



Department  
for Environment  
Food & Rural Affairs

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# **Chalara Management Plan**

**March 2013**

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# Summary

This Chalara Management Plan for England is an updated version of Defra's interim Chalara Control Plan published in December 2012. It:

- i. Provides an update on the action Government and others have already taken in response to the disease;
- ii. Sets out new science-based and proportionate action that will be taken now that our understanding of Chalara and the costs and benefits of action has developed further; and,
- iii. Outlines further work that will be undertaken to develop our understanding of the disease.

The key actions are:

## Objective 1 - reducing the rate of spread

- The Government will pursue a collaborative and largely voluntary approach to slowing the spread in England supported by grant funding. **Ongoing.**
- The Forestry Commission (FC) will publish guidance on cost effective options for removal, disposal and replanting. **By April 2013.**
- The FC and Natural England (NE) will publish further guidance on the grant funding measures of this Management Plan. **By April 2013.**
- The FC and the Food and Environment Research Agency (Fera) will conclude the trace forward work in high priority areas. **By July 2013.**
- Fera will trial prospective shortlisted treatments for Chalara during 2013. **Ongoing.**

## Objective 2 – developing resistance to the disease in the ash population

- The FC will plant young ash trees in infected areas, before the start of the growing season, to screen for possible sources of resistance. **By May 2013.**
- Defra will commission research to identify and exploit resistance in UK ash trees. **Ongoing.**

## Objective 3 – encouraging citizen, landowner and industry engagement in surveillance, monitoring and action in tackling the problem

- The Forestry Commission will work with stakeholders to develop revised guidance in light of this Management Plan. **By July 2013.** This will include guidance on suitable species to replant. **By April 2013.**
- FC and Fera will work with citizens, landowners, industry and other interested parties to tackle the disease, via initiatives such as ObservaTree and OPAL. **Ongoing.**

## Objective 4 – building resilience in woodland and associated industries

- The Government will support forest managers and their supply chains as they respond and adapt to Chalara. **Ongoing.**
- The Government will work with the nursery sector, to explore how the impact of Chalara on businesses that supply amenity trees can be minimised. **Ongoing.**
- The Government will work with public and private land owners to understand the potential health and safety implications of Chalara. **By March 2014.**
- The Government will work with stakeholders to address the impact of Chalara on non-woodland sites. **By March 2014.**

The Government will develop the next version of the Chalara Management Plan for publication by March 2014. It will also provide an initial response to the independent Tree Health and Plant Biosecurity Expert Taskforce final report later in 2013.

# Introduction

*Chalara fraxinea*, a fungal pathogen which causes dieback of ash trees, was discovered for the first time in Great Britain in a nursery in Buckinghamshire in February 2012. In October 2012, it was also discovered in the wider environment in woodland in Norfolk.

The Government believes the economic and environmental resilience of our forests, wooded areas and other trees, and the associated industries go hand-in-hand. Our trees, woods, forests, hedgerows and landscapes are a vital national asset providing multiple economic, social and environmental benefits. In 2010 the forestry and primary timber processing sector contributes £1.7 billion in gross value added to the UK economy, supporting around 43,000 jobs<sup>1</sup>. Woodlands alone in Britain provide at least £1.8bn per year (2012 prices)<sup>2</sup> of social and environmental benefits (see Annex A for further details).

As it recently set out in its response to the Independent Panel on Forestry's report, the Government is committed to protecting Britain's forests and woodland from an ever increasing range and scale of threats. As part of this response and fulfilling our objective of expanding woodland assets, it is undertaking a range of initiatives that seek to bolster the economic resilience of the sector. This includes promoting quick-start guidance for the UK Forestry Standard and Guidelines to assist landowners and businesses to understand and access the opportunities and benefits gained from effective woodland management. The Government is also supporting work by Dr Peter Bonfield, who will chair a panel of business leaders to create a viable economic, social and environmental future for woodland and forest industries. The plan, Grown in Britain, will have a particular focus on creating market demand for the wood industry supply chain and exploring new market opportunities that will drive new jobs, skills and growth across the UK.

In developing this Management Plan on Chalara we have been guided by the Government's overall policy on forestry which is based around a clear hierarchy of priorities: protecting, improving and expanding our public and private woodlands assets. The management of our trees and woodlands, whether for timber production, for their biodiversity and landscape benefits or for access and recreation, is a long term endeavour. The full impact of Chalara will not be seen for at least a decade as infected mature trees will continue to survive for several years. Therefore Government will continue to work with nurseries, land owners, environmental and other groups to develop a more strategic approach to understand the economic, social and environmental impacts of the disease, secure long-term resilience of woodlands and other trees and the supply chains that support them.

The Government has discussed with stakeholders and other interested parties what appropriate action might therefore be taken to slow the spread of Chalara and mitigate its impact. Following these discussions the Government and a core group of stakeholders has

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<sup>1</sup> ONS (2012) Annual Business Survey as cited in Forestry Commission Forestry Statistics 2012

<sup>2</sup> Willis et al (2003) The Social and Environmental Benefits of Forests in Great Britain

concluded that the objectives, which it set out in the December 2012 interim Control Plan, should remain for now. These are:

- Reduce the rate of spread of the disease;
- Develop resistance to the disease in the ash tree population;
- Encourage landowner, citizen and industry engagement and action in tackling the problem; and,
- Build economic and environmental resilience in woodlands (and other non-woodland trees) and in associated industries.

Even though the disease cannot realistically be eradicated, work is underway to explore potential effective treatments, and action that can be taken now to help us adapt and build our economic and environmental resilience in the face of Chalara. Action in this plan will therefore focus on:

- **In the long-term**, producing and establishing more resistant populations of ash trees and help our woodlands adapt so that they continue to provide a wide range of benefits and services; and,
- **In the short and medium-term**, taking proportionate, cost-effective action to reduce the rate of spread of Chalara; and, support land owners and woodlands managers, nurseries, and others to mitigate the impacts of the disease.

## Non-woodland trees

This management plan focuses heavily on tackling Chalara in woodland settings. Ash is a native tree found naturally or planted in the countryside, in fields and hedges, on the sides of roads and railway lines, and also in urban parks, gardens and streets. We recognise the importance of addressing the impact of Chalara on those sites and the next phase of our work with stakeholders in the year ahead will examine the best ways of doing that.

## Devolved Administrations

We are working with the Devolved Administrations (DAs) to ensure a coordinated approach based on a shared evidence base and similar set of objectives for tackling the disease. Implementation will reflect the policies and circumstances in each country. Therefore, the implementation measures in this Plan relate to England only. In summary, Devolved Administrations are taking the following action:

**Northern Ireland** is working with the Republic of Ireland to develop a joint all-Ireland Chalara management plan which will seek to contain and eradicate the disease and to minimise the risk of the disease becoming established in Ireland. The plan will have four aims: (i) reduce the risk of the disease becoming established; (ii) support research; (iii)

encourage stakeholder engagement; and (iv), plan for resilience in woodland/woodland industries in the event that the disease becomes established there.

The **Scottish Government** has established a Scottish Tree Health Advisory group which is developing a Scottish action plan which will complement measures taken elsewhere in Great Britain. As a part of this, the Scottish Government is looking to see if any action could delay the arrival and spread of the disease in areas to the north and west of Scotland, where there is currently limited distribution of known infections, and the ecological value of the upland ash woods in strongly oceanic conditions is high. An assessment of the potential impacts of Chalara in Scotland has been produced and is available at [http://fcnotes/pdf/WorrellReport-ChalaraImpacts.pdf/\\$FILE/WorrellReport-ChalaraImpacts.pdf](http://fcnotes/pdf/WorrellReport-ChalaraImpacts.pdf/$FILE/WorrellReport-ChalaraImpacts.pdf)

The **Welsh Government** continues to support the four objectives set out in this Defra Management Plan. It has developed its own plan which reflects the distribution of ash and specific requirements for Wales.



# Key facts

## Key facts about ash in United Kingdom

- Ash trees in woodlands of 0.5 hectares or more in size cover 141,600 hectares in Great Britain (5.4% of total woodland) and 110,400 hectares in England (9.2% of total woodland)<sup>3</sup>. In addition to this there is a further 38,500 hectares of ash in Great Britain's woodland of less than 0.5 hectares (32,100 hectares in England)<sup>4</sup>. Ash is estimated to be 15% or 22 million tonnes of the standing UK hardwood resource stock<sup>5</sup>.
- Ash coverage is most prevalent in the south east (in particular West Sussex, Hampshire) and in Herefordshire and Worcestershire. The highest percentage of ash in broadleaved woodland is in a belt through the midlands from Gloucestershire to Lincolnshire.
- Ash is one of the most common trees in hedgerows, parks and gardens and along roads and rail networks. It is also one of the most frequent and widely dispersed veteran trees, often pollarded and very important for wildlife.
- Ash timber is one of the most valuable native hardwoods, with a variety of high value uses. Britain is one of the larger producers of high quality ash timber in Europe. The low moisture content of ash has always made it the most sought after firewood, and with the recent upsurge in usage of fuelwood this is an important market for the lower grades of ash wood.
- The supply chain for ash saplings and more mature amenity trees is complex, involving nurseries, woodland managers, sawmillers, retailers and landscapers. There are estimated to be 60-80 enterprises in the UK nursery sector dealing in ash<sup>6</sup>.
- Approximately half of ash saplings and young trees planted in the UK are imported. The annual value to UK importers of trading young ash trees is tentatively estimated at up to £300,000<sup>7</sup>.
- There are 665 Sites of Special Scientific Interest in England where ash forms a major component and it is an important component of many other sites of high environmental value<sup>8</sup>. It is a common component of many different types of native

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<sup>3</sup> Forestry Commission (2012) National Forest Inventory: Preliminary estimates of quantities of broadleaved species in British woodlands, with special focus on ash

<sup>4</sup> Centre for Ecology and Hydrology (2013) Countryside Survey: Distribution of ash trees (*Fraxinus excelsior*) in Countryside Survey data

<sup>5</sup> Confor

<sup>6</sup> Horticultural Trades Association (2012) Impact of Chalara fraxinea on UK ash tree growers

<sup>7</sup> Estimate based on tree numbers from the Forestry Commission and the industry

<sup>8</sup> Joint Nature Conservation Committee

woodland: wet woodland in valley bottoms, mixed deciduous lowland oak/ash woods on clays, ashwoods on chalk and limestone and in more acidic upland situations such as ghyll woodland. Ash supports a high number of species that exclusively or significantly depend on it as a host or food source.

- Woodlands and trees generally provide a range of services to us ('ecosystem services') valuable to our prosperity and wellbeing such as renewable energy, sustainable materials, recreation, landscape, clean water and flood alleviation, cultural heritage, carbon sequestration, and biodiversity. See Annex A for further details.

## Key Facts about Chalara

- Chalara dieback of ash is a disease of ash trees caused by the fungus *Chalara fraxinea*<sup>9</sup>. The disease causes loss of leaves, dieback of the crown of the tree, and can lead to tree death.<sup>10</sup>
- *Chalara fraxinea* has infected many species of ash, but with differing intensities<sup>11</sup>. As some ash species show very few symptoms after infection, they may act as undetected carriers.
- Common ash (*Fraxinus excelsior*) is the most severely affected species. Young trees are particularly vulnerable to *Chalara fraxinea* and succumb to disease rapidly.<sup>12</sup>
- Chalara has seriously affected a high percentage of ash trees in continental Europe.<sup>13</sup> There is no evidence that *Chalara fraxinea* can spread to tree species other than ash or that it is harmful to the health of people or animals.
- Infection is via spores from fruit bodies on leaf litter. Spore production (in fruit bodies) occurs on infected fallen leaves and shoot material in the growing season after infection; trees are likely to need a high dose of spores to become infected.<sup>14</sup>

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<sup>9</sup> Kowalski T (2006). *Chalara fraxinea* sp. nov. associated with dieback of ash (*Fraxinus excelsior*) in Poland. Forest Pathology 36, 264-270.

<sup>10</sup> Kowalski T and Holdenrieder O (2009). Pathogenicity of *Chalara fraxinea*. Forest Pathology 39, 1–7.

<sup>11</sup> Forest Research (2012). [Rapid assessment of the need for a detailed Pest Risk Analysis for Chalara fraxinea](#)

<sup>12</sup> Kowalski T (2006). *Chalara fraxinea* sp. nov. associated with dieback of ash (*Fraxinus excelsior*) in Poland. Forest Pathology 36, 264-270 Forest Research (2012). [Rapid assessment of the need for a detailed Pest Risk Analysis for Chalara fraxinea](#)

<sup>13</sup> Forest Research, 2012; Bakys et al., 2009; Engesser et al., 2009; Halmschlager and Kirisits, 2008; loos et al., 2009; Kowalski and Holdenrieder, 2008; Lygis et al., 2005; Ogris et al., 2010; Szabo, 2009; Talgo et al., 2009.

- *Chalara fraxinea* infection starts primarily on leaves and is progressive over time with dieback and stem lesions usually manifesting in the next growing season. Leaf symptoms can be detected within two months of infection (experience from Denmark). *Chalara fraxinea* causes infection from June – October, mainly in July – August<sup>15</sup> Moist conditions favour production of the fruiting bodies.
- Natural spread is by wind-blown spores (ascospores) from these fruiting bodies<sup>16</sup> Spread can also occur via the movement of infected material through trade.
- There is low probability of dispersal on clothing and footwear or via animals and birds. Transmission by routes other than wind and planting material are likely to pose a comparatively low risk, but the risk cannot be ruled out.
- The impact of *Chalara fraxinea* infection depends on tree age, location, weather conditions and presence of honey fungus (*Armillaria*) or opportunistic secondary pathogens. Trees in forests are more susceptible because of the greater prevalence of honey fungus. Trees cannot recover from infection, but larger trees can survive infection for a considerable time and some might not die.

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<sup>14</sup> Timmermann V, Børja I, Hietaka AM, Kirisits T and Solheim H (2011). Ash dieback: pathogen spread and diurnal patterns of ascospore dispersal, with special emphasis on Norway. EPPO Bulletin, 41: 14-20. doi: 10.1111/j.1365-2338.2010.02429.x

<sup>15</sup> Børja I, Hietaka AM, Kirisits T and Solheim H (2011). Ash dieback: pathogen spread and diurnal patterns of ascospore dispersal, with special emphasis on Norway. EPPO Bulletin, 41: 14-20. doi: 10.1111/j.1365-2338.2010.02429.x Kirisits T and Cech TL (2009). Zurücksterben der Esche in Österreich: Ursachen, Verlauf, Auswirkungen und mögliche Forstschutz- und Erhaltungsmaßnahmen. Kowalski T and Holdenrieder O (2009). Pathogenicity of *Chalara fraxinea*. Forest Pathology 39, 1–7.

<sup>16</sup> (Kowalski T (2006). *Chalara fraxinea* sp. nov. associated with dieback of ash (*Fraxinus excelsior*) in Poland. Forest Pathology 36, 264-270. Kirisits T and Cech TL (2009). Zurücksterben der Esche in Österreich: Ursachen, Verlauf, Auswirkungen und mögliche Forstschutz- und Erhaltungsmaßnahmen. Kowalski T and Holdenrieder O (2008). A new fungal disease of ash in Europe. Schweiz. Z. Forstwes 159, 45–50. Queloz V, Grünig CR, Berndt R, Kowalski T, Sieber TN and Holdenrieder O (2010). [Cryptic speciation in \*Hymenoscyphus albidus\*](#). Forest Pathology. doi: 10.1111/j.1439-0329.2010.00645.x.

# Improving our understanding of the disease

We have sought to increase our knowledge about the spread of Chalara based largely on experience in other European countries where, for the most part, no action has been attempted to slow it. In addition, the Government commissioned a team from the University of Cambridge to model the potential spread of Chalara, based on the latest evidence, and as a part of this to look at the impacts of any action which could be taken to slow the spread. In parallel, the surveillance exercise has continued to develop our understanding of the current prevalence of the disease in Great Britain both in established ash trees in the wider environment, and in younger newly planted trees. Collectively, this work is telling us:

- Our understanding of the biology and epidemiology of this disease is still evolving.
- If the climatic conditions are favourable, airborne Chalara spores can survive for days and travel tens of kilometres.
- Using the currently available science and technology, it will not be possible to eradicate Chalara.
- There is currently no known cure for the disease.
- Currently available fungicides are unlikely to be effective at eliminating Chalara from infected trees, although new products are being developed and tested.
- Established, mature ash trees that are infected with Chalara appear to take years to die, often from secondary infections. This may mean that the full impact of the disease is not seen for a number of years. Younger, recently planted trees that are infected succumb much more quickly.
- The value (environmental, social, and economic) of ash trees in Great Britain varies from region to region, and according to other factors such as proximity to towns and cities, and the habitat in which it is situated.
- Action to slow the spread of Chalara could bring benefits. If effective, it would allow for a more considered approach to managing the impact of the disease on our woods, rural and urban landscape.

## Modelling the impact of Chalara

This section summarises the modelling work undertaken by the University of Cambridge. The modelling work incorporates the most up-to-date data and knowledge of the pathogen and its dynamics available to date and the results produced reflect the best predictions that can be made at this time. The modelling results will be updated as extra information becomes available. The modelling involved work to:

- i. Ascertain the likelihood of airborne incursion from the continent;

- ii. Predict the spread within the UK; and,
- iii. Predict whether or not the spread and its impact will be similar across the UK.

It has been based on data from a number of sources including:

- Forestry Commission (FC) datasets and expert knowledge,
- Joint Nature Conservation Committee(JNCC) datasets and expert knowledge,
- Centre for Ecology and Hydrology (CEH) datasets,
- Defra expert knowledge; and,
- Specialist expert knowledge of Chalara in other European countries.

The modelling work to-date indicates that:

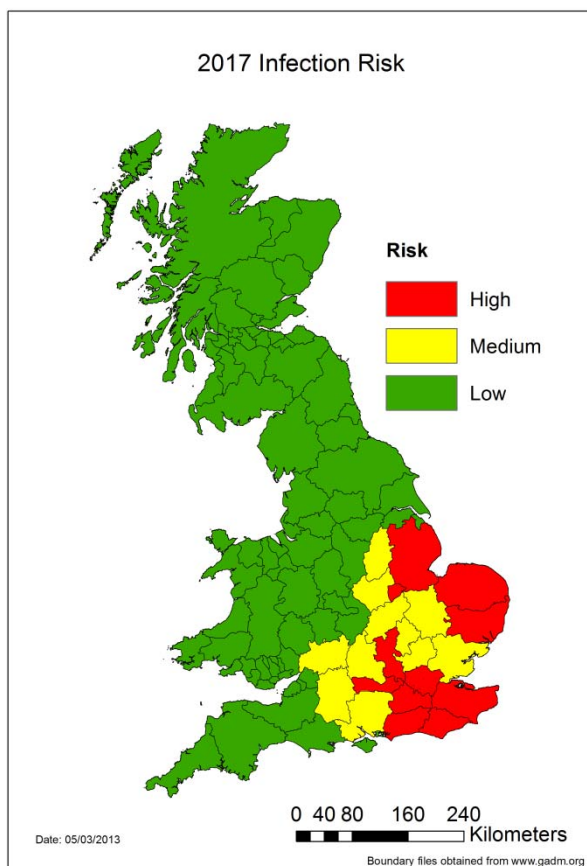
- Meteorological models strongly support the likelihood of airborne incursion - that is that the pathogen was carried by the wind across the Channel from Europe. Furthermore, the whole of the UK continues to be at risk from future airborne incursions either from continental or domestic sources of infection.
- The modelling work predicts that by 2017 there will continue to be regional differences in both the probability of disease presence and the extent of infection across the UK. The East and the South-East of England are predicted to experience the highest levels of infection with lower disease presence predicted in other regions.
- The model shows the probability of infection at any given location within the UK. In the absence of data for how infections develop over time on individual trees, it is not yet possible to incorporate predictions of symptom expression and the impact this will have on the landscape.
- In addition to the likelihood of individual locations becoming infected the modelling work can also predict the “hazard value” for a particular location. This is a measure of the importance of each site in terms of its impact on a future epidemic. The value of hazard at any location is a measure of the amount and value of ash that would become infected if that site were the focus of a new local epidemic. This means that each site in the UK can be categorised in terms of both its hazard and its risk and these two measures can be used to direct intervention efforts:
  - Intervention would be more cost-effective at a site with a high hazard value but which has a low risk of becoming infected. Tackling an infection here would have a large impact due to the high hazard value with a low probability of additional infections occurring.
  - Intervention would be less cost-effective at a site with a low hazard value and a high risk of becoming infected since any attempt to tackle new or existing

infections would be rapidly outweighed by the continual infection pressure from elsewhere.

- If recently planted sites are a major contributor to further disease spread then removal of these sites will delay the progress of the epidemic by up to three years nationally. There is considerable regional variation in this figure, with the Eastern and South-East regions experiencing delays of less than one year whereas the South-West and Scotland could experience delays of over three years.

The key outputs from the modelling are summarised below. A full report of the modelling work will be published, by the University of Cambridge in due course and will be available at <http://www.plantsci.cam.ac.uk/research/chrisgilligan.html>

### Map 1: Risk of Infection by 2017

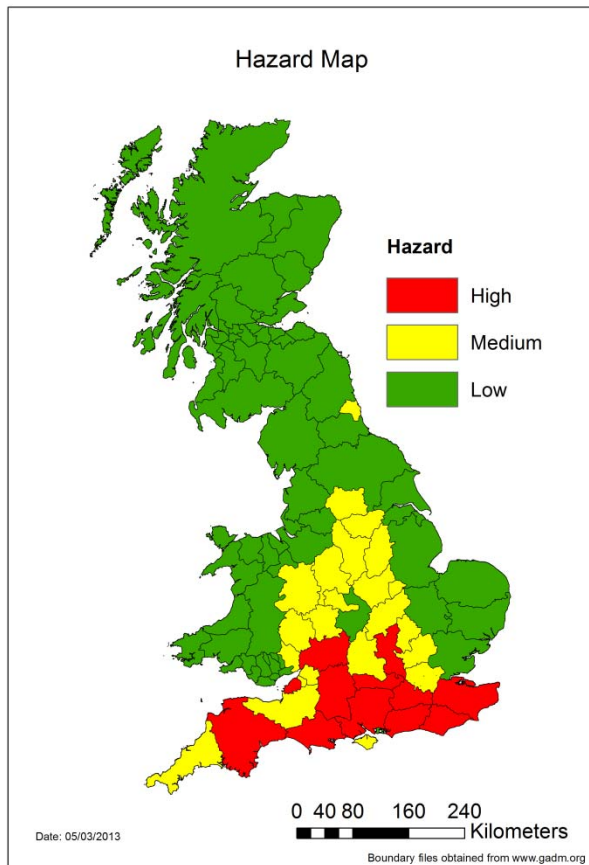


Map 1 is an output from the spread model for Chalara developed by the team at Cambridge University. It shows a prediction of the expected level of infected ash in each county in 2017 created by averaging results for each of the 250m x 250m squares used in the model. The infection risk is expressed in relative terms as high (red), medium (yellow) or low (green).

The majority of windborne spread is likely to take place near existing cases in the wider environment, and therefore the highest levels of infection will be concentrated in the easternmost counties of England. The map shows where infection is likely to be; this will

normally occur ahead of symptom expression because there is a lag, especially for older, larger trees, between infection and detection of symptoms.

## Map 2: Hazard from Infection

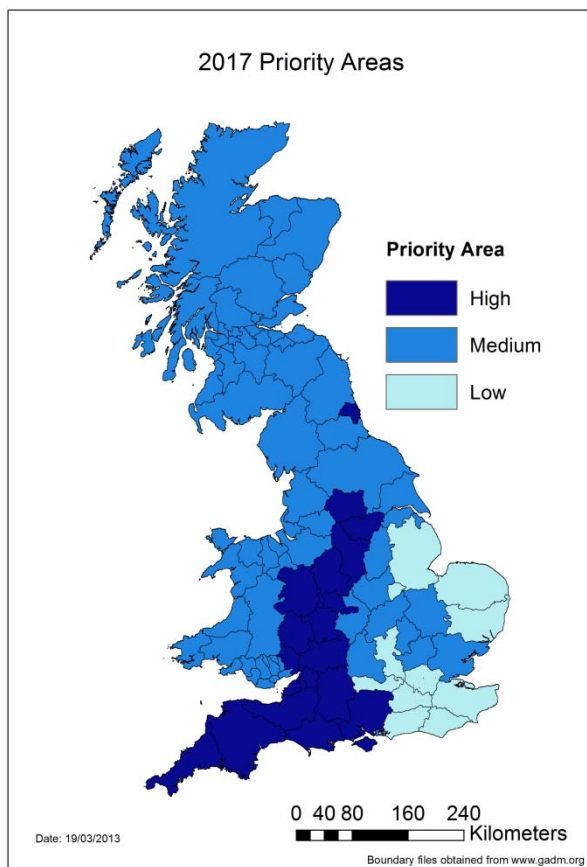


Map 2 is also an output from the Cambridge model and shows the relative hazard from Chalara to GB. The model calculates the area of ash that would become infected by an isolated new focus of infection in an otherwise completely uninfected region. This area is then weighted by an estimate of ash value for recreation, carbon sequestration, biodiversity and timber using data supplied by Defra and JNCC and weightings supplied by Defra. The size of the hazard from an infected focus depends on how much ash is present in the local region, and whether there are gaps in its distribution that are likely to delay spread. The hazard is averaged across each county and then expressed as high (red), medium (yellow) or low (green).

The hazard from new foci of infection is highest in south central England, where ash is most abundant and there are many possible routes of further local spread.



### Map 3: Priority areas



Map 3 combines the two Cambridge model outputs. Areas with a relatively low risk of windborne infection and a relatively high hazard value are shown in dark blue. These are areas where interventions, e.g. removing young infected plants, are most likely to be cost effective. Areas in pale blue are those where intervention is likely to be less cost effective, either because of the high risk that these areas will become infected anyway or because the ash that would be protected is of lower value. The medium priority zone comprises two distinct area categories: areas that have a low risk of infection and a low hazard value and also areas that have an intermediate level of risk and an intermediate hazard value. This priority map is already being used to focus the efforts of Defra and FC inspectors who are tracing deliveries of young ash trees over recent years and checking for signs of infection.

Details of how the modelling has been used to inform other management decisions are set out throughout the plan.



# The Government's objectives for responding to Chalara

The Government has updated the action that it is taking under each of the four objectives from its interim Control Plan following analysis of further scientific evidence and discussions with stakeholders.

## Objective 1 – Reducing the rate of spread

Even though there is currently no cure for Chalara, taking action now to reduce the spread could bring benefits. The University of Cambridge modelling work tells us that in much of England the effect of taking action to slow the spread of the disease, whilst relatively short-lived, might buy us important time to adapt. The Government - in consultation with stakeholders and the scientific community - has therefore considered what action might be most effective. In doing so, it has borne in mind that:

- The widespread felling of ash uninfected trees or mass leaf litter collection would have relatively little impact - these actions would be costly, potentially have adverse consequences for the environment, and are unlikely to have widespread support of land owners and woodland managers.
- There are trade-offs between taking action on Chalara and directing resources to monitor and protect Great Britain from: (i) other potential tree and plant health risks that are not yet prevalent; and (ii), taking action against other pests and diseases already present in the country where action may be more beneficial.
- Most of the sites of infection that have been found so far are in the South East of the country and there are likely to be benefits from slowing the progress of the disease as it moves further west across the country. This would allow a more considered approach to managing the impact of the disease on our woods, rural and urban landscape. It will allow time for commercially valuable ash, both high quality timber and woodfuel, to be brought to market at a rate that does not adversely affect prices or the supply chains' ability to absorb it. It will also allow time to further develop techniques to create more resilient woodland and to produce new stocks of trees.

Therefore, the Government will pursue a collaborative and largely voluntary approach to slowing the spread in England. In the first instance, we will support replanting with alternative species, and in higher priority areas identified in Map 3 above, removal and disposal of recently-planted infected ash trees. This will be possible where these were originally funded under the England Woodland Grant Scheme. We will also actively explore whether there is any capacity in the Higher Level Environmental Stewardship Scheme to do likewise and provide an update on this at the end of April 2013. More

details are set out under **Objective 4: Build Economic and Environmental Resilience in woodlands**, but the basic principles of the approach are summarised here:

- The Government and many stakeholders believe there is value in removing as many recently-planted ash trees (i.e. planted within approximately the last five years) as possible and replanting these with alternative species. This is a precautionary approach based on the probability that some of these younger ash trees are already infected, and the possibility that more will become infected within the next few years.
- The Government believes that, over time, landowners and woodland managers would generally wish to replace any young ash and that supporting replanting is a cost-effective way to achieve the objective of removing infected young ash and ensuring minimal loss of woodland cover.
- Therefore, in England, for sites where planting of ash woodland has been funded under the Rural Development Programme for England via the English Woodland Grant Scheme we will:
  - Provide grant aid to landowners to fund the removal and disposal of recently-planted infected trees in higher priority areas (as set out in Map 3 above). This is intended to help slow the spread of Chalara from those areas in the East of England, where it is well-established in the wider environment, to the west of the country.
  - Provide grant funding throughout England to support replanting of sites of recently-planted infected ash trees with other species. We would expect much of this replanting to be completed next winter wherever possible.
  - Actively explore a similar approach for ash trees planted under Higher Level Stewardship, to further our strategy of focussing our resources on securing those woodlands already funded by Defra.
- The FC will provide guidance on cost-effective options for removal, disposal and replanting by the end of April 2013. The Government will work with the nursery sector, and land owners, to consider the implications of replanting on the demand for, and sourcing of other species.
- The FC will issue guidance, based on the latest scientific evidence, on how to protect the environmental, amenity and economic value of ash trees, and to encourage interested parties to develop collaborative approaches in local areas.
- The Government will not, in general, be encouraging the felling of mature ash trees in either urban or rural situations, as part of the action to slow the rate of spread as it is not easy to predict whether, or how long, such trees will survive. The retention of mature trees also maximises the potential for regeneration of a new population of disease resistant trees. This does not however interfere with owners' normal rights to fell subject to a Felling Licence or Tree Preservation Order approval.

- Any removal of mature uninfected ash should be phased to ensure, it is retained for as long as possible, particularly at high value sites, as this would have the potential to reduce its timber value and have a disruptive effect on landscape, wildlife and woodland habitats.

The Government wishes to avoid statutory action if possible. However, there may be situations where, to protect sites of particular value, Government would wish to take additional action beyond a purely voluntary approach to mandate the removal of infected young or old ash trees, or associated leaf litter. This could be for a number of reasons, for example:

- A newly planted source of infection is at risk of spreading to the wider environment in an area where the disease is not yet present.
- An isolated wider environment site is a risk to an otherwise uninfected area.

If land owners and bodies such as local authorities, the Highways Agency or Network Rail believe infected trees on their property are a health and safety risk then they will be responsible for them as for any other diseased tree.

## **Review the restrictions on import and movement of ash trees by Spring 2013**

The interim Chalara Control Plan set out that the current restrictions on the movement of ash trees would remain in place and the Government committed to review this by spring 2013. The restrictions were originally imposed to prevent, as far as possible, the disease entering and spreading within Great Britain, and to provide the opportunity to identify disease free areas from which plants could be safely moved. The evidence from the survey and the modelling is that it is unlikely to be possible to demarcate disease free areas within England. Given that Chalara cannot be eradicated, the Government believes that planting of new ash should be discouraged and freeing up the movement of ash now is not consistent with this objective.

Therefore, whilst our understanding of the disease continues to develop the Government believes that movement restrictions should remain in place for the time being. However, this will be kept under review over the coming months. The movement ban does not currently include the movement of ash timber, including firewood, as the Government does not believe this poses a significant additional risk.

## **Surveillance and the trace forward exercise**

### **The current trace forward exercise**

In the interim Chalara Control Plan, the Government set out its intention to continue with the exercise to trace sites which may contain recently planted trees (one to five year-old

plantings) from an infected source and review this approach in spring 2013 in light of further scientific research. The trace forward exercise has been successful in helping to build a more accurate picture of the extent of infection in Great Britain but, given the understanding we have now of the prevalence of the disease, tracing forward across all parts of Great Britain is unlikely to be an effective use of resources. It is likely that data on the disease which will come through other routes, such as reporting by landowners, forest managers and the general public will be a more cost-effective way of keeping a reasonably accurate and up-to-date picture of the spread of the disease.

Therefore, trace forward activity will be focussed on areas we believe the removal of newly planted ash trees will deliver the most benefit i.e. where the likelihood of airborne infection is relatively small, but the potential impact of the disease could be high. The inspection of known sites in higher priority areas (as set out in Map 3 above) will have been completed by the end of July 2013.

## Protected zones

The interim Chalara Control Plan said that the Government would consider the feasibility of protected zones, and whether some areas of the country could be designated as 'disease-free'. Based on our understanding of the current levels of infection and rate of spread, it may not be possible to designate disease-free areas or disease-free protected zones. The cost of designating and policing such areas could be high, with no guarantee of success, given the prevalence of the disease and its estimated rate of spread. However, it may be possible that a more targeted approach in the future could yield benefits and the Government will continue to consider the usefulness of this as our scientific understanding of the disease continues to evolve.

## Recording the progress of the disease

As ash trees start to come into leaf over the next few months, it is likely that current infections will become more visible. The FC and the Food and Environment Research Agency (Fera) will keep surveillance and monitoring strategies under constant review. Improved survey techniques will be explored and developed including:

- Lower-cost aerial surveillance;
- Rapid field diagnostic techniques such as Genie machines; and
- Spore trapping.

Reports from landowners and land managers will also help us gain a clearer picture of the current extent and impact of the disease. The aim will be for reports to be made in a standard electronic format using high quality digital photographs e.g. via Tree Alert <http://www.forestry.gov.uk/website/treedisease.nsf/TreeDiseaseReportWeb>

## Future research priorities

Research is being commissioned and other evidence sought as we continue to improve our understanding of Chalara, how it spreads, and how spread might be slowed and damage reduced. This research forms part of the overarching tree health and plant biosecurity evidence plan, also published today at

<http://www.defra.gov.uk/publications/2013/03/26/evidence-plans/>.

We are commissioning research to address specific questions about the biology and management of the disease. This will, for example, help to refine the epidemiological models that show how the disease may spread across the UK over the next few years as well as identifying if any specific management approaches can reduce the level of damage locally, e.g. by reducing the production of spores from overwintered leaf litter.

The modelling work has enabled the Government to determine how best to target any future tracing of recent plantings in areas of the country where new foci of infection are more likely to be damaging, and less likely to arise otherwise from windblown spores. The government will continue to fund refinements of the models in the light of new information on the spread of the pathogen and its biology.

One significant area of uncertainty is the level of risk posed by infected young trees. Some will die without spreading the disease. Others might grow infected leaves from the edge of stem lesions, or fruiting bodies may be formed direct from stem lesions, particularly if these end up on the ground. Some sites where infected young trees have been growing will be monitored to gain a picture of whether and how the disease develops there, and what proportion of infected young trees present a risk.

The Government will also investigate the use of DNA tests on filters from existing air quality and pollen monitoring networks to see if these can provide early warning of the presence of windblown Chalara spores. This approach, like other techniques being developed for Chalara, will also have potential for application to other plant diseases.

## Treatment and prevention

Whilst there is currently no cure for Chalara, there are practical actions that everyone can take and the Government remains open ideas for how the impact of Chalara can be tackled.

### Leaf litter

The main source of Chalara spores is from fruiting bodies produced on overwintered leaves and released in the summer months. Circumstantial evidence from the continent suggests that trees in a woodland environment suffer more disease than trees in streets or parkland. This may be in part because more spores are produced from an undisturbed layer of woodland leaf litter than from ground which is swept, mown or grazed. We will

work with landowners to identify possible sites where different approaches to management of leaf litter can be trialled and the speed and severity of damage from the disease compared.

## Treatments

Based on our experience of other tree diseases, on scientific advice on and other European countries' experience of Chalara, we are advised against expecting to find a treatment which can be widely applied to protect woodland or treat an infected wood or forest. Treatments may have a role, though, in protecting individual trees or groups of trees, or reducing production of spores, level of damage and rate of spread in some circumstances.

Fera pro-actively sought potential products and various different chemical treatments have been proposed by companies or individuals. Those which show the most promise from the evidence available are now subject to laboratory and field trials. If the trial results indicate that one or more of the treatments could form an effective means of protecting such trees, the potential for extending the authorisations for the product(s) to cover relevant environments such as amenity or forest trees will be determined in consultation with the Chemicals Regulation Directorate of the Health & Safety Executive which regulates pesticide approvals.

The treatments that have been submitted for scientific analysis are now being taken forward as a matter of urgency to the next stage which is laboratory testing. These are a mixture of products which may be effective on live trees and those which may be effective on leaf litter. These products need to be tested to ensure they do not adversely affect other wildlife or human health, and to ascertain how they might be used if appropriate.

The products that have been shortlisted by Fera for trials in 2013 and an explanation of how the products were selected can be found on the Fera website:

<http://www.fera.defra.gov.uk/plants/plantHealth/pestsDiseases/chalaraInfo.cfm>

## Objective 2 – Developing resistance to the disease in the ash population

Our best hope of securing the future of the ash tree in Britain lies with understanding its genetic variability, identifying resistance to Chalara and facilitating the spread of that resistance sustainably in our ash populations.

To meet this objective, Defra, with other funding partners including the FC and the research councils (Biotechnology and Biological Sciences Research Council and Natural Environment Research Council), will take forward a programme of research to identify and exploit resistance in UK ash trees. This will support longer-term selection and breeding to mitigate the impacts of Chalara and includes both cutting-edge genomic work and more practical field-based screening of ash material that utilises the widest possible range of genetic variability.

The programme of research brings together some of the UK's leading researchers on plant genomics, plant pathogen genomics, tree breeding and plant health from a number of universities, research institutes, government agencies and other groups, as well as expertise from Europe. It was developed with the input of experts from the UK and from other countries through various science meetings including a workshop on developing resistance convened by Defra's Chief Scientific Adviser, Professor Ian Boyd on 13 December 2012 and a FRAXBACK, European Chalara conference on 13-14 November 2012. The FRAXBACK conference brought together 150 European scientist, officials and stakeholders from 30 countries to discuss the health status of their ash, on-going research projects and significant results as well as research needs.

### Genomic research

Genomic research within the programme will aim to provide robust molecular markers for accelerated selection of resistant UK ash genotypes and advance our understanding of the nature of the fungus.

Genetic data from Danish ash trees which have shown some resistance to the fungus will be compared to that of susceptible trees to try and find differences in their genetic codes. By identifying these differences, it is hoped that we will be able to develop genetic markers (or known sequences of DNA) that are associated with resistance to the disease. We can use this knowledge to help UK breeders produce resistant ash trees more quickly. Researchers also plan to unravel the DNA of the fungus to try to understand how it developed and how it spreads and causes disease.

Funding has been awarded to the Nornex consortium that brings together tree health and forestry specialists with scientists working with state-of-the-art genetic sequencing, biological data and imaging technologies to investigate the molecular and cellular basis of interactions between the fungus and ash trees. More information on this work is available

at: <http://www.bbsrc.ac.uk/news/fundamental-bioscience/2013/130308-pr-bioscience-to-battle-ash-dieback.aspx>.

## Field-based screening

Alongside this technology-driven approach, and as an urgent first step, we have commissioned practical field-based work to identify ash trees of UK provenance which are less affected by the disease and we will invest up to £350,000 this financial year to prepare and plant trial sites across Norfolk, Suffolk, Essex and Kent. A number of separate sites are being sought in affected areas, particularly in Norfolk and Suffolk, to maximise the likelihood of the disease becoming apparent in at least some of these sites during 2013. Sites are being made available by the FC, private landowners and landowning charities.

Ash trees of wider European provenance will also be screened as appropriate. If similar results to trials in other countries are seen, one percent of the trees are expected to display tolerance to the fungus and these will be subject to further breeding work and linked to work on genetic screening for resistance markers.



## **Objective 3 – Encouraging citizen, landowner and industry engagement in surveillance, monitoring and action in tackling the problem**

The public response to the threat posed by Chalara has provided a vivid demonstration of just how valued the British ash tree is by woodland and individual tree owners and growers, managers, conservation organisations and members of the public. The Government is committed to tackling the disease through a collaborative approach with stakeholders, and this management plan has benefited from the engagement and expertise of many of them.

Some recent examples demonstrate the commitment to continued voluntary support by stakeholders, which the Government is pleased to acknowledge:

- The rapid and generous response to a request for sites to plant trials of ash to test for natural resistance.
- The time devoted to developing this plan and helping to guide the work of ongoing management.
- The stakeholder response to the unprecedented national survey of ash woodlands in 2012.
- The time and expertise provided by scientists and professionals in helping to develop practical advice and guidance based on sound evidence.
- The interest and commitment shown by members of the public in reporting possible findings of Chalara through TreeAlert and the AshTag apps.
- The 97% response to a survey of officers from 105 of The Tree Council's relevant member organisations, carried out in late February 2013 by The Tree Council, on the impact of Chalara.

### **Advice & guidance**

Details of guidance and advice published to support the December 2012 Control Plan are set out in Annex B. The FC is reviewing its guidance in light of this Management Plan. In particular, they will be filming the spring signs of Chalara when trees come into leaf. This will be available online to help with the identification of the disease. In the meantime, woodland managers, land owners and other interested parties may wish to note the latest position on various aspects of the package of Government advice and guidance:

- There is likely to be a number of years between signs of Chalara ash dieback appearing on a tree and timber quality starting to deteriorate. Further information will be gathered on this question from experience in other countries, and from

observations in woods in the easternmost counties of England where infection has been present for longest.

- Research will be undertaken to check on the efficacy of composting in reducing the risk of Chalara spreading with leaves being moved. This research will be based on techniques and protocols used by local authorities and others disposing of large quantities of leaves in areas affected by the disease.

Some of the general guidance on good silvicultural practice will be relevant to those looking to secure the long-term resilience of woods and forests in the face of Chalara.

## Citizen engagement

Citizen science is an important part of the response to Chalara and good progress has been made on many of the actions aimed at encouraging citizens, landowners and industry to engage with surveillance, monitoring and action. These include:

- A Defra-funded feasibility study that is already providing evidence to accelerate the development of ObservaTREE, a tree health early warning system using volunteer groups.
- The development of a proposal for an interactive web-based mapping application which will allow the public to explore maps showing the distribution of our woodland areas and native ash population against the extent of known disease.
- The OPAL Tree Health Survey that will provide the public in England, Wales and Scotland with the opportunity to monitor for Chalara.
- Fera is leading the creation of a bio-security-themed show garden at the centenary RHS Chelsea Flower that will highlight the issue of tree health.
- A web-based recording form for volunteer naturalists developed by JNCC and CEH to assist in monitoring the biodiversity impacts of Chalara.

## ObservaTREE & Plant Health Network

Defra has funded a feasibility study to accelerate development of ObservaTREE, a tree health early warning system using volunteer groups. Under test in the feasibility study are: development and training of a volunteer network (led by Woodland Trust and National Trust), deployment of the latest in DNA diagnostic technology (“Genie” machines) to specialist volunteers (led by Fera) and a workshop to scope the needs of supporting information databases, interactive mapping and smartphone Apps (led by Forest Research and the Woodland Trust).

In December 2012, Fera also completed a series of four “train the trainers” workshops to develop tree health and biosecurity expertise within the garden sector, including the

National Trust, Royal Horticultural Society, National Trust Scotland, Royal Botanic Gardens Kew and Edinburgh and the Field Studies Council.

## **Chelsea Show Garden - May 2013**

Good progress has been made on development the biosecurity-themed show “Stop the Spread”. The garden’s unique, visually striking and thought-provoking design is aimed at raising awareness of the threat to British trees and plants from pests, diseases and invasive non-native species, and to inspire the public to play their part in preventing the spread of harmful pests, diseases and invasive non-native species from their gardens to woodlands and the countryside.

In addition to the financial support from Government, others including the Devolved Administrations, the National Trust, Woodland Trust, the Horticultural Trades Association and The Tree Council are all supporting communications on the garden.

## **OPAL**

The OPAL consortium, Fera, Defra and Forest Research are on course to launch the Tree Health Survey in May 2013. Included in the survey is an activity for participants to report suspect sightings of Chalara along with other high risk pests threatening the nation’s trees (emerald ash borer, citrus long-horned beetle, Asian long-horned beetle, oak processionary moth and pine processionary moth). It has now been confirmed that the survey will be extended from England to Wales and Scotland.

## **Industry led Charter Mark**

We will continue to support some initial work by industry stakeholders on an industry-led charter mark to scope the feasibility of providing consumers with provenance information for trees and plants of UK origin.

## **Volunteer naturalist recording of species impacts**

A web-based recording form for species associated with ash trees has been produced by JNCC and CEH, which is linked to other data systems such as the National Biodiversity Network <http://www.nbn.org.uk>. Research into how best to structure the monitoring of Chalara impacts will be completed in the next month, and this will be used to further develop the recording form to be ready for the main species recording season.

Noteworthy in all the initiatives above has been the positive and proactive involvement of a wide range of industry and non-government organisations, who have taken the lead on a number of projects. The work of just a few of these organisations is set out below.

- **Country, Land and Business Association (CLA)** members took part in the rapid response survey and CLA staff have contributed to the production of this management plan. The CLA is running regional workshops for members on woodland management, tree pests and diseases and tree safety and will continue to run these and workshops on adapting woodland to climate change as our understanding of the issues develops.
- The **Horticultural Trades Association** is organising an industry conference “UK Plant Biosecurity Seminar - Preparing for the threats of tomorrow” for 30 May 2013.
- **The Tree Council** has galvanised its national network of 8000 community based Tree Warden volunteers to look for the disease and report any sightings. It produced the first comprehensive photo-ID guide to the winter signs, which was widely circulated and has been at the forefront of efforts to spot infected sites in the wider environment. It continues to champion the exploration of the management issues for non-woodland trees on behalf of its 180 member organisations, work with transport infrastructure organisation to understand the issues that will affect our roads and railways and discuss Chalara with its partner European tree organisations, to better understand the problems caused by the disease in Europe, and the effectiveness of their response to it.
- **The National Trust** has formed a group of trained staff that can support properties on Chalara issues, and also engage with plant health authorities and other organisations on a local level. All significant young plantings of ash have been inspected and will continue to be monitored. Staff will receive training on the new Genie diagnostic machine and will then be able to conduct field diagnostic tests. The Trust is focusing renewed effort on improving the conditions in which any of its ancient ash are growing, with the aim of enhancing their resilience to future secondary infections. The Trust has offered the use of its state-of-the-art Plant Conservation Centre to store genetic material and breed resistant trees. It will work closely with its suppliers to develop much more robust purchasing protocols for all trees and plants. It will continue to engage the public in opportunities to become involved in initiatives such as the current ObservaTree and Opal projects.
- **The Woodland Trust** published a three point plan last October in response to Chalara and tree diseases more generally which committed it to: i) to accelerate the search for funds and the delivery of the ObservaTREE project ii) to work much more collaboratively with tree nurseries on issues such as forward planning of tree supply and provenance and iii) host a scientific conference on developing conservation impacts and responses to Chalara and to other tree disease for native woodland at a central London location in June 2013. In addition to this the Trust has offered some of its own sites for controlled planting trials of native ash provenance. It is also using its many communications channels to increase information to its supporters around the consequences of tree disease and to promote opportunities for supporters and the public to become involved. The Trust will be working with its expert recorders and the Ancient Tree Forum to

monitor the health and status of almost 6000 ancient ash trees recorded on the UK wide Ancient Tree Hunt database ([www.ancienttreehunt.org.uk](http://www.ancienttreehunt.org.uk)) over the coming months and years to see how they respond, if they become infected and whether they hold potential for resistance to the disease.

- **Confor** has recently published a major new report which highlights the importance of government support for the private forestry sector to respond to tree disease. Around 97% of woodland ash and 61% of pine (Corsican, lodgepole and Scots) is in non-state ownership. The report, commissioned by Confor, considers the potential financial and other impacts of these two important tree diseases, with context, costs, benefits and recommended actions. It is available at <http://www.confor.org.uk>

The Government is particularly grateful to these stakeholders for their advice as it has developed this version of the Chalara Management Plan.

## **Objective 4 – Build economic and environmental resilience in woodlands and in associated industries.**

Great Britain's trees, woods, forests, hedgerows and landscapes are a vital national asset providing multiple economic, social and environmental benefits. The Government's objective in responding to Chalara is to ensure that this asset is protected, managed and enhanced so that these benefits can be both maximised now and realised in our future. When building resilience we will take account of principles Sir John Lawton set out in his report Making Space for Nature:

<http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf>.

### **Supporting forest managers and their supply chains**

Land owners, forest and woodlands managers and the nurseries that supply them, all have an interest in ensuring that forests and woodlands continue to thrive. As the UK adapts to Chalara, this will mean re-planting or encouraging natural regeneration with different species and in the first instance to replace infected young ash trees.

The interim Control Plan said that Government would conduct a review of policy measures that influence forest planting grants and planting decisions to identify mechanisms that minimise threats from imported plant material and maximises opportunities for stock to be grown domestically. In the longer term, this will mean exploring the scope as part of current negotiations of the future Common Agricultural Programme for the next Rural Development Programme to support action which promotes tree health. However, we have also looked at how the grant system might be used to support the resilience of woodlands and the supply chain for the rest of the current Rural Development Programme (RDPE), which runs until the end of December 2013.

The FC and NE have published information [here](#) to grants customers outlining what they need to do to comply with grant conditions where trees planted under the England Woodland Grant Scheme have become infected with Chalara. When landowners become aware of the disease they need to notify the FC. The aim will be to agree a remediation plan which, where appropriate this may be eligible for further funding. The FC will agree alternative species on a case-by-case basis. Where ash is only a small component of the scheme, or if it is impractical to take any remedial action, it may be acceptable not to plant any replacement trees.

We will also explore whether the Higher Level Environmental Stewardship Scheme in the current Rural Development programme period can be used to fund this work and will provide an update on this work in April 2013.

## Removal and replanting

As set out above, the FC will develop options to fund removal of recently planted infected ash trees and replanting of alternate species for those sites recently planted under the English Woodland Grant Scheme. The aim is to improve the resilience of these young woodlands and to secure the future of sites already funded by the Government. For simplicity, funding will be applied via amendments to existing agreements. It is intended to have systems operational and guidance for agreement holders available by the end of April 2013. Appropriate actions will be funded from existing RDPE budgets.

This will allow time for commercially valuable ash both high quality timber and woodfuel- to be brought to market at a rate that does not adversely affect prices or the supply chains ability to absorb it. The Devolved Administrations will be considering what support measures might be appropriate in their circumstances.

## Amenity suppliers

There are other vital parts of the supply chain for ash (and other trees). Amenity suppliers, usually nurseries, supply trees to a variety to locations and often as a part of critical public sector projects, for example the Olympic Parks, from which society as a whole often derives benefit. Rather than young seedlings destined for forests, these suppliers grow larger, more mature trees that require significant investment. Where this investment has been made, nurseries have told us that they currently have large ash trees in containers or in the ground, which they cannot move and for which there may no longer be a market. The Government will continue to work with this sector to explore how the impact of Chalara on these businesses can be minimised before the 2013/14 movement and planting season.

## Wider economic impact

Ash trees feature along transport routes and this means that those infected with Chalara could, in the future, become a safety hazard. Over a number of years, it is likely that some infected mature ash trees in locations where they pose a danger to the public will have to be removed. The Government will continue to work with public and private land owners to understand the implications of this.

## Environmental resilience

Chalara has the potential, over a number of years, to have considerable impact on the natural environment. In addition to the action being taken under other objectives in this plan, the following will be taken into account as we continue to take action to build environmental resilience to the disease.

- The JNCC has commissioned research on the impact on species that depend on ash, and also the ecological responses to a range of management scenarios in responding to Chalara. The final report is due in April 2013. This work should provide a clearer picture of the ecological impact of Chalara and will allow policymakers and land/forest owners to better understand the likely effect of different pressures on tree health, and how management can improve the resilience of ecosystems. It will also provide information on whether alternative tree species could provide similar ecological functions to ash.
- There are actions that woodland/non-woodland managers can take to build resilience, which will need to be borne in mind as ash is gradually replanted with other species, for example to create greater diversity of species, age class and structure. This should happen at both a woodland and a landscape level so that there is diversity across the country. Managing the impact of animals such as deer and squirrels on the natural regeneration of trees (and other plants) is also vital and work on the latter is underway on the former through the Deer Initiative <http://www.thedeerinitiative.co.uk/>
- The protection of ancient and veteran trees is particularly important, because of their high environmental and landscape value and the fact that they cannot easily be replaced. Ancient trees are important in their own right but also as a potential source of resistant material. Both the Woodland Trust and The Tree Council have worked with the Ancient Tree Forum to produce guidance on managing ancient and veteran trees available at <http://www.woodlandtrust.org.uk/en/about-us/publications/Pages/ours.aspx>.
- Also from March 2013, 'Ancient and other Veteran Trees: Further Guidance on Management' available at [www.treecouncil.org.uk](http://www.treecouncil.org.uk).
- There is currently no need to fell veteran, ancient, or mature ash trees as a result of them becoming infected with Chalara as they could take many years to die. Dead and decaying wood is also beneficial for some wildlife species that depend on ash. Veteran, ancient mature trees are also important components of a resilient woodland or landscape. They will also provide potential for resistant regeneration. For guidance on management please see Common Sense Risk Management of Trees Guidance [http://www.forestry.gov.uk/pdf/FCMS024.pdf/\\$file/FCMS024.pdf](http://www.forestry.gov.uk/pdf/FCMS024.pdf/$file/FCMS024.pdf)
- Further work is needed to understand the impact of the disease on non-woodland and hedgerow trees of which ash is often a major component. As part of this we will work with the relevant stakeholders, including Network Rail and the Highways Agency to better understand the impacts, and costs of the diseases. In the meantime, if infected trees pose a health and safety risk utility infrastructure operators and local authorities will manage this risk using usual tree safety procedures.



## Next steps

### Chalara

The Government will publish a revised version of this Management Plan no later than the end of March 2014. This will focus in particular on non-woodland trees and further proposals to build long-term resilience to Chalara. In the meantime, as our understanding of the disease develops, will keep its approach under review and continue to work closely with stakeholders. Updated advice will be published as it become available on the FC website.

### Wider plant health policy

The Government awaits the final report of the independent Tree Health and Plant Biosecurity Expert Taskforce.

This was convened in November 2012 at the request of the Secretary of State for Environment, Food and Rural Affairs. The Taskforce was created to advise the Government on the current threats from pests and pathogens, and to make recommendations about how these threats to trees could be addressed. It brought together a number of academics, both national and international, to advise on the current threats to tree health and plant biosecurity in the UK and make recommendations about how those threats could be addressed. The Taskforce published an interim report which made some initial recommendations to Government in December 2012 which is available at <http://www.defra.gov.uk/publications/2012/12/06/pb13842-tree-taskforce-interim/>

Following further work, the Taskforce will produce a final report addressing all of its aims in May 2013. This is expected to review the national and international risks and the evidential basis for the effectiveness of response options, develop work to provide an independent perspective on costs and benefits to inform setting priorities and resource allocation around tree and plant health and to review international practice in tree health and plant biosecurity management. The Government will respond to the Taskforce's final report later in 2013.

# Annex A: Characteristics and benefits of woodlands and ash in the UK

## Woodlands in the UK

In the UK, trees and woodlands provide a wide range of ecosystem services valuable to the economy and societal well-being. These include “provisioning” services involving the production of timber as a commercial activity.

The total UK forestry and logging sector, including support services, directly employed around 14,000 people in 2010, in more than 3,000 separate enterprises. The Gross Value Added (GVA) for this sector was £385 million in 2011 and for sawmilling was £433 million<sup>17</sup>.

Woodlands deliver a number of other ecosystems services that generate wider public goods and services. They are a valuable and often iconic component of our landscapes and an important part of cultural identity and cultural heritage. Their importance is reflected in the number of visits made to woodlands – in 2011 in England 358 million visits were made to woodlands (based on Monitor of Engagement with the Natural Environment), 65 million visits were made in Scotland (based on Scottish Recreation Survey and 86 million in Wales (based on Welsh Outdoor Recreation Survey)<sup>18</sup>. Other environmental benefits include valuable habitats for wildlife and biodiversity, contributing to absorption of air pollution and sequestering carbon.

The total societal and environmental value of woodlands is several times higher than the commercial value of the forestry and logging sector. These societal benefits are estimated at around £1.8 billion per year (2012 prices)<sup>19</sup> but it is recognised that there are further benefits that cannot readily be monetised.

## Ash trees in the UK

Ash trees in woodlands of half a hectare or more in size cover 141,600 hectares in Great Britain (5.4% of total woodland) and 110,000 hectares in England (9.2% of total woodland)<sup>20</sup>. In addition to this there is a further 39,000 hectares of ash in Great Britain’s woodland of less than half a hectare (32,100 hectares in England)<sup>21</sup>.

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<sup>17</sup> ONS (2012) Annual Business Survey

<sup>18</sup> As cited by Forestry Commission Forestry Statistics 2012 - Recreation

<sup>19</sup> Willis et al (2003) The Social and Environmental Benefits of Forests in Great Britain

<sup>20</sup> Forestry Commission (2012) National Forest Inventory: Preliminary estimates of quantities of broadleaved species in British woodlands, with special focus on ash

<sup>21</sup> Centre for Ecology and Hydrology (2013) Countryside Survey: Distribution of ash trees (*Fraxinus excelsior*) in Countryside Survey data

Ash timber is one of the most valuable native hardwoods, with a variety of high value uses. It is estimated to be 15% (22 million tonnes) of the standing UK hardwood resource stock<sup>22</sup>. Britain is one of the larger producers of high quality ash timber in Europe. The low moisture content of ash has always made it the most sought after firewood, and with the recent upsurge in usage of fuel-wood this is an important market for lower grades of ash wood.

Ash is a common native tree species occurring throughout many of our woodlands, wood-pastures and parklands, and supports a high number of species that exclusively or significantly depend on it as a host or food source. Ancient and veteran ash trees occur within woods, as well as agricultural, parkland and urban landscapes. Ash is also one of the most common hedgerow and field boundary trees, important for ecological connectivity between semi natural habitats. Ash forms a major component of 665 Sites of Special Scientific Interest (SSSI) in England and is also an important component of many other sites of high environmental value<sup>23</sup>. The upland mixed ash woods of the limestone of the Derbyshire Dales in particular are a priority habitat in a European context.

Ash coverage is most prevalent in the South East of England (in particular West Sussex and Hampshire) and in Herefordshire and Worcestershire. The highest percentage of ash in broadleaved woodland is in a belt through the midlands from Gloucestershire to Lincolnshire.

## The Value of Ash

Estimating the proportion of the commercial and societal value of trees and woodlands that can be attributed specifically to ash is difficult. Its contribution will depend on a number of factors which will vary significantly by region. A broad estimate can be made at a national level based on the proportion of all woodlands, by area, that is made up of ash trees.

According to the Forestry Commission around 20-30% of ash woodland is actively managed for timber, representing 1-2% of total Great Britain woodland. In 2011 an estimated 541,000 green tonnes of hardwood were harvested from UK woodlands. Most of this is used as fuel wood with the remainder either going to sawmills or other uses<sup>24</sup>.

The supply chain for ash saplings and more mature amenity trees is complex, involving nurseries, woodland managers, saw-millers, retailers and landscapers. There are estimated to be 60-80 enterprises in the UK nursery sector dealing in ash<sup>25</sup>. The HTA estimated that the current stock of ash trees held by these nurseries has a value of £2-2.5 million with the majority of this stock consisting of 1-2 year seedlings. However, some nurseries are destroying their ash stocks with the majority expecting reduced business profitability.

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<sup>22</sup> Confor

<sup>23</sup> Joint Nature Conservation Committee

<sup>24</sup> Forestry Commission *Forestry Statistics 2012*

<sup>25</sup> Horticultural Trades Association (2012) Impact of *Chalara fraxinea* on UK ash tree growers

Approximately half of ash saplings and young trees planted in the UK are imported. The annual value to UK importers of trading young ash trees is tentatively estimated at up to £300,000<sup>26</sup>.

Based on the available data, the Gross Value Added of the ash component of tree-related activity (nurseries, timber, and firewood) is £22 million per year<sup>27</sup>.

## **Wider social and environmental value**

Based on the most relevant and up-to-date research the best estimate currently available for the total value of the social and environmental benefits of ash is in a range between £72 million and £124 million per year<sup>28</sup>.

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<sup>26</sup> Estimate based on tree numbers from the Forestry Commission and the industry

<sup>27</sup> Defra *Ash-tree dieback: A framework for assessing ecosystem impacts and appraising options* (to be published)

<sup>28</sup> Ibid

## Annex B: Advice and guidance

- Practical advice has been published on slowing the impact of the disease for anybody with a responsibility for the management of ash, whether in woodlands, parks and gardens, or individual trees <http://www.forestry.gov.uk/forestry/INFD-92PJKX>
- Detailed advice to local authorities on the disposal and composting of ash leaves and saplings has been developed in consultation with the Environment Agency, the Food and Environment Research Agency and the Forestry Commission <http://www.forestry.gov.uk/forestry/infd-92gjvb>
- Chalara signs for woodland visitors have been published in downloadable form on the Forestry Commission website, for use in affected areas and also more general use <http://www.forestry.gov.uk/forestry/infd-8zklv5>
- The Highways Agency and Network Rail have worked closely with the Forestry Commission to develop guidance for staff working on their networks about handling and disposal of ash material. <http://www.dft.gov.uk/ha/standards/ians/pdfs/ian172.pdf>
- We have provided advice for a National Trust-funded poster on general plant biosecurity for those who work in forests and woodlands. [http://www.forestry.gov.uk/pdf/Poster\\_Forestry\\_Biosecurity\\_2013.pdf/\\$FILE/Poster\\_Forestry\\_Biosecurity\\_2013.pdf](http://www.forestry.gov.uk/pdf/Poster_Forestry_Biosecurity_2013.pdf/$FILE/Poster_Forestry_Biosecurity_2013.pdf)
- We have published advice on taking simple biosecurity measures which can help to prevent spreading tree diseases <http://www.forestry.gov.uk/forestry/INFD-8ZJMQ4bn>
- The Forestry Commission has developed a web based Tree alert form and a Tree alert app that can be downloaded onto smartphones or tablets to facilitate the reporting of potential outbreaks of the disease. <http://www.forestry.gov.uk/website/treedisease.nsf/TreeDiseaseReportWeb#>
- The Forestry Commission has produced a winter symptoms video and a spring version will be filmed when leaves appear. <http://www.youtube.com/watch?v=8sl7hgFZ-4g&feature=youtu.be>