Survey Report for the Malvern Hills AONB Partnership

Scoping the potential impact of Chalara die-back of ash trees on the Malvern Hills Area of Outstanding Natural Beauty

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Key to maps

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1. Introduction

1.1 Common ash (*Fraxinus Excelsior*) is a widespread and important tree in the Malvern Hills AONB, forming a key element of wooded and unwooded landscapes.

1.2 Chalara dieback of ash, also known as Chalara or ash dieback, is a disease of ash trees caused by the fungus *Hymenoscyphus fraxineus*. Chalara causes leaf loss, crown dieback and bark lesions in affected trees. Once a tree is infected the disease is usually fatal, either directly, or indirectly by weakening the tree to the point where it succumbs more readily to attacks by other pests or pathogens, especially Armillaria fungi, or honey fungus.

1.3 The first signs of Chalara in Britain were found in a nursery in Buckinghamshire in February 2012. We don't yet know what the full impact of Chalara will be in Britain. We do know that Chalara dieback of ash has potential to cause significant damage to the UK's ash population. It has caused widespread damage to ash populations in continental Europe, where experience indicates that it can kill young ash trees quite quickly, while older trees can resist it for some time until prolonged exposure, or another pest or pathogen attacking them in their weakened state, eventually causes them to succumb.

1.4 More information on the disease and its effects can be found at:
http://www.forestry.gov.uk/ashdieback

2. Aim and objectives

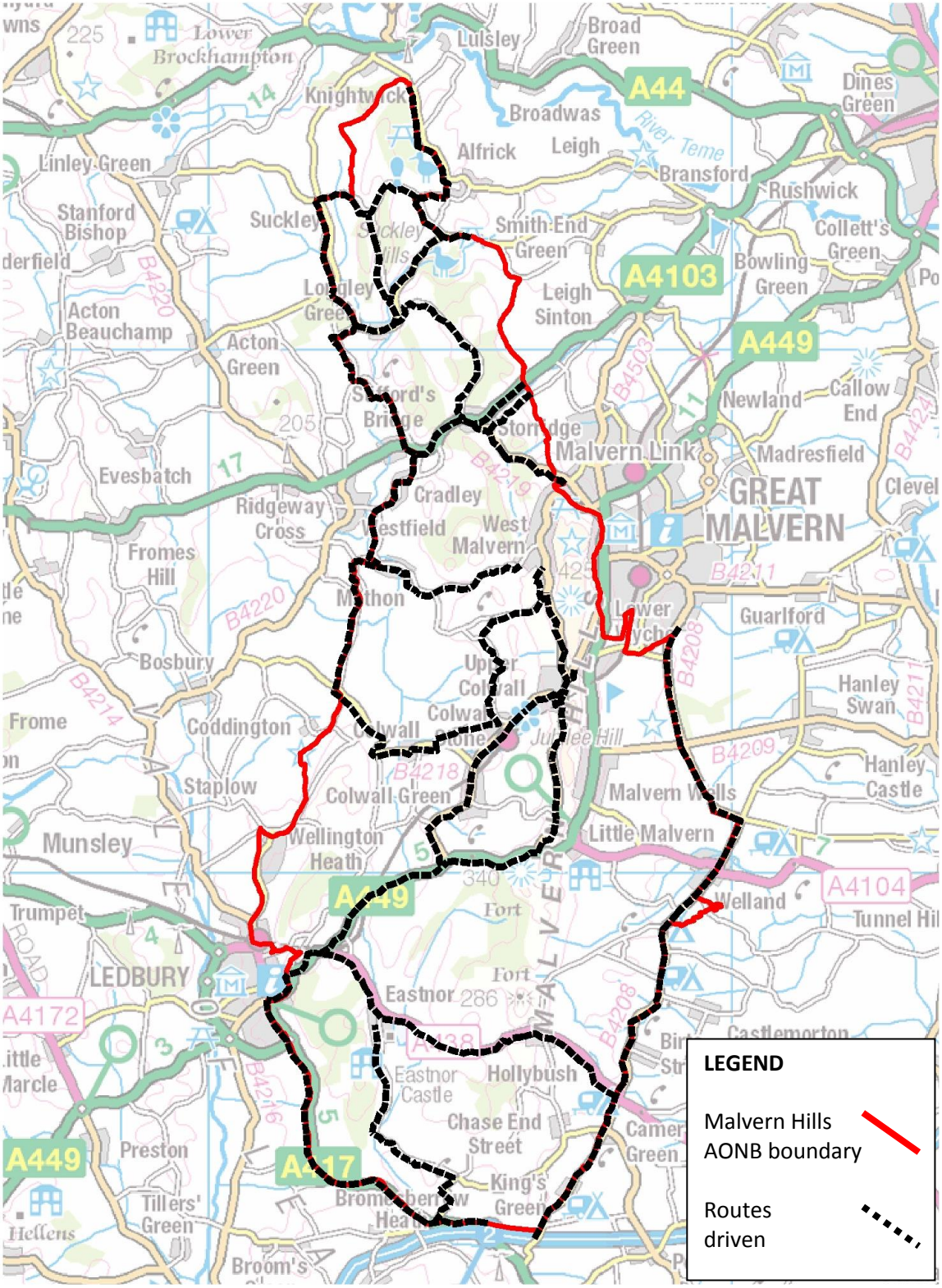
2.1 The aim of the exercise is to scope the potential impact of the disease on the landscape of the Malvern Hills AONB. It is hoped that this will lead, in time, to the development of a recovery plan for landscapes which might be heavily affected by the disease.

2.2 The objectives of the study are:

1. To estimate the distribution and significance of Ash outside of wooded areas throughout the AONB.
2. To estimate the current status of ash dieback with reference to a small sample of trees.

3. Methodology

3.1 Key routes through and around the AONB were driven by car between 16th September and 26th October 2016 (Figure 1 page 4). A total of three days was spent doing the survey. Routes travelled were broken down into roughly equal survey sections based on either 1km squares or distances between road junctions.



Malvern Hills AONB - Ash Tree Survey - routes driven

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Figure 1: Routes driven during survey work

3.2 Each section was driven slowly to enable estimation of the coverage of ash trees within hedgerows or other roadside boundaries and within fields adjacent to the road. Notes were made on the distribution and significance of ash as a component of the tree landscape and the visual prominence of ash alongside any other tree species that were also present. The proportion of young, mature and veteran ash trees was estimated.

3.3 Based on the above information a judgement was made as to what the visual impact on the landscape within that survey section might be if Chalara were to cause the death of the ash trees present.

3.4 A number of individual, prominent ash trees along the survey routes were photographed, measured (Circumference at Breast Height) and the general condition of their canopy noted. Other photographs were also taken at various locations along the survey routes.

4. Outputs

4.1 Three outputs were produced at the conclusion of the initial survey.

1. A spreadsheet containing all of the raw data

2. A series of maps illustrating the results of the survey

3. A collection of photographs

5. Results

5.1 *Estimation of the distribution and significance of Ash throughout the AONB (1)*

5.1.1 Within each survey section the **overall proportion of ash as a component of the tree cover in the local landscape** was assessed in the field and given a 'Low', 'Medium' or 'High' value.

5.1.2 This value gave consideration to not only the overall number of ash trees observed within a survey section, but also the proportion of those trees in relation to other tree species present.

5.1.3 Maps were produced to illustrate the distribution and significance of ash across the AONB based on the 'Low', 'Medium' or 'High' values. This was overlaid onto the Landscape Types dataset (see Figure 2, page 11).

5.1.4 The proportion of ash as a component of tree cover is variable across the AONB, but a correlation between a high proportion of ash and the Principal Wooded Hills Landscape Type is noticeable. However, a lot of the ash within this Landscape Type was within woodland edge-type habitat or out-grown hedgerow habitat against a backdrop of very mixed species, which may lower the visual impact of the loss of those ash trees to Chalara.

5.1.5 Ash had a tendency to be more visually significant (although less in overall individual tree numbers) as the dominant hedgerow tree species within the Settled Farmlands with

Pastoral Land Use Landscape Type in the south east of the AONB (survey sections 12 to 16) and in the southernmost part of the High Hills and Slopes Landscape Type (survey sections 19 and 20).

5.2 *Estimation of the distribution and significance of Ash throughout the AONB (2)*
5.2.1 The **significance of the visual impact to the landscape if ash was lost** from each survey section was considered and a 'Red', 'Amber' or 'Green' categorization was used to illustrate the perceived potential severity of that impact, with red being most severe and green the least.

5.2.2 The 'Red', 'Amber' or 'Green' value considered the proportion of ash tree cover alongside the prominence of those ash trees within the local landscape and therefore how significant the impact on the local landscape might be if those ash were to disappear.

5.2.3 The value given reflected whether those ash trees were young and relatively small (and potentially quite quickly replaced), or large, mature specimens that were more prominent due to their size and therefore made a visually greater contribution to the local landscape and would be more difficult to replace in the short to medium term.

5.2.4 Maps were produced to illustrate how the potential visual impact on the landscape from the loss of ash trees might vary across the AONB (see Figure 3, page 12). Predictably there was a strong correlation between those areas with a high proportion of ash trees and areas where the potential visual impact of loss was perceived to be high, but with nuances that reflect locations where ash are more visually prominent due to their relative isolation or size, even if they are not great in number.

5.3 *Estimation of the current status of ash dieback within the AONB*
5.3.1 Evidence of Chalara infection was looked for during the survey work using the guidance to symptoms published by the Forestry Commission (http://www.forestry.gov.uk/ashdieback). Any possible signs of infection were noted in the comments section of the spreadsheet and in several cases samples were taken from the tree for closer examination against photographs of confirmed symptoms. The following observations are made:

- Some crown dieback was seen on a number of trees scattered widely throughout the AONB, **however** the canopy cover and canopy condition (in terms of progress of seasonal senescence and leaf abscission) of ash was observed in general to be hugely variable throughout the survey area. Some trees were full-canopied and showed no signs of autumnal change whilst their neighbouring trees showed 100% yellowing of leaf and were starting to drop. There appeared to be no obvious trend to this in terms of size, age or exposure of the individual tree. Ash also frequently shows a 'straggly' canopy that is evidently the particular habit of an individual tree.

- A number of younger trees within the northern part of the AONB were observed to have dead, brown, 'crispy' leaves at the ends of branches, in contrast to the rest of the canopy which was still green or beginning to yellow. Samples of a number of these were collected but on inspection they showed no signs of this discolouration

extending along veins and into stems and no signs of the lesions that appear with Chalara on stems and branches. Some of the dead leaves had a powdery mildew on the surface. On balance it was thought possible that the dead leaves were related to typical autumn change and seasonal mildew infection of dying leaves.

- A small number of very young planted saplings around the railway bridge at Colwall showed signs of leaf die back and these were again examined against photographs of Chalara symptoms. No definitive conclusion was reached as to whether Chalara infection was present, however given the age of the trees and their unknown providence this is possibly an area to re-visit for further investigation. It could simply be that they are not establishing very well or had suffered during the short periods of very hot, droughty weather experienced in the preceding months.

5.3.2 Thirteen individual ash trees were examined and recorded during the survey for the purpose of establishing reference trees for monitoring any future progress of Chalara within the AONB. The size of the trees was recorded (circumference at breast height) along with an estimate of canopy cover and any evidence of pathogens. Those measured were mainly prominent roadside hedgerow trees. None showed any obvious signs of Chalara infection.

6. Limitations

6.1 The following limitations must be borne in mind when considering the results of the survey.

- The survey was not done at an optimal time of year. During the final two fieldwork sessions leaves had begun to turn although canopy cover was still in general quite intact due to mild and calm weather conditions. The progress of senescence made it slightly harder to pick out the ash trees amongst other species (which were also changing colour) but more significantly made judgements as to canopy condition and the spotting of possible evidence of ash dieback within canopies more unreliable.

- Quick progress was made by car using the survey methodology developed. However, even at lower speeds the results only gave a broad impression. More detailed surveys could be carried out on foot but this would take a huge amount more time than the three days spent.

- It quickly became apparent that the survey was a two person job given the amount of equipment that was needed (clipboard and forms, camera, GPS, maps) and the amount of attention required to make observations as each survey section was driven (it would not have been safe to require someone to both drive and make observations!).

- The application of the low/medium/high and red/amber/green values by the surveyors was subjective. The same team of two people completed the entirety of the survey work. If the survey is repeated at a later date and/or if different people are involved then more rigid and objective criteria may be needed for decision making to ensure some level of consistency.

- On some of the busier roads it was very difficult to find safe stopping places to write up results at the end of a survey section or to take photographs.

- All of the survey work was done from the road and the assessments made were based purely on what was visible from the road at car level. High hedges may have obscured views of in-field ash trees for example.

7. Quantifying the threat to the landscape of the AONB

7.1 In Europe, where the disease was first identified in 1992, countries with established rates of infection – including Poland, Lithuania and Denmark – now report up to 90% of ash trees to be infected. Since the first infection was confirmed in Britain in February 2012 in tree nursery stock imported from the European continent the disease has become established in the wider natural environment, spreading from eastern parts of the country to as far west as Pembrokeshire in south west Wales. The advance of the disease within Britain has already overtaken predictions made in 2013 within the Government's Chalara Management Plan. Evidence now indicates that windborne spores can move 20-30km per year.

7.2 Ash is the second most abundant tree species in small woodland patches within England after oak. Woodland community W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis* (ash-field maple-dog's mercury) is the dominant woodland community in Worcestershire on calcareous to neutral soils within the south and west of the county and is one of three dominant woodland types within Herefordshire. Ash is also a common hedgerow tree in both counties. Records submitted to the Woodland Trust's Ancient Tree Hunt database indicate that ash makes up 10% of the ancient and veteran trees across both Herefordshire and Worcestershire. The species is also found within 79% of all Herefordshire Tree Preservation Orders. Although there is evidence that natural resistance is beginning to emerge in some locations in Europe, Chalara still clearly has the potential to cause significant damage to the ash population of both counties.

7.3 According to publically available Forestry Commission data, Chalara infection was confirmed within SO74, which covers the central part of the Malvern Hills AONB, in 2016. The number of infections is undefined. SO73 and SO75, which cover the northern and southern parts of the AONB, do not yet have confirmed reported infections (as of 01/11/2016: http://chalaramap.fera.defra.gov.uk/). Note that SO74 covers a wider area of Worcestershire and Herefordshire than just the AONB, so confirmed infections may not actually be within the AONB boundary.

7.4 The national Chalara Management Plan published by Defra prioritises Worcestershire and Herefordshire as part of a swathe of the country where interventions to control and slow rates of infection are likely to be most cost effective. The Government has four objectives for responding to Chalara:

- **1. Reducing the rate of spread** through measures such as removing and destroying recently planted ash and replacing these with alternative species, which can be supported through the English Woodland Grant Scheme.

- **2. Developing resistance to the disease within the ash population** by taking forward a programme of research.

- **3. Encouraging citizen, landowner and industry engagement in surveillance, monitoring and action in tackling the problem** by providing advice and guidance and making use of citizen science initiatives to identify and monitor the disease.

- **4. Build economic and environmental resilience in woodlands and in associated industries** by supporting forest managers and their supply chains and undertaking research into the ecological impact of Chalara from the perspective of species dependent on ash.

7.5 Forestry Commission have published a guidance leaflet for woodland/tree owners or managers and the general public with practical advice on minimising and controlling impacts http://www.forestry.gov.uk/pdf/National_Chalara_leaflet_Feb_2016.pdf/$file/National_Chalara_leaflet_Feb_2016.pdf.

7.6 In addition to the ecological and landscape impact implications of widespread ash dieback, there are economic implications for the county in dealing with confirmed infections or trees potentially made dangerous by infection. (The economic cost to woodland managers and businesses within the forestry sector is not considered here, but could be significant). These economic implications include the costs of felling and / or removal of infected trees if they are judged to be a potential danger to the public, for example:

- Ash trees on Highways Authority land adjacent to roads or along Public Rights of Way.

- Ash trees in Local Authority owned or managed parks or other public open spaces, including street trees.

8. Suggested future work within the Malvern Hills AONB

8.1 Monitoring

8.1.1 The survey work begun in 2016 should be repeated in future years to monitor any emergence and spread of Chalara within the AONB. Recognising the constrained timescales and geographical coverage of work in 2016, future surveys could be made much more comprehensive by undertaking them on foot and covering a greater linear area using the public footpath as well as the road network. Further survey work could also entail building up the database of individual ash trees for which we have monitoring data on condition.

8.2 Awareness raising

8.2.1 Landowners and the public should be encouraged to familiarise themselves with the symptoms of Chalara and to report possible infections. Advice should be given on bio-security and what to do if infection is suspected. Landowners need to be aware of their responsibilities generally towards tree management. These measures could be achieved through:

- Distribution of Forestry Commission Chalara information leaflet (link above).

- Promoting use of the Forestry Commission 'Tree Alert' disease sighting reporting tool https://treealert.forestry.gov.uk/ (accepts reports of any tree disease).

8.3 Engaging with partners to plan ahead

8.3.1 Although Chalara infection is not yet a significant problem within the Malvern Hills AONB, the rate of spread confirmed within Britain since 2012 suggests that the disease is very likely to become more prevalent and pronounced in the area within a relatively short space of time, perhaps 5-10 years.

8.3.2 It would be advisable for those organisations which might be impacted by or involved in the management of future infection outbreaks to begin to liaise over a strategy to address the potential issues that might arise. In addition to the Malvern Hills AONB Partnership these organisations should include Forestry Commission, Worcestershire Highways, Malvern Hills Conservators, Worcestershire Wildlife Trust and Malvern Hills District Council. Other private woodland or estate owners with ash trees on their land and significant levels of public access may also wish to be involved in the conversation.

9. Sources of information

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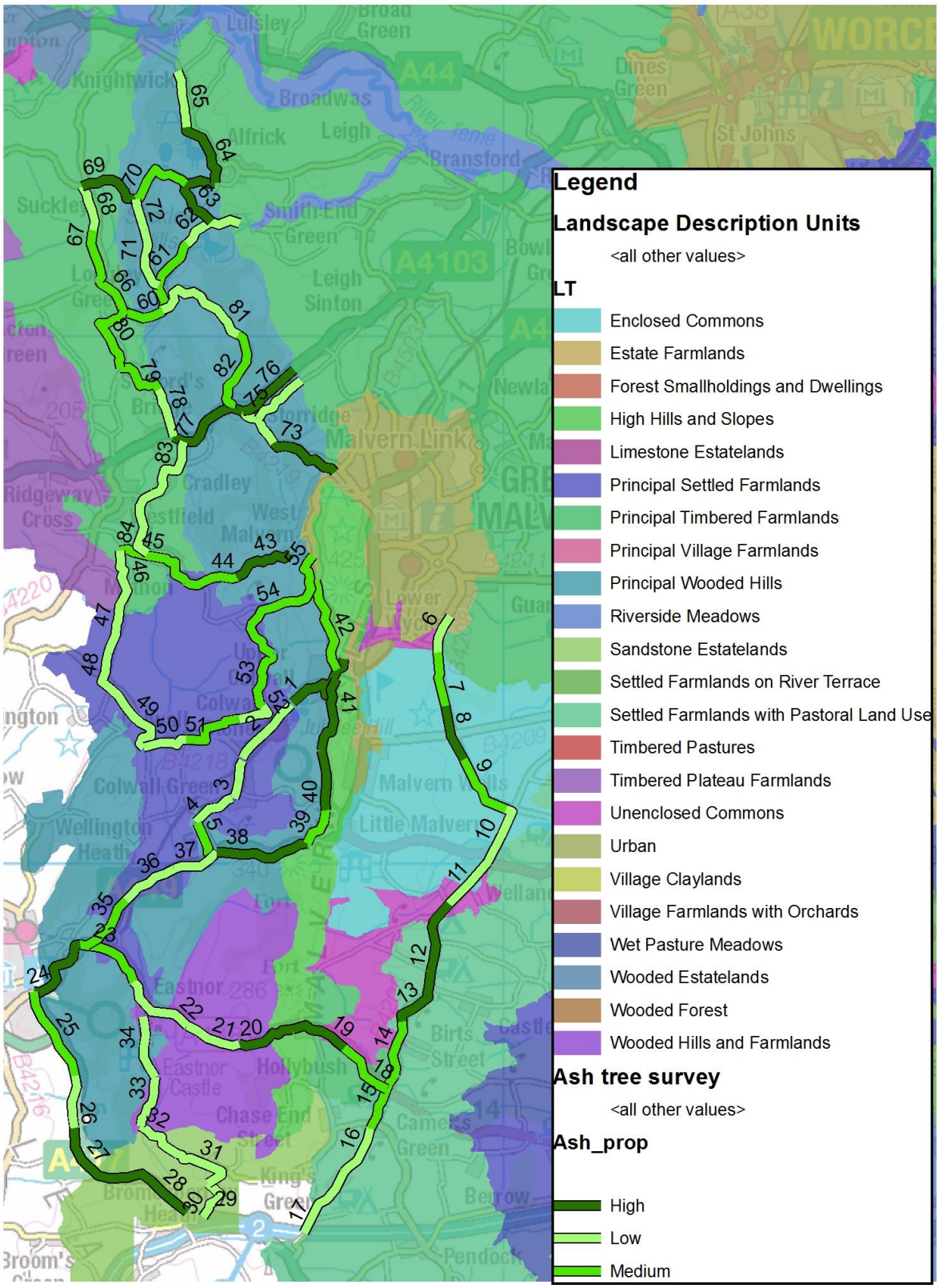

Malvern Hills AONB Ash Tree Survey_proportion of ash across Landscape Types

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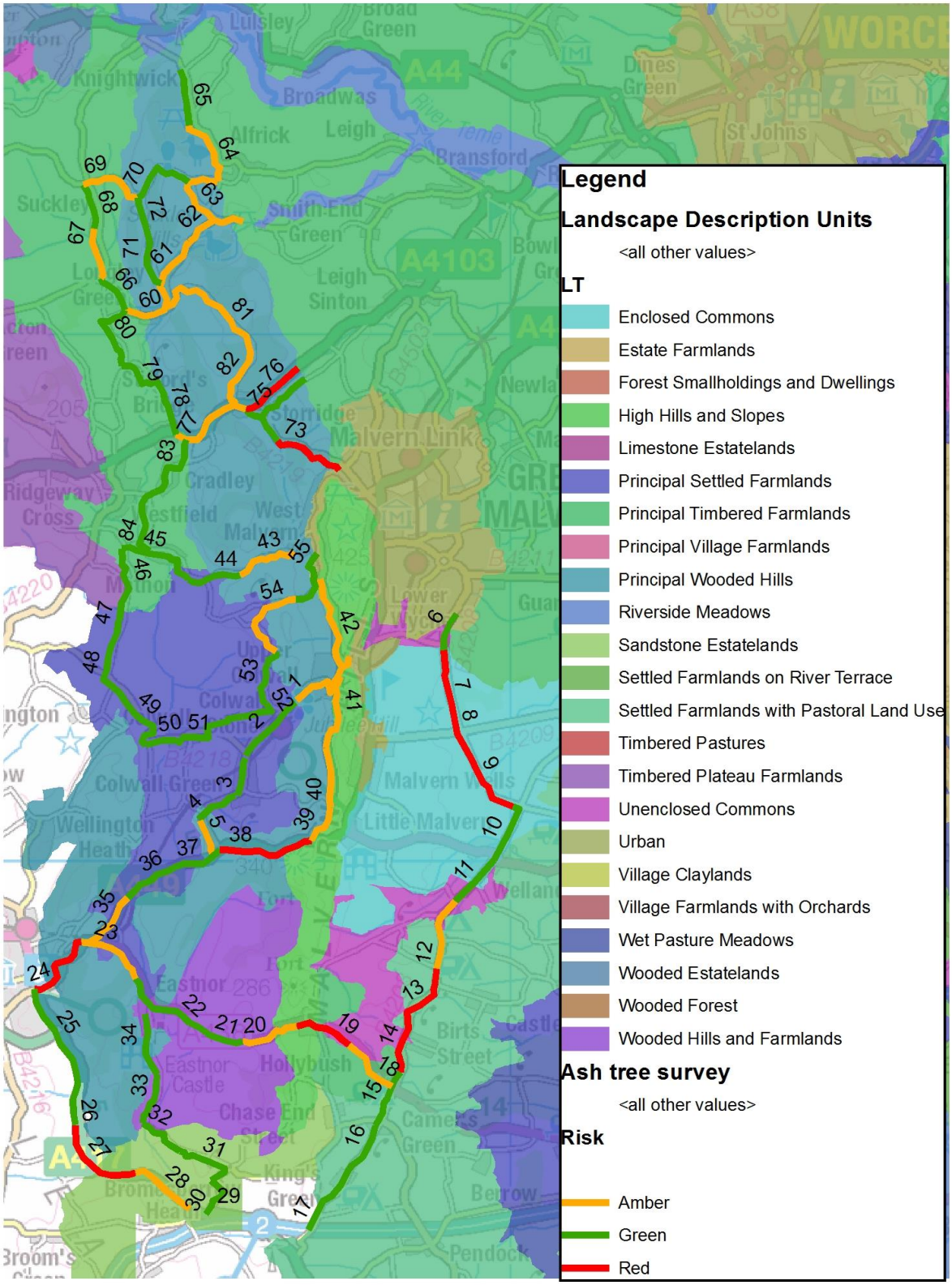
Figure 2: Proportion of ash across Landscape Types with numbered survey sections



Malvern Hills AONB Ash Tree Survey_potential impact across Landscape Types

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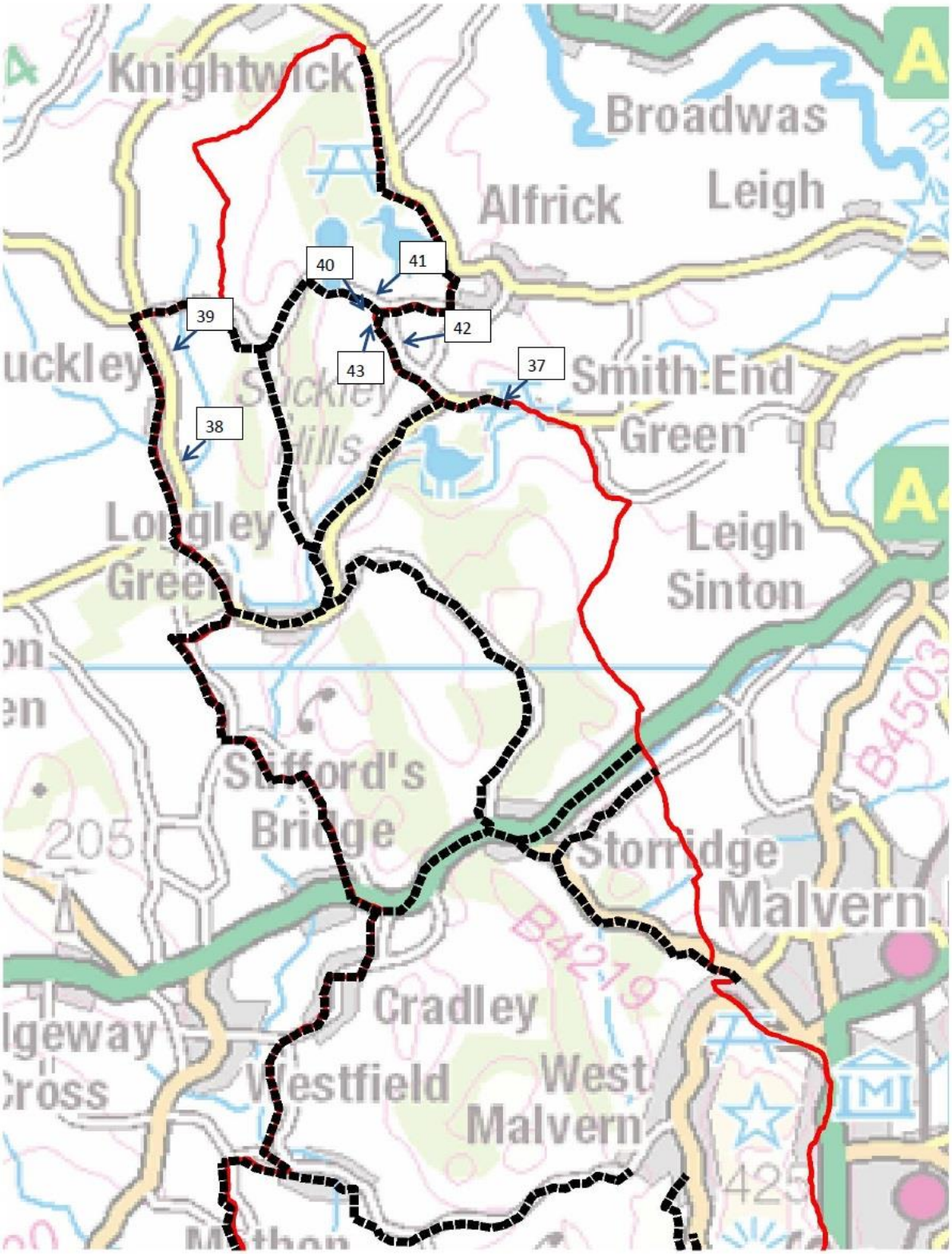
Figure 3: Potential impact of ash loss across Landscape Types with numbered survey sections



Malvern Hills AONB Ash Tree Survey_routes driven north

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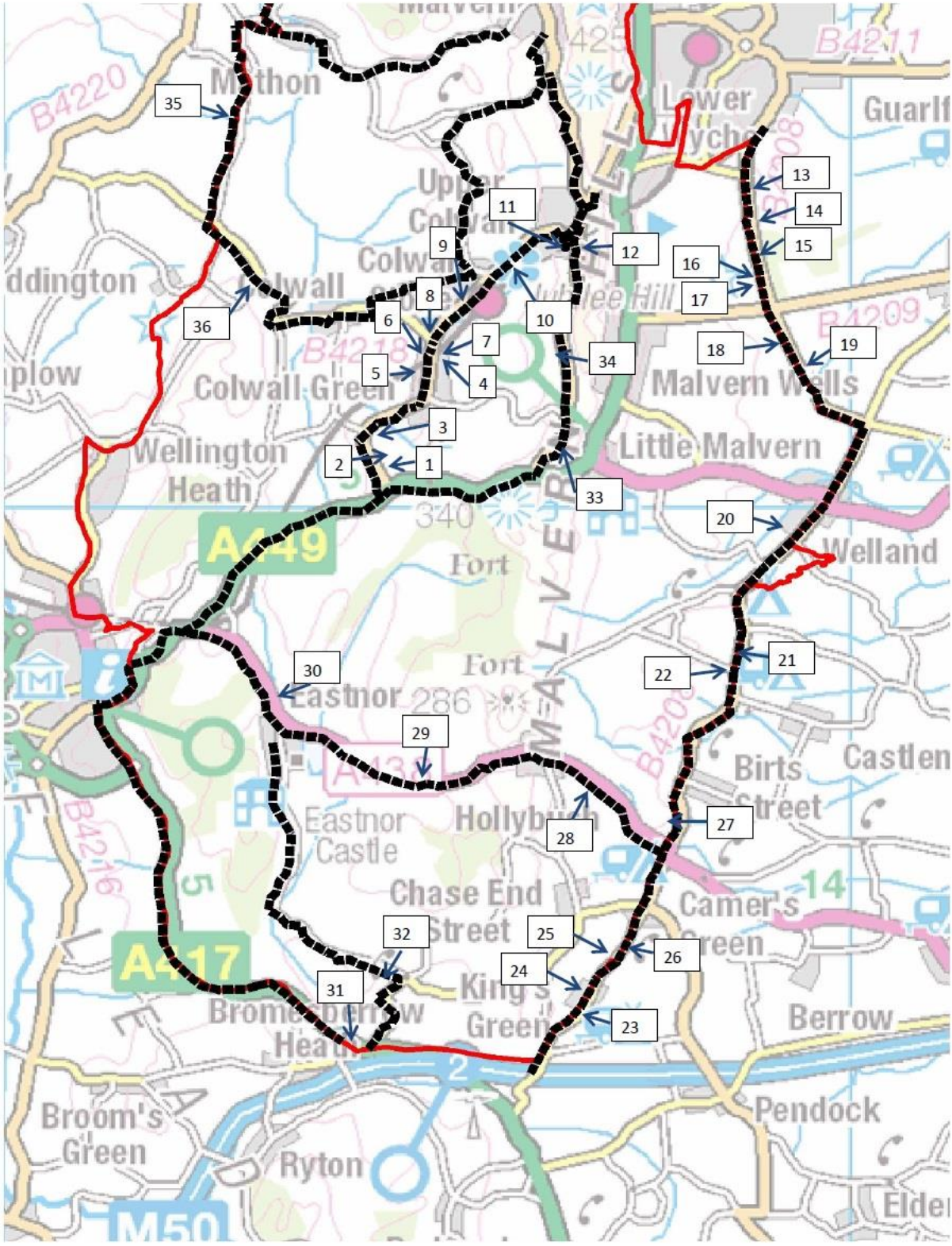
Figure 4. Photograph locations in north of survey area



Malvern Hills AONB Ash Tree Survey_routes driven south

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Figure 5. Photograph locations in south of survey area