Devon ash dieback action plan

An overarching plan to identify and address the risks of ash dieback disease in Devon

February 2016

Dead ash tree, affected by ash dieback disease, Suffolk, 2014. There are nearly half a million ash trees alongside Devon's roads.

1. Summary

1.1. Ash dieback disease, commonly known as Chalara ash dieback, is a major risk to Devon's landscape, biodiversity, roads and cable-based communication networks. Based on experience from other northern European countries and from Kent and East Anglia, it is prudent to assume that the disease will affect most ash trees in Devon. The levels of mortality and severe damage that will result are matters of considerable uncertainty but are likely to be very high in woodland situations and high in non-woodland ones.

1.2. This action plan is designed to identify the public safety, economic and environmental risks posed by the disease, and what needs to be done to address them, across all sectors. Its purpose is to generate high level understanding of the disease, and cooperation in responding to it. More detailed plans addressing specific aspects are likely to be necessary.

1.3. The disease could potentially cost millions of pounds to deal with in Devon. This action plan has been prepared to help ensure that the county is ready and adequately resourced both to respond to the immediate effects of the disease and to minimise long term adverse impacts through promoting resilience. During the next 5 to 15 years the disease is likely to become prevalent across most of the county and we should use this time wisely.

1.4. 36 actions are identified as desirable if Devon is to be adequately prepared for the disease. These actions are grouped according to priority and immediacy of risk, as follows:

1. Plan delivery, communication and strategic planning
2. Short term risks, to public safety and communication networks
3. Longer term risks, to the environment
4. Survey and monitoring, and biosecurity
5. Training
6. Regulation
7. Wood-based businesses.

1.5. Ash is an abundant tree in Devon. Best available figures suggest there are at least 1.9 million full grown or nearly mature ash trees outside woodlands in the county: ash is our second most numerous hedgerow tree. Ash dominated woodland covers about 11,000 ha, 22% of all broadleaved woodland. Ash is also frequent within urban areas – Torbay, for example, has an estimated 95,000 trees.

1.6. The current consensus is that over 90% of ash trees will die or be severely affected within woodlands. The impact of the disease in non-woodland situations is far less certain, being dependent on a range of factors including the density of trees, their age, genetic variability and climatic conditions. In a worse case situation, over 90% of non-woodland trees may be severely affected over the next 5 to 15 years to the extent that they will at least shed large limbs. The current majority view is that it is more likely that some 50% of non-woodland trees will be damaged to this extent over the same time period.

1.7. Major resource implications follow from the necessity to make safe those ash trees close to roads, public rights of way, public spaces, railways, and telephone and electricity cables. It is estimated that there are 448,000 ash trees beside Devon's 13,000km of public roads. 99% of these trees are the responsibility of private landowners. The cost to these landowners over the next decade or two (depending on the severity of the disease and the rate with which it spreads) could potentially be as high as £160 million. Farmers and others

are advised to start to plan now for increased tree safety expenditure, with support from public and private sector organisations.

1.8. The impact of the disease on landscape character may be high. While the impact on woodlands may not be apparent from afar, any loss or decline of ash trees from hedges and other woody linear features will be obvious across farmed landscapes.

1.9. While few animal and plant species are at risk of extinction within the county because of the disease, the populations of many are likely to be reduced. Little can be done to prevent the loss of ash trees themselves, although biosecurity measures may reduce the rate with which the disease spreads, especially in urban environments.

1.10. If action starts **now** to encourage the growth of replacement trees of a number of different species, then there is the chance of substantially mitigating the impact of the disease on landscape and biodiversity through improving resilience. Proactive planning is needed if the county is to manage the disease well and prevent it becoming a crisis.

1.11. On a positive note, the large quantities of dead and dying ash, prime firewood, may be used to kick start farm and other enterprises to supply woodfuel to their local communities. The disease may provide a rare opportunity to improve the health of both hedges and broadleaved woods through encouraging their sustainable management.

Ash is Devon's second most frequent hedgerow tree.

2. Contents

1. Summary
2. Contents
3. About ash dieback
4. General management advice
5. Ash trees in Devon
6. The likely impact of ash dieback in Devon
   - 6.1 Landscape
   - 6.2 Biodiversity
   - 6.3 Landowners and managers
   - 6.4 Public bodies
   - 6.5 Electricity, telephone and rail
   - 6.6 Wood businesses
7. Taking action (an action table follows section 9)
8. Further information
9. Acknowledgements
10. Priority actions, estimated costs and lead delivery partners

3. About ash dieback

3.1. Ash dieback is a fungal disease of ash trees *Fraxineus excelsior*. First recognised in Poland in 1992, it was initially given the name *Chalara fraxineus,* then *Hymenoscyphus pseudoalbidus*, and finally *Hymenoscyphus fraxineus*. The disease is fatal for most young ash trees, others succumbing from pests and other pathogens once weakened by ash dieback. Within 5 to 15 years we may expect the disease to be present across most of Devon, and for a high proportion, probably most, of our ashes to be infected, with many dying back if not dead. Responding to this, and restoring the damaged landscape, will be a major challenge.

3.2. The fungus has spread rapidly across Europe. First recorded in Britain in 2012, evidence suggests it arrived here perhaps a decade earlier. It is now widespread in the wider environment (that is outside tree nurseries) in East Anglia, south-east England, Lancashire and eastern Scotland. Currently (February 2016) there is only one confirmed outbreak in Devon, along the Exe valley to the south of Tiverton: from here it appears to be spreading rapidly.

3.3. There is no cure for the disease, and any treatment to prevent infection is likely to be prohibitively expensive. Furthermore, no immunity exists. However, trees do exhibit varying degrees of resilience. In Denmark, 10% of trees have been found to be moderately resistant to the disease, with 1-2% having high resistance[1]. Even the long term fate of highly resilient trees is not known since they can continue to be re-infected each year and this may over time lead to reduced vigour and increased susceptibility to other pathogens such as honey fungus *Armilleria*. A small proportion of trees, young and old, are highly susceptible to the disease and are severely affected soon after the disease arrives in any area. This initial wave of damage can give the impression the impact of the disease will be far worse than that actually experienced[2].

[1] Jo Clark, Living Ash Project
[2] Iben Margrete Thomsen, University of Copenhagen

3.4. Research has revealed that Britain's ash trees have a greater genetic diversity than those in Denmark, and a higher proportion of an allele which confers resilience, offering hope that fewer of our trees may succumb. The Living Ash Project[3], established by a partnership of organisations including Defra and Forest Research, is currently carrying out screening and selection trials to identify individuals with a high degree of tolerance which may be cloned or bred for future restocking. However, it remains sensible to plan on the basis that a high proportion of our ash trees will *eventually* be killed or severely damaged.

3.5. The disease is spread by the wind through spores produced from fruiting bodies on fallen leaves, particularly on their central stem (technically the rachis), and in some cases on small, moist pieces of infected shoots. Infection mostly occurs through spores landing on leaves or twigs but, importantly, can also occur at the base of trunks. Where such root collar infection occurs, the affected trees can, if infected by honey fungus, rapidly become unstable and dangerous, without any obvious dieback symptoms in the canopy. Basal infection seems to occur mainly in forests and woodlands, including coppice[2].

3.6. The disease affects all ash trees: young or old; maiden, coppice or pollard. Young trees and coppice re-growth succumb quickly because they are unable to seal off infected areas rapidly enough to prevent their main stems being infected all the way through. However, many healthy, otherwise unstressed, mature trees can apparently survive for many years[2].

3.7. In the long term there is no way of stopping the spread of the disease. In the short term spreading can be delayed by the removal of fallen leaves (rarely practical except with isolated trees in an urban environment) and by taking biosecurity measures, with woodland workers and visitors moving outside infected areas taking care to wash their boots and vehicles to remove any leaves and small pieces of infected shoots[4]. Biosecurity is in any case desirable to prevent the spread of other tree diseases: ash is further threatened by the possible future arrival of the emerald ash borer *Agrilus planipennis* which has caused widespread devastation to ashes in North America.

3.8. Typically infection rates follow a J-shaped curve, with high levels of infection only apparent about 8 to 10 years after the fungus first arrives in an area[5]. Experience from Suffolk, Kent and the outbreak near Tiverton in Devon then suggests over 90% of woodland trees will exhibit symptoms, often severe ones. The degree to which the disease impacts on individual trees can, however, vary considerably between years – a progression towards death is not inevitable[2], although trees that are weakened will become more susceptible to other pathogens.

3.9. In non-woodland situations, there is currently considerable uncertainty about levels of infection, dieback and mortality. Factors that will influence the severity of the disease in these situations include levels of tree stress, the density and age of trees, continuity of landscape features such as hedges, and the prevalence of other pathogens such as honey fungus. A worse case situation is that, as for woodland trees, over 90% will exhibit severe symptoms within 5 to 15 years. The current majority view is that it is more likely that about

[3] http://livingashproject.org.uk/

[4] For further information on biosecurity with regard to tree pests and diseases, see http://www.forestry.gov.uk/biosecurity

[5] Jon Stokes, Tree Council

50% of trees will be affected within this timescale to the extent that they are at risk of shedding large limbs[6], although views differ considerably on this point.

3.10. In 2013, Defra produced a Chalara Management Plan which set out a number of high level actions necessary to respond to the disease[7]. This plan focuses heavily on tackling ash dieback in woodland settings. Based on modelling carried out by the University of Cambridge, the plan identifies Devon as a county to which ash dieback poses a high hazard, based largely on the high number of woodland ash in the county and high levels of landscape continuity.

3.11. In February 2015 The Tree Council wrote a report for Defra on responding to the disease in non-woodland situations. This was published on line in December 2015[8]. The report proposes an action plan for central government based on the assumption that ash dieback in non-woodland trees will pose serious national issues. These issues, the reports notes, will often be dealt with by local authorities and agencies. Central government should, it is suggested, work closely with organisations in the non-woodland sector. Further, the development of local action plans (such as this document) should be promoted as a useful tool to prepare for and deal with the arrival of ash dieback disease. Organisations, at both national and local levels, should be identified to develop best practice and share it through local action plans.

3.12. For further information on the biology of the fungus and on its symptoms see the following:

- The Forestry Commission. http://www.forestry.gov.uk/ashdieback
- The Living Ash Project http://livingashproject.org.uk/
- *Chalara: On the front-line.* Gary Batell, for Suffolk County Council. Presentation available at http://rfs.org.uk/learning/external-advice-and-guidance/tree-diseases/
- For an up-to-date GB map on confirmed reports for the disease, see http://chalaramap.fera.defra.gov.uk/

[6] Forestry Commission, personal communication, October 2015

[7] Defra. March 2013. Chalara Management Plan. https://www.gov.uk/government/publications/chalara-management-plan

[8] The Tree Council. February 2015. Chalara in non-woodland situations: Findings from a 2104 study. Defra report TH0148. http://sciencesearch.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&Completed=0&ProjectID=19770

The disease can infect trees through the base of their trunks, or root collars. Such trees, if infected by honey fungus, can rapidly become unsafe without obvious signs of infection in the canopy.

4. General management advice

4.1. Advice on how to manage infected woodlands and urban and peri-urban areas (but not rural non-woodland features such as hedges) can be found in a guidance document produce by the Forestry Commission in March 2015: *Managing Chalara dieback of ash in South West England*[9]. The Royal Forestry Society provides further guidance on the management of infected woods[10].

4.2. The two key issues are firstly when to fell trees, and secondly what to replace them with. **The consensus is that pre-emptive felling should be exceptional and that infected trees should be felled only once they are clearly dying or pose an imminent danger, or where significant timber value is likely to be lost through infection.** This advice is given mainly on the basis that (a) we must take every opportunity to identify and retain those rare trees that are highly resilient to dieback, and (b) the decaying wood within dead and dying trees is a valuable wildlife habitat. However, for economic reasons, within commercial woodlands and especially alongside roads it may at times be sensible to fell early. There are issues that need to be resolved with regard to the necessity for Felling Licences and the speed with which they are issued, and, for farmers in the Basic Payment Scheme (i.e. nearly all farmers), compliance with GAEC 7c[11]. Very occasionally it may be appropriate to pollard trees rather than fell them, to encourage deadwood habitat.

4.3. The choice of trees to plant or encourage as replacements for lost ash is not straightforward. No one native tree or even several species together will fully substitute for the ecological traits, biodiversity or commercial attributes of ash. Instead, replacement planting should focus on a diversity of species, the exact mix being dependent on site-

[9] http://www.forestry.gov.uk/pdf/A4_SouthWestofEngland_chalara_FINAL.pdf.
[10] http://rfs.org.uk/learning/external-advice-and-guidance/tree-diseases/
[11] Good Agricultural and Environmental Conditions. See *The Guide to cross compliance in England 2015*. Defra.

specific characteristics informed by climate change resilience and ecosystem service delivery. Species choice should consider elm (lines resistant to Dutch elm disease are now available) and European species not currently found in the British Isles. Full information on alternative trees is given in a Natural England report[12]. See also the Forestry Commission ecological site classification for species selection[13].

Jo Hart from the Living Ash Project fixing a tag to a tree near Tiverton as part of a citizen science project to find trees which are highly resistant to the disease.

5. Ash trees in Devon

5.1. Ash is a common tree across most of Devon. It is often abundant within landscape features such as hedges and strips of trees alongside rivers, roads and railways. It is also a frequent tree within our woodlands.

5.2. In a British context, the density of ash trees within Devon's woodlands is graded medium to high, while within woody linear features (for example hedges and tree belts) the density is among the highest in the country[14]. As an individual, isolated, tree it occurs at only moderate density in comparison to parts of the East Midlands. Across Britain, Devon has the sixth highest proportion of its land covered in ash woodland, at 1.53% (11,000 ha)[15].

5.3. The Forestry Commission census of woodlands and trees (1979-1982) estimated that there were 7.3 million non-woodland trees across Devon[16]. Of these, more than half a million were found as isolated trees in boundaries such as hedges, banks, fences and walls. By far the most widely represented species were oak and ash, forming 29% and 26% respectively of all such trees. At that time we therefore had about 1.9 million ash trees outside woodlands in Devon, a figure which only included mature or semi-mature specimens. Today we probably have more such trees because many hedges have been permitted to develop into tree lines. The 2012 estimate of nearly half a million roadside ash trees bigger

[12] Natural England Commissioned Report NECR151*: Assessing and addressing the impacts of ash dieback on UK woodlands and trees of conservation importance (Phase 2). April 2014.*
[13] https://www.eforestry.gov.uk/forestdss/
[14] Maskell *et al.* 2013, Distribution of ash trees (*Fraxinus excelsior*) in Countryside Survey data, Centre for Ecology and Hydrology.
[15] The Tree Council.
[16] From Devon Hedge Group and Devon County Council. *Devon Hedges*. 2014. In 2007, 773 hedges were surveyed across 6 parishes.

than about 7.5 cm in diameter (see 5.5. below) confirms that the 1.9 million figure represents only larger trees, and that the true number of non-woodland ash in the county is much greater.

5.4. As a hedgerow tree, ash is our second most frequent tree after oak and as a component of the shrub layer of hedges, the fourth most frequent species after blackthorn, hazel and hawthorn[17].

5.5. In 2012, Devon County Council counted ash trees with stems larger than baked bean can size (7.5 cm diameter) along sample lengths of approximately 30km of A roads and 10km each of B, C and unclassified roads, across all planning authority areas in Devon except Torbay and Plymouth. From this, it was estimated that there are 448,000 trees alongside the county's 13,000 km of road (see table 1), excepting Torbay and Plymouth. Of these, the great majority (98.6%) are considered the responsibility of the landowner, the Highways Authority being responsible for just some 6,300 trees. The average number of trees per km was 12 for A roads, 21 for B roads, 36 for C roads and 33 for unclassified roads.

Local authority area	Estimated number of ash	Ash / km
South Hams	30,811	16
West Devon	74,487	50
Torridge	49,532	29
North Devon	45,284	22
Mid Devon	58,527	33
East Devon	103,644	53
Teignbridge	85,028	51
Exeter	325	8
Total	**447,639**	**263**

Table 1. Estimated total number of ash trees within falling distance of the highway in each local authority area in Devon except for Torbay and Plymouth. Devon County Council, 2012.

5.6. Pure ash woods are rare in Devon. It is, however, a common species within most of our woodlands, often along with oak, and frequently dominates small stands of 0.5 ha or less both in semi-natural woods and plantations. As noted above, Devon has some 11,000 ha of ash its woodlands: the total area of broadleaved and mixed broadleaved woods over 0.5 ha in the county is 48,548 ha[18]. Thus 22% of our woodland is covered by ash[19].

5.7. In urban and other built-up settings, ash trees are frequent within parks and gardens in Devon. During 2011 an i-Tree investigation was undertaken in Torbay[20]. The number of ash trees over 2.4 cm diameter at breast height was estimated to be nearly 95,000, second only to Leyland cypress. Furthermore, ash was reckoned to contribute the largest (19.5%) leaf area of all species present. Ash is more prevalent in Torbay, comprising 11.6% of the

[17] Roland Stonex and Craig Hodgson. *Devon Hedgerow Survey Project*. FWAG. 2008.
[18] National Forest Inventory data collected between 2002 and 2009.
[19] In 2011, across the South-West region as a whole, 17% of the area of broadleaved woodland was occupied by ash, and 13% of the trees in broadleaved woodland were ash (National Forest Inventory).
[20] Treeconomics, 2011. Torbay's urban forest. A report on the findings from the UK i-Tree Eco pilot project. Exeter. www.torbay.gov.uk/tuf.pdf

total number of trees, than in other UK urban areas where the average is 4.1%. The cost of replacing Torbay's ash trees was estimated to be £38M.

5.8. An i-Tree Devon survey carried out in the Sid Valley by volunteers in 2014 found that ash cover was second only to that of Douglas fir, occupying 18% of leaf area[21]. The report concluded that the loss of ash would have by the far the greatest impact of any tree on society in terms of the benefits that trees have to offer.

5.9. County Council estimates there are 3,100 trees within the grounds of the 329 schools that it is responsible for, and across the council's estate as a whole (which does not include any parks), 3,900 trees.

5.10. In biodiversity and landscape terms, the most valuable trees are those which are either ancient, veterans (e.g. hollow) or very large. The Ancient Tree Inventory [22] currently lists 12 ancient ashes within Devon and 123 other veterans. These include five trees with a girth greater than 6m, nine with a girth greater than 5m, 36 greater than 4.71m (the threshold for potential national significance according to the Joint Nature Conservation Committee, and 96 greater than 3m. The largest girth is 6.32m, which is massive[23]. Many more large trees exist but are as yet unrecorded. Ancient and veteran ash trees are mainly found within the county's parks, hedges and other landscape features, rather than within closed woodlands.

The loss of ash trees will have a big impact on landscape character in some parts of the county, as near Chagford (Dartmoor) where this photo was taken.

6. The likely impact of ash dieback in Devon

6.1. Landscape

6.1.1. If, as is likely to be so, the majority of our ash trees are affected to some degree, then the impact of the disease on our landscapes could potentially be more severe than that of Dutch elm disease in the 1970s. Although baseline information on the former prevalence of mature elm trees is lacking, ash is more abundant that elm ever was

[21] Sidmouth Arboretum tree survey. Summary report on i-tree eco survey carried out in the Sid Valley 2014. http://www.sidmoutharboretum.org.uk/documents/tree_survey_report_v6.pdf

[22] http://www.ancient-tree-hunt.org.uk/

[23] Figures provided by Jill Butler, Woodland Trust, 5 November 2015.

over most of Devon. While the rootstocks of most elms survive and continue to send up suckering growth, this is not true of ash: on the other hand, many otherwise healthy mature ash trees are likely to survive for many years, some perhaps indefinitely.

6.1.2. The impact on the hedged landscapes for which Devon is famed may be particularly strong. The decline of mature ash trees, especially those which are isolated rather than within lines of trees, will exacerbate the loss of hedgerow trees already happening across the county, the number of mature specimens dying or being felled being greater than the number of young trees encouraged to grow as replacements[24].

6.1.3. Hedgerow trees are listed as being important landscape features in the profiles of all six of Devon's National Character Areas, with ash often specified along with oak and beech. The importance of conserving ancient and veteran trees is usually highlighted[25].

The disease is likely to cause much damage to Devon's landscape – restorative action needs to start now.

6.2. Biodiversity

6.2.1. Across the UK, nearly a thousand species are known to be associated with ash trees: 12 birds, 28 mammals, 58 bryophytes, 68 fungi, 239 invertebrates and 548 lichens[26]. Of these 62 are highly associated with the tree, and 44 are restricted to it. Those species which are in the last category or highly associated with ash and already accorded threatened status are those at particular risk from dieback. There are 69 such species

[24] Forest Research, 2009. *Trends, long term survival and ecological values of hedgerow trees: development of populations models to inform strategy*. Report to Defra BD2111.

[25] For NCAs, see https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles#ncas-in-south-west-england

[26] Mitchell *et al.* 2014. Ash dieback in the UK: A review of the ecological and conservation implications and potential management options. *Biological Conservation* 175, 95–109.

in the UK: 13 fungi, 6 bryophytes, 37 invertebrates and 13 lichens. Of these, 14 occur in Devon, four fungi, four lichens, one moss, three moths and one beetle[27]. Assuming high levels of tree mortality, it is probable that one or two lichens will be at risk of extinction at a county level, while other obligate and highly associated species found in the county will experience large population declines.

6.2.2. The loss of ash, especially from woodland, is likely to have other, less direct, consequences for biodiversity. The tree is especially notable for the rapid rate of decomposition of its leaves with a consequent high rate of nutrient recycling in stands where it is frequent. A shift of woodland composition towards other tree species as a result of ash dieback is therefore predicted to result in slower nutrient cycling, greater carbon storage, changes in soil formation, and shifts in soil community with resulting changes in ecosystem function[20].

6.2.3. In practical terms, understanding which site-specific species and communities (e.g. of woodland ground flora) are likely to be adversely affected by ash loss will be important for woodland managers, so while retaining infected trees for as long as possible, they can choose appropriate replacement trees to plant or encourage.

6.2.4. Special attention should be paid to Sites of Special Scientific Interest and other places of particular nature conservation importance where ash is a significant feature. Natural England and the Forestry Commission have produced a guidance note for woodland SSSIs[28].

6.3. Landowners and managers

6.3.1. The extra work and expense that landowners and managers will incur as a result of ash dieback is likely to be considerable. Unlike oaks, dead ashes and those that are dying back rapidly become unstable, readily shedding limbs and falling, so posing a substantial and often unpredictable threat to human and livestock safety, to buildings, and to overhead cables. This issue is particularly pertinent to trees alongside roads and other public rights of way.

6.3.2. The typical cost of felling and removing a mature roadside tree is about £800 – a conservative figure where traffic has to be controlled[29]. Smaller trees will cost less, and where lines of tree can be removed at the same time unit price will fall, so an average cost per tree may be £400. The use of specialised tree removal equipment such as excavator-mounted tree shears may reduce the costs further. Few landowners are likely to be willing to cover the expense of tree surgery work such as limb removal or crown reduction.

6.3.3. With private individuals being responsible for an estimated 442,000 ash trees along Devon's highways (see above), in a worse case situation which assumes 90% mortality and based on a figure of £400 per tree, the potential total cost to farmers and others could be in the order of £160 million! Even if just 50% of trees are so badly affected that that are at risk of shedding limbs onto highways, considerable short-term strain will be placed on financial reserves or labour.

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[27] Devon Biodiversity Records Centre

[28] C. Reid, E. Goldberg & J. Alsop. April 2015. What can we do about "Chalara" ash dieback (*Hymenoscyphus fraxineus*) on woodland SSSIs? Joint advice from Natural England and the Forestry Commission. http://rfs.org.uk/media/160458/ash-dieback-sssi-management-advice-april-2015.pdf

[29] The Tree Council, Kent County Council.

6.3.4. Say a farmer has 100 large ash trees bordering roads or paths, and that 50% of these become unsafe within a period of 10 years, then they may have to find £2,000 each year to manage the risks. The situation will be made more difficult to manage if there is a shortage in trained and insured tree surgeons available to do the work: rogue operatives may cause further problems.

6.3.5. In addition there will be impacts on the function and economic value of any managed woodlands, especially of plantations with a high proportion of ash.

6.3.6. On the other hand, there may be an opportunity to achieve an income through the sale of ash wood, usually as fuel (see 6.6.3 below). There may be a glut, reducing the price of firewood in the short term, but the overall trend is for firewood prices to increase.

Diseased ash trees readily shed branches. Suffolk, 2014.

6.4. Public bodies

6.4.1. As with landowners and managers, local and highways authorities will face significant increased expense, along with regulatory bodies such as the Forestry Commission and NGOs.

6.4.2. Ash trees in parks, schools, sports grounds and other public places, as well as those alongside roads, will need to be inspected more frequently than at present, and made safe as necessary. As outlined under 6.3.2 above, this will be expensive.

6.4.3. There will also be costs linked to issuing felling licences, handling cases where Tree Preservation Orders or Conservation Areas apply, and responding to public concern.

6.4.4. Landscape restoration, in particular replanting, will add to costs.

6.5. Electricity, telephone and rail

6.5.1. Electricity and telephone cables often run above and alongside hedges and other woody linear features. Lines frequently run through or besides rows of ash trees, especially where hedges have been allowed to grow freely. Ash dieback therefore

poses a considerable risk to Devon's power and communication networks: managing affected ash trees will be a major operation for the utilities and landowners concerned, adding both to costs and creating logistical challenges.

6.5.2. Ash is a frequent tree alongside Devon's railways, so the disease will necessitate widespread felling if travel is not to be disrupted. Network Rail will need to allocate further resources to tree clearance work.

Overhead cables commonly run through or next to ashes.

6.6. Wood businesses

6.6.1. Ash is a moderately valuable timber and an excellent source of firewood. Its loss will be felt keenly, although in the short term the disease will boost firewood supply (see also 6.3.6).

6.6.2. Only a small proportion of broadleaved woodlands in the county are currently cropped[30] but where they are, especially in plantations, the disease will render most ash trees valueless as a source of timber or other high-value products: they will be useful only for firewood unless the wood is processed before decay. This will have economic repercussions for woodland owners: assuming trees of all species are of similar value and if Devon has the same proportion of ash trees as the region as whole, then broadleaved woods managed for timber could lose up on average 13% of their value. Managers may, however, choose to crop stands or individual trees at a suboptimal stage in advance of infection, so that at least some of their value can be realised. Some 97% of broadleaved woodlands in Devon (and Somerset) are in private ownerships as opposed to being managed by the Forestry Commission[23], so the impact will be felt very largely in the private sector.

[30] *HoTSW Forestry Enterprise Action Plan: A business case for the growth and development of the Forestry and Woodland Sector*. The Silvanus Trust and Laura Jones Associates. Draft, August 2015.

6.6.3. As a by-product of laying or coppicing hedges, ash is highly valued as a source of firewood, usually as logs although occasionally as woodchip[31]. In West Dorset, close to the Devon border, there exists a small but profitable farm firewood business based on harvesting wood including ash from hedges, supplemented with material from woodlands[32]. There is much opportunity for similar enterprises to be established in Devon. The large quantities of ash wood that will become available as dieback hits Devon could be used to kick start these: one potential silver lining to the situation.

7. Taking action

7.1. This action plan sets out to identify and manage the risks from the disease to the environment (landscape and biodiversity), to public safety (falling trees) and to communication networks (roads and overhead cables). It also considers the likely costs of responding to the disease, and so identifies where extra resources are likely to be needed.

7.2. The approach taken to identify necessary actions is to the split them between those that are a priority because they pose a short term major risk, as to public safety, and those that pose a longer-term risk, as to the environment. Other actions are identified to address regulation, training, business and forward planning needs.

7.3. For non-woodland trees, the approach considers both a worst case scenario, where over 90% of ashes die or are clearly dying within a 5-15 year period, and a less severe scenario, where about 50% of non-woodland ashes are affected within the same period to the extent that they are likely to at least shed large limbs. The current majority view is that the second scenario is more likely. In woodland situations, particularly in single-species stands, current evidence suggests that over 90% of ashes are likely to die or be severely affected.

7.4. Whether risks are short or long term, and whether we experience the worst case scenario or one that is less severe, a proactive, coordinated and enduring response is required. Proactive planning is needed if the county is to manage the disease well and prevent it becoming a crisis.

7.5. The table below identifies the key actions required to address each of seven major issue or risk areas. Risks to public safety and communication networks are considered to be short-term risks (i.e. likely to be faced within a decade), those to the environment longer-term risks.

7.6. For each action, an assessment is made of its priority relative to others and its likely costs (split very broadly in high, medium and low), and lead organisations are suggested.

7.7. Actions which need to occur primarily at a national level, such as identifying and cloning high-resistance trees and preventing the introduction of emerald ash borer and other pests and diseases, are not included in this table: they are of high importance, but not of particular relevance to a county level action plan.

[31] Devon County Council, Tamar Valley AONB and The Devon Hedge Group. *Wood fuel from hedges*. 2014.
[32] Ross Dickinson, Thane Farm. *A small scale firewood business*, 2014.

7.8. It is envisioned that further, more detailed, county plans will be necessary to address specific issues. Also, naturally, this plan will need to be revised and updated on a regular basis.

8. Further information

8.1. In addition to the documents and other resources referred to in the text and footnotes above, the following are relevant:

- East Anglian Tree and Landscape Officers' Group (EATaLOG). *Chalara Action Kit*. October 2014.
- FRAXBACK http://www.fraxback.eu
- Joe Alsop. *Woodland and tree management in the wake of Ash Dieback (Hymenoscyphus fraxineus): Experience from Continental Europe - Denmark, France, Germany, Lithuania, Luxembourg, Sweden and Switzerland.* Report for the Winston Churchill Memorial Trust. 2015.
- Living Ash Project. Presentations by Jo Clark and Edward Wilson on the biology of ash dieback, silviculture, research to find tolerant trees and citizen science surveys. http://livingashproject.org.uk/
- Natural England and the Forestry Commission. *What can we do about "Chalara" ash dieback (Hymenoscyphus fraxineus) on woodland SSSIs?* Advice note prepared by Christine Reid & Emma Goldberg with Joe Alsop and other staff from Natural England and the Forestry Commission. April 2015.
- Oliver Rackham. *The ash tree*. Little Toller Books. 2014.
- Tree Council. *Chalara Local Action Plan*. Unpublished outline of contents for such plans. 2015.
- 2B Landscape Consultancy Ltd and HEYwoods. *Tree and shrub species for Hull and East Yorkshire*. Note with map to assist land managers choose alternative species to ash. 2013.[33]

9. Acknowledgements

9.1. This plan has been written by Robert Wolton robertwolton@yahoo.co.uk on behalf of the Devon Local Nature Partnership and the Devon Hedge Group, with funding provided by Devon County Council.

9.2. The plan's contents draw heavily on the outcomes of an ash dieback workshop held at Bicton College in March 2015, attended by about 70 people from across a wide range of organisations.

9.3. Many people have commented on drafts of this plan. Particular thanks to Dr Iben Margrete Thomsen of the University of Copenhagen, Dr Anne Edwards of the John Innes Centre, Mick Biddle from the Forestry Commission, Jon Stokes from the Tree Council, Gary Battell from Suffolk County Council, and Helene Jessop and Kevin Rylands from the RSPB.

[33] http://www.2bconsultancy.co.uk/ashdieback.htm?utm_source=Landscape+Institute&utm_medium=email&utm_campaign=5811244_Biosecurity+newsletter+-+June+2015&dm_i=6KZ,3GJZG,B5JIZK,CEKDJ,1

10. Priority actions, estimated costs and lead delivery partners

Section 1: Plan delivery, communication and strategic planning
Section 2: Short term risks, to public safety and communication networks
Section 3: Longer term risks, to the environment
Section 4: Survey and monitoring, and biosecurity
Section 5: Training
Section 6: Regulation
Section 7: Wood-based businesses

- *Worst case scenario: over 90% of ashes die or are clearly dying within a 5-15 year period, both within woodlands and outside woodlands.*
- *More likely scenario: 90% of woodland ashes die or are clearly dying within a 5-15 year period, but only about 50% of non-woodland ashes are affected within the same period to the extent that they are likely to at least shed large limbs.*

Section 1: Plan delivery, communication and strategic planning

Action point number	Topic	Key people/bodies affected	Actions	Priority	Cost Low <£10K Medium £10K -£100K High >£100K	Suggested lead partners
1	Action plan delivery	Devon Local Nature Partnership	Establish a steering group to coordinate and promote this action plan, and to monitor it, revising the plan as necessary.	High	Low	Local Resilience Forum[34]
2	Communication	All sectors, including plan delivery bodies, general public , farmers and other land managers, garden centres, agricultural	Develop and deliver a communications plan, to promote engagement by those bodies asked to help lead delivery of this plan, and to provide information and guidance to farmers, foresters, woodland owners, other landowners and managers, tree professionals (especially those not in professional associations), government and agency staff, colleges, the general	High	Development – Low Delivery - Medium	Local Resilience Forum

[34] https://www.dcisprepared.org.uk/lrfhomepage

		suppliers, etc	public and the media.			
3			Consider establishing a county website for the disease.	Low	Low	Local Resilience Forum
4	Knowledge exchange	Devon Local Nature Partnership	Exchange knowledge with authorities in Kent and Suffolk, including holding a workshop in 2016.	High	Low	Devon County Council
5	Strategic planning	Policy makers and shapers	Revise and update strategic plans.	Medium	Low	Local authorities National Park Authorities & AONBs Natural England
6			Make more detailed assessments of likely costs, and press for increased funding as appropriate.	High	Low	Local Resilience Forum

Section 2: Short term risks, to public safety and communication networks

Action point no.	Topic	Key people/bodies affected	Actions	Priority	Cost Low <£10K Medium £10K -£100K High >£100K	Suggested lead partners
7	Ash trees along public roads, PROW and railways	Landowners and managers, including farmers and woodland managers	Provide advice specifically for farmers on how to manage the disease, including regulatory requirements.	High	Low	Local Resilience Forum Forestry Commission FWAGSW Campaign for the Farmed Environment
8			In advance of the disease and at site (e.g. farm) level, survey to identify at risk ash trees and to assess scale of potential problem considering both worse case and more favourable scenarios.	High	Low	Farm and landowner organisations: eg NFU CLA FWAGSW
9			Develop site-specific ash management plans so work is phased, practical and can be adequately resourced.	High	Low	As above
10			Carry out annual or more frequent inspections of at risk trees.	High	Medium	As above

11			Fell trees as prudent for public safety, following best practice guidance.	High	**Worst case £160 M across county. More likely £50 - 90M.**	As above
12			Plant or encourage replacement trees, following best practice guidance, to promote landscape resilience.	High	Medium	As above, plus tree nurseries
13		Highways authorities	Review and refine data on ash tree distribution and number alongside roads, building on sample work already carried out by DCC, and using new survey techniques as they become available.	Medium	Medium	Devon County Council Highways England Torbay Council Plymouth Council
14			Assist private landowners to recognise their obligations and to meet them.	High	Medium	As above
15			Other actions as for landowners, etc.	High	**Worst case £2.5 M across county. More likely £0.8 – 1.4M.**	As above
16	Ash trees near overhead cables	Telephone and electricity distribution network operators	Survey, plan, inspect, fell and replace ash trees.	High	**£ millions**	Western Power Distribution BT
17	Ash trees away from roads, cables, etc	Landowners and managers, including farmers and woodland managers	Provide advice for farmers on how to manage the disease, including regulatory requirements. Focus on helping farmers to make well informed decisions. See also Actions 2 & 7 above.	High	Low	Forestry Commission SWFWAG Campaign for the Farmed Environment
18			Carry out remedial work to, or fell, trees where they pose a significant risk to people, livestock, buildings, fences and other infrastructure.	High	High	As above

Section 3: Longer term risks, to the environment

Action point no.	Topic	Key people/bodies affected	Actions	Priority	Cost Low <£10K Medium £10K -£100K High >£100K	Suggested lead partners
19	Biodiversity impact	Managers of nature conservation sites, especially SSSIs and County Wildlife Sites	Identify sites or individual trees with species specific to ash, or highly associated with it and under threat in England, and ash trees with exceptionally important veteran features.	High	Low	Devon Biodiversity Records Centre, Natural England
20			Take action to conserve these key trees, including remedial work, and any important linked species.	High	Medium	Natural England Devon Wildlife Trust National Trust
21			Tailor Countryside Stewardship to reflect impact of the disease.	Medium	Medium	Natural England
22			Promote the healthy, sustainable, management of hedges, woods, etc to increase their resilience to ash dieback and other diseases.	High	Medium	Forestry Commission Natural England Devon Hedge Group FWAGSW
23	Landscape restoration	Landowners and managers, both private and public	Identify parts of the county where loss of ash from hedges, etc, will have particular landscape impact.	Medium	Low	Natural England Devon Hedge Group
24			Provide National Character Area specific advice on suitable replacement trees.	High	Low	Forestry Commission Devon Hedge Group
25			Develop and deliver a scheme to encourage land managers to plant/encourage replacement trees, in advance of the disease.	High	50K?	Devon County Council Devon Hedge Group FWAGSW

Section 4: Survey and monitoring, and biosecurity

Action point no.	Topic	Key people/bodies affected	Actions	Priority	Cost Low <£10K Medium £10K -£100K High >£100K	Suggested lead partners
26	Survey and monitoring	Volunteers, foresters and tree professionals	Track and map the spread of disease across Devon, monitor fate of selected individuals and populations, and in particular identify high-resistance trees. Encourage Citizen science.	Medium	Low	Forestry Commission Living Ash Project AshTag www.ashtag.org/
27			Establish a baseline of frequency and distribution of ash trees in Devon, to guide landscape restoration, informed by National Character Areas.	Medium	Medium	Local Resilience Forum
28	Biosecurity	Professionals and advisers visiting infected woods and then moving into areas the disease has not yet reached	Advise people to wash boots, vehicles, etc.	Medium	Low	Local Resilience Forum

Section 5: Training and communication

Action point no.	Topic	Key people/bodies affected	Actions	Priority	Cost Low <£10K Medium £10K -£100K High >£100K	Suggested lead partners
29	Training	Tree professionals (surgeons, etc), tree wardens, volunteers	Provide guidance and training opportunities (e.g. workshops) for those involved in surveys, inspections, giving advice , tree felling, etc.	High	Medium	Forestry Commission
30			Assess now whether there are sufficient such professionals in the county to meet the likely high level of demand, and if not facilitate necessary skill development.	Medium	Medium?	Local Resilience Forum Vocational colleges

Section 6: Regulation

Action point no.	Topic	Key people/bodies affected	Actions	Priority	Cost Low <£10K Medium £10K -£100K High >£100K	Suggested lead partners
31	Regulation	Farmers and woodland managers	Clarify the need for Felling Licences and introduce fast track application procedures, backed by adequate staff resources.	Medium	Low	Forestry Commission
32		Home owners	Ensure adequate staffing for TPO, Conservation Area, etc, consultations and notices.	Medium	Low	Local and Unitary Authorities
33		All tree managers and professionals	Ensure tree professionals are aware of the protection afforded to bats and of necessary procedures. Issue licences rapidly where appropriate.	Medium	Low	Natural England
34		Farmers	Clarify requirements under GAEC 7c.	Medium	Low	Defra

Section 7: Wood-based businesses

Action point no.	Topic	Key people/bodies affected	Actions	Priority	Cost Low <£10K Medium £10K -£100K High >£100K	Suggested lead partners
35	Wood-based businesses	Foresters, timber producers, wood processors, firewood suppliers	Manage woodlands in accordance with Forestry Commission and Royal Forestry Society Guidance, to slow the rate of spread, protect timber values, minimise the impact on biodiversity and increase the longer term resilience of trees and woods.	High	Medium	Forestry Commission
36			Encourage the establishment of new local businesses based on harvesting wood, as logs or	Medium	Medium	Forestry Task and Finish Group

			woodchip, from landscape features such as hedges, to encourage sustainable management, job creation and to help meet climate change targets. The supply of dead and dying ash can kick start this.			Heart of The SW Local Enterprise Plan partnership Local Action Groups

DLNP
Natural Devon
Devon Local Nature Partnership

Devon
County Council

Forestry Commission
England

DEVON HEDGE GROUP