense stands of diseased mature ash is inadvisable, as ash does not respond well to such thinning treatment. If the stand is young enough (<25 years), a "pre-thin cleaning" may give dominant trees an advantage of reducing competition; older stands may be halo-thinned around a highly tolerant tree, or around other tree species to promote generation of them, or managed by creating canopy gaps to allow more regeneration and structural diversity. Each time an ash tree produces seeds, they will be of a different genetic make-up to their parent trees. This gives opportunity, potentially each year, for more tolerant ash to grow.

Felling a large proportion of mature, diseased ash in the same stand, whilst retaining a few tolerant trees can have the effect of suddenly raising the water table, thus stressing the remaining trees and making them more vulnerable to infection by honey fungus. It is preferable to retain more mature trees as a structural component of the woodland.

Where it is appropriate to fell some diseased ash (see Table 1 below) then a felling licence will be required from the Forestry Commission.

4.4 Felling healthy trees

It is worth keeping as much of the current population of ash trees as possible to maintain a diverse genetic resource, and identify and retain those trees (and any of their progeny) showing the highest levels of disease tolerance. However, there is a balance to be struck between maintaining the current population of trees, and promoting new regeneration, allowing genetic turnover, which is important because tolerance is highly heritable. Therefore, some management, and promotion of natural regeneration, may be advisable. Most young trees tend to grow best where “woodland conditions” are maintained (dappled shade, uncompromised soils, etc.).

However, thinning or harvesting mature ash as part of a normal programme of silvicultural management of the wood could continue in line with the advice in Table 1 below. In uninfected sites where thinning operations are required, we suggest ash trees with the biggest crowns and / or those which are prime (biggest and healthiest) amongst their cohorts are retained. Once stands become infected, such trees in addition to all specimens showing the highest levels of disease tolerance should be retained and promoted as these will have the best chance of survival and reproduction. Thought should be given to what will regenerate beneath dying or felled trees, and whether planting is necessary and appropriate (see below).

Sites with high air and/or soil humidity will lead to increased spore production from the *Hymenoscyphus fraxinea* fungus.

The fungus re-infects the trees each year. In some situations, a dense understorey may act as a physical barrier to the fungal spores reaching the canopy after they are released from the fruiting bodies on the fallen leaf stems. Spore density is highest near the ground (0-5m). However, as a note of caution, the fungus can also infect through the roots.

Prime specimens, such as those above average size with larger crowns tend to survive best, therefore thinning tightly packed younger stands could help. It should be noted that within stands comprised of trees with low levels of disease tolerance, thinning operations is unlikely to reduce the impact of the disease. Very heavy thinning and salvage operations to remove dying trees, has been shown to accelerate the disease (Alsop, 2015).

If there is potential for high mortality i.e. lots of vulnerable ash, retaining even moderately healthy trees – especially if they are seed bearing - will help maintain forest conditions (preventing coarse ground vegetation smothering any regeneration) and avoid stand collapse. Tree species other than ash should be promoted by halo thinning around them. This will aid future stand management and provide shelter for any under-planting or natural regeneration.

In all cases, felling should be consented by Natural England, and carried out with a felling licence from the Forestry Commission.

4.5 Coppicing, Pollarding and Veteran Trees

Unless coppice stools harbour unusually good levels of disease tolerance, they can be particularly susceptible - especially recently cut ash coppice re-growth. Evidence from Suffolk has shown that coppicing ash trees will result in the death of 80% of the stand within three-four years (Fuller 2016). A decision to continue coppicing may be taken, however, if the wood is currently in active coppice management, and the feature of interest would be disrupted by discontinuing. E.g., ground flora, dormice, etc., will benefit from continuing the coppice regime.

(I.e. the benefits of the temporary open ground is more important than the ash stools themselves). Appropriate actions will be guided by the SSSI citation and management plan objectives. Managers should be aware that they will need to promote regeneration, or potentially replant with other coppice species (see section 4.7), in the event of the death of the majority of the ash stools. This should occur as part of the ongoing coppice cycle, in small coups, rather than across the whole site, so that the conversion would be gradual, throughout the coppice cycle. Continuing with a regular cutting cycle will also allow any resistant ash stools to be identified more quickly, and will maintain the coppice conditions which are potentially supporting other woodland wildlife (such as ground flora and butterflies etc.). It will cause disruption to the product in the following cycle, as the gapping up will take longer to re-establish.

Old/ veteran ash pollards in a regular pollarding cycle should continue to be cut provided they are healthy. These trees have a better chance of survival possibly because of the compartmentalisation within the stems (Bengtsson 2015). If the cutting of pollarded trees is not required imminently, then in order to avoid unnecessary works, monitoring the health of such trees as the disease progresses may be the most prudent measure.

Re-pollarding previously neglected pollards (or veteran coppice stools) should not be undertaken, as this will place too much stress on the tree where it is also under infection pressure.

Veteran ash trees (other than in-cycle pollards) should never be cut without an overwhelmingly good reason as it puts the tree under stress. If the tree is susceptible to ash dieback the 'pathway' for the disease to the main stem is shortened when the tree has been cut, the new shoots are worst affected, making it difficult for the tree to recover from the intervention.

By not undertaking surgery, some veteran ash might undergo very severe mechanical failure. However, ash sometimes survives quite well after such a failure, although this will be tempered if new growth is affected by the disease.

4.6 Dead Wood

Potentially ash dieback, especially if accompanied by honey fungus, could lead to a sudden influx of dead wood. There is no reason why a proportion of this cannot be used or marketed as firewood (with consent) although dead ash becomes powdery quickly. However, dead wood is an important resource in woodland ecology, and, because of our exploitation of them, woods in this country have a lower dead wood resource than in a natural forest. It would benefit the biodiversity of the wood if a proportion of deadwood were retained (both standing, where safe to do so, and fallen). The minimum proposed by UKFS is 20m^3/ha and UKWAS is at least three standing/fallen decaying trees per ha. More is desirable on most SSSIs (100m^3/ha may be an aspiration on some sites). If it is likely to impede woodland management, it can be moved, but still retained.

It is worth noting that bats, which are European Protected Species, are likely to quickly find and utilise dead and dying trees. Full surveys for EPS should always be undertaken when carrying out management works.

4.7 Replacement trees

Initially, promote populations of native trees already found on the site. To identify which alternative tree species could be encouraged to support the wildlife supported by ash, we recommend studying the ash species database and report here. Making this specific to individual sites will involve checking the NBN and/ or using other survey data to find out what wildlife species are present, then checking their level of association with ash using the database. In addition, the selection of alternative species should also consider their suitability for the site conditions. The Ecological Site Classification tool can assist with this, however please note it does not include some common native species that might be appropriate, like field maple and hazel.

We recommend encouraging those tree and shrub species which support ash wildlife, focusing especially on any species historically lost from the site through previous management. Where this information is not available, consider promoting other native trees associated with ash habitat at your site using the appropriate National Vegetation Classification community as a guide, and being informed by the composition in nearby semi-natural woodlands on similar soil types. This is not a definitive list, but where appropriate, these may include other main canopy trees like oak and beech; make use of currently less frequent species like birch, rowan, whitebeam, aspen, hornbeam, willow, alder, lime, yew, holly, field maple, hazel, wych elm, cherry; and also key nectar bearing species such as hawthorn, blackthorn, crab apple, dogwood, rose. There may be a case for introducing tree species which are at the limits of their current natural range at the site in question where it would be expected that these species might arrive naturally over the next few decades (e.g. beech).

Tree and shrub species should be established by natural regeneration where possible – e.g. by creating space for new regeneration around existing specimens of the desired trees and shrub species. Ash regeneration could be an important part of the mix: in any event, it should not be cut out or destroyed, and would benefit from being protected. Deer management is especially critical for the success of natural regeneration.

If stands/ woods are dominated by ash, or have very little or no seed source of the desired species, then planting could be considered. Planting stock should ideally be grown on from trees already in the SSSI or from sites nearby. This will help retain genetic adaptation to the site present in these species. Outside SSSIs, especially on new planting sites, the inclusion of up to 20% exotic species and 20% 'naturalised' species may be acceptable for 'new native woodland'. We do not recommend using this material on SSSIs. Likewise, while the use of provenances of native species from 2-5 degrees south of the planting site as a component of the planting mix outside of SSSIs is recommended as a possible strategy for aiding adaptation to future climate change, this does not apply to SSSIs for the reasons given above. The key function of SSSIs is to protect the native biodiversity (including genetic diversity) across the country and to use these sites as a natural touchstone for future environmental change. The use of planting stock acquired from continental Europe carries a significant biosecurity risk so we recommend only using plants sourced and grown here in the UK.

Introducing non-native (to the UK) tree and shrub species to an SSSI is not usually acceptable or necessary for the management of the site and its features (but see below).

Many SSSIs with ash also have a proportion of sycamore. As a non-native tree, sycamore (especially the seed bearing trees) has been cut out of many SSSI and other nature conservation sites in the past, in an attempt to control its spread – often because of its shady canopy which can limit the rich ground flora associated with ash. However, recent research has shown that sycamore has similarities to ash in some respects, in terms of the species it supports (nearly half of those associated with ash can also use sycamore) and some of its other ecological functions (nutrient cycling) and qualities (such as its similar bark pH – important for some lichens). In European ash forests sycamore is a native component, and it has now naturalised itself into many UK woodlands. As a veteran tree, sycamore can provide an excellent habitat for bats in its flaky bark, and heart rot qualities similar to ash (white rot).

It is likely that where sycamore is present with ash, and the ash dies, that sycamore will fill the gaps if left undeterred. We need to consider on a site basis how appropriate this is, and whether it is better to have natural regeneration of sycamore or introduced planted stock of other species like oak, lime or beech, which may, in any case, have similar shady canopies to sycamore. Sycamore is more vulnerable to squirrel damage than many native species and this should also be considered if timber production in an objective.

Where sycamore is *not* already present on an SSSI, it should *not* be introduced. Where it is present and the impact of sycamore on ground flora is a concern we recommend manipulating stand structure to allow more light to reach to forest floor, and maintaining the total amount of sycamore in the canopy at a low proportion, ideally below 15%.

5. Summary of responses to ash dieback

Table 1: Varying the response in relation to the proportion of ash on the site: There will be different responses for different amount of ash on site. Assuming soil conditions are suitable throughout for ash: if only part of the site is suitable for ash, this applies to the part where ash is growing (or has potential to grow). For any specific site, more than one of these scenarios might apply. Alternative options, which may be appropriate, should consider the features of interest of the site.

	Low ash <25%	**Medium ash 25-75%**	**High ash >75%**
High Forest	Ash scattered through mixed broadleaf woodland. Leave the ash: survival important. Promote regen. Thin if needed to promote crown development and space for regeneration.	Diversity age structure, and open up stands around minor species to promote their regeneration and regeneration of 'prime' & any tolerant ash. Halo-thin prime ash.	Re-structure stand; Halo to promote crown development in 'prime' ash; and encourage space for ash regeneration: small coup fellings (0.25-0.5ha). Promote natural regeneration of ash and other tree species. Under-plant ash with appropriate species as the ash canopy thins.
Young ash (<25 years old)	Protect seedlings/ saplings from browse and fraying. Promote ash and other natural regeneration	Protect seedlings/ saplings from browse. Promote ash and other natural regeneration	Protect seedlings/ saplings from browse. Pre-thin/clean to promote healthiest specimens; encourage diversification Where over 50% mortality, clear dead stems, and protect survivors.
Coppice	If in mixed coppice stand – cut all stools on normal rotation and promote regeneration/ layering of other coppice species around ash stools. Leave ash standards.	Where ground-flora/ inverts of coppice are important and/ or comprise the designated feature, then re-coppice and gap up with other suitable coppice species; allow and promote ash regen as well. Promote other species of coppice. Leave ash standards.	Coppice in rotation and be prepared to gap up with other coppice species after ash mortality. This course of action assumes that the priority for the site is the structure, ground flora and temporary open space. Promote other maidens
Neglected (overstood) ash coppice: ***Old stools are a veteran interest feature. Retain where possible, for as long as possible.***	Leave overstood ash stools - they are more likely to survive and seed uncut. Get more light into stand by thinning/ re-coppicing other tree species to promote regeneration.	Trees will most likely die within 3-5 years after being cut. They will probably survive longer uncut (be aware that their structure increases the likelihood they will collapse). They will continue to seed longer while they are alive. This is important. Retain overstood coppice, especially veteran stools. After veterans die, retain stumps as deadwood hulks. Is coppicing a practical option? Could management to begin change to an 'irregular' forestry system that will increase light to benefit woodland and promote other regeneration. Retain ash maidens, establishing other components; retain some ash stools and thin to encourage regeneration.	

6. Case studies.

Derbyshire Dales NNR: Upland ash wood, >75% ash, high forest, steep sided.

Management objectives: nature conservation; previous plan: minimum intervention

No-change scenario: lose the majority of the woodland in the reserve, with no other seed trees in the vicinity. (This reserve is >90% ash)

Management decisions: After serious research into the ecology and habitat of the upland ash woodland type (Alsop 2015), and a risk assessment and prioritisation for action taken, to focus work across 25% of the site over the next five years (Alsop and Goldberg 2018), the management is looking at restructuring the wood, starting with the most stressed, and younger stands which are most likely to be adversely affected the fastest. Lost species such as small and large leaved lime and yew planted in small coups in the highest priority areas.

Expected result: this reserve is likely to lose significant amounts of canopy over the next twenty years. By planting in some species that have formerly been lost (by previous management), the wood will retain canopy into the future.

Monks Wood NNR, Cambridgeshire: Lowland mixed broadleaved wood, 25-75% ash

Management objectives: nature conservation; previous plan: minimum intervention (formerly coppice, but little of that structure remaining)

No change scenario: lose a significant amount of canopy

Management decisions: Monks Wood was virtually clear-felled before the First World War; it is not a stranger to open space. It has many rides running through it, which are species rich. It is very well studied. Although ash is a dominant tree species, there are other tree and shrub species in the wood. This is a good test case to promote natural regeneration. The biggest threat to management is deer. The other factor is public use; in order to retain the interest in the rides, some coppice work will continue along the ride edges; this will allow management of dangerous trees as well.

Expected result: the canopy will become significantly thinner. Initially, shrubs will dominate. The hope is for regeneration to boom, and promote some survival! It will be a learning opportunity.

7. References and further reading:

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For further information on the disease and its management, see the Forestry Commission website https://www.forestresearch.gov.uk/tools-and-resources/pest-and-disease-resources/chalara-ash-dieback-hymenoscyphus-fraxineus/