West Sussex County Council

ASH DIEBACK DISEASE SURVEY

Highways Phase 1

70055498-AR1
NOVEMBER 2019

PUBLIC

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TYPE OF DOCUMENT (VERSION) PUBLIC

PROJECT NO. 70055498-AR1

OUR REF. NO. 70055498-AR1

DATE: NOVEMBER 2019

WSP

1 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

Phone: +44 2920 769 200

WSP.com

QUALITY CONTROL

Issue/revision	First issue	Revision 1	Revision 2	Revision 3
Date	19-11-2019			
Prepared by	Neil Davies			
Signature				
Checked by	Ross Singleton			
Signature				
Authorised by	Nicky Lear			
Signature				
Project number	70055498-AR1			
Report number	1.0			

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INTRODUCTION

1 INTRODUCTION

1.1 PURPOSE

1.1.1. The purpose of this document is to provide context and a record of the actions taken by WSP on behalf of West Sussex County Council (WSCC) in relation to Ash Dieback disease (ADB) present on the A and B road network under the care of WSCC.

1.1.2. The brief was to carry out suitable survey and produce geospatial database to allow the size and distribution of the ash tree population within the study area to be understood.

1.1.3. The survey undertaken and this report do not constitute a tree hazard assessment and it should not be used as such. Where immediately dangerous trees were encountered they were reported to WSCC as a matter of good practice and professional courtesy only.

1.1.1. Due to the scale of the survey and the methodology employed it was not possible to capture every Ash tree within survey area. For example, it was acknowledged by WSP and WSCC that trees to the rear of the wooded verge (soft estate) may not be clearly visible from the survey vehicle and as such they may not be recorded. Therefore, it is likely that the total number of Ash trees within the survey area will increase as more detailed surveys are completed.

1.2 BACKGROUND

1.2.1. First recorded in the UK in 2012, ADB is now known to be present throughout England and Wales. Large areas of Scotland are also infected. The disease is caused by the fungal pathogen *Hymenoscyphus fraxineus* affecting common ash (*Fraxinus excelsior*) and other *Fraxinus* species.

1.2.2. Dependent on local conditions, and environment, ADB can cause rapid physiological decline and early mortality in all ages of ash. This can be either as a direct result of ADB infection or via a secondary pathogen. It is not unknown for trees to die as a result of the disease within as little as four growing seasons.

1.2.3. Locations that are more favourable to spore travel such as roadside verges where ash is often prolific with relatively humid conditions (caused by road spray for example) are more prone to ADB. Such areas may also be susceptible to seasonal drought (on engineered banks for example) or other such stresses that can impede the trees ability to withstand infection.

1.2.4. Ash infected with ADB typically display crown decline resulting in deadwood at height that may be within striking distance of a target such as a road. Anecdotal evidence gathered by WSP from contractors working in South Wales, South West England, Lincolnshire and Southern Scotland suggest that infected ash trees become unpredictably brittle in structure increasing the threat to the safe use of surrounding features. There is no cure or treatment for the disease.

1.2.5. Aware of their responsibilities as land owners and route managers, WSCC approached WSP for guidance and support in understanding the extent of the potential problem within their land holdings. The Highway estate was considered a priority. In particular A and B roads were targeted. Trunk roads within the county are the responsibility of Highways England and so were discounted from this work.

1.3 BEST PRACTICE

1.3.1. When considering the potential threat posed by ADB and how to manage that threat, there are two primary areas of guidance as follows;

"Common Sense Risk Management of Trees" (2011) National Tree Safety Group (NTSG)

1.3.2. The NTSG consists of roughly 20 organisations including arboriculture and forestry industry trade organisations, organisations that represent large private land owners, and large charitable land owners such as The National Trust. The NTSG guidance was published in 2011 and although does not have any legislative status, it was published by the Forestry Commission and was endorsed by the Health and Safety Executive and is thus taken as representing 'best practice'.

*The NTSG (*National Tree Safety Group – Common Sense Risk Management of Trees, Forestry Commission, December 2011) *believes that one fundamental concept should underlie the management of risks from trees. It is that the evaluation of what is reasonable should be based upon a balance between benefit and risk. This evaluation can be undertaken only in a local context, since trees provide many different types of benefit in a range of different circumstances*.

1.3.3. The NTSG sets out a risk management process to allow a transparent and consistent approach to evaluating the benefit of trees alongside the potential risk they pose. The process consists of five steps.

- Context, how do these trees benefit their environment?
- Risk identification, do the trees pose a threat to the safe use of that environment?
- Risk analysis, what is the severity of the risk?
- Risk evaluation, is this risk acceptable?
- Risk treatment, what remedial action is required to preserve the benefits of the trees while also reducing the risk to an acceptable level?

1.3.4. Importantly, the NTSG state that the level and extent of tree hazard management should be commensurate with the scale of organisation. That is, a home owner with a single tree in their garden is not expected to carry out the same level and detail of inspection as the National Trust (for example) who have the resources to employ specialists to manage tree hazard.

"Ash Dieback: An Action Plan Toolkit" (2019) The Tree Council

1.3.5. The Tree Council is a charitable organisation. Established in 1973 the Tree Council's intent was to be the umbrella body for UK organisations involved in the conservation planting and care of trees. Their membership consists of a range of professional specialists, local authorities, conservation charities, non-governmental organisations and government bodies.

1.3.6. The Tree Council published their initial action plan tool kit in February 2019. In a similar way to the NTSG, the Tree Council have provided a pragmatic approach to managing outcomes of ADB. Their toolkit has four parts that cover the entire management process ranging from baselining the potential scale of the problem to developing a recovery strategy post disease / remedial action. For the purposes of this document and the work completed to date, the focus is on part one, "Raising Awareness" which has three steps as follows;

- Step 1, Learning about ADB. What is the disease, how to identify it and where is it?
- Step 2, Assessing the Impact. How many Ash trees are in your area, collecting data, what are the potential costs?
- Step 3, Making a case for an ADB action plan. What is the extent of corporate risk, health and safety risk, economic and environmental impacts and reputational damage?

1.4 SURVEY METHODOLOGY CONSIDERATIONS

1.4.1. WSCC prioritised their highway network as this is area of their land holdings that is most likely to have the highest population of ash and is most susceptible to ADB. It was decided that A and B roads would be included within the study area.

1.4.2. In accordance with best practice above, the first step is for WSCC to understand the scale of the potential problem within the study area. With this in mind the task was to locate and record ash trees within the highway verge.

1.4.3. As ADB is a progressive disease, it is beneficial to obtain a visual record of the trees canopies for cross reference in future years. In order to effectively manage and track ADB in their area, a geospatial mapping solution was also required.

1.4.4. The following were possible solutions along with some of the 'pros' and 'cons';

Walk over survey

- Time consuming over large areas
- High Health and Safety risk for surveyors and road users
- Potential delay / disruption to road users where traffic management is required to ensure safety of surveyors
- Considerable additional cost for planning and installing and managing traffic management
- Can move easily within roadside vegetation to locate ash trees not easily visible from the road

Digital survey

- Carry out desk top assessment using high resolution aerial imagery combined with National Tree Inventory (NTI) data and Natural England (NE) available lidar data.
- Reduced health and safety risk on site
- Expensive set up / data collection
- Potential data handling storage issues
- Would still require elements of ground truthing / calibration with walk over surveys

Drive by survey

- Due to line of sight from vehicle, not all ash trees will be visible / recorded.
- Can cover large areas in relatively short time
- Does not require traffic management
- Significantly reduced health and safety implications for surveyors and road users
- May not be as accurate as walk over survey
- Vehicle mounted digital device can be used

1.4.5. WSP worked with WSCC in reviewing the above options and jointly developed a drive by methodology that was cost effective, maintained an acceptable level of risk to the survey team and provided a robust data set upon which to plan future management of ADB in the WSCC highways estate.

2 METHODOLOGY

2.1 PRE-SURVEY METHODOLOGY

2.1.1. Survey routes were provided to WSP by WSCC. The routes were uploaded to a geospatial database to allow effective survey planning and monitoring. This included

- Timings to avoid peak traffic in urban areas
- Routes to be surveyed while driving into and out of county from base
- Division of survey area between teams
- Potential areas to remove from the survey due to lack of tree population
- Avoiding overlap between teams and completed areas
- Confirmation of total route completion
- De-scoped areas such as trunk roads
- County boundary

2.1.2. Prior to the start of the onsite survey, a test route was used to identify any potential issues with the proposed methodology and equipment. No significant issues were encountered

2.1.3. The survey relied upon trees being in leaf (as far as disease allowed) and as such a survey window of approximately May to September was agreed.

2.2 SURVEY METHODOLOGY

2.2.1. The site survey consisted of two vehicles in appropriate highway maintenance (Chapter 8) hi-viz livery with amber beacons, each with two staff. One person would drive while the second operated two “Gopro” type cameras mounted to the inside of the windscreen. To avoid fatigue, roles were swapped throughout the survey.

2.2.2. Camera one recorded high resolution video of the surveyed route. Camera two was used to take high resolution photographs of each ash tree observed from the passenger seat of the van.

2.2.3. Camera two was enabled with GPS and as such each photograph taken had time, date and GPS location automatically recorded.

2.2.4. The camera was triggered by Bluetooth remote which allowed the operator to sit comfortably while taking photographs without obscuring the driver’s field of view or use of mirrors. The time delay between pressing the remote button and the camera taking an image was insignificantly small.

2.2.5. While surveying, the vans travelled at no more than 30mph. This speed permitted accuracy of triggering the camera where ash trees were noted, allowed reasonable progress through the survey area and did not present a hazard to other road users.

2.2.6. Photographs and video records of the survey were backed up once the memory card was full and / or at the end of each survey day. Backups were held on a remote server and on external hard drives with the survey team.

2.2.7. Where trees were found to pose an immediate threat to the safe use of the highway they were reported to WSCC. A photograph, location and description of the hazard were provided to aid identification and allocation of appropriate resource to carry out remedial works.

2.3 POST SURVEY METHODOLOGY AND QUALITY ASSURANCE

2.3.1. Survey data including photographs and video were processed as follows;

- All images collected were run through “an executable” to extract GPS location, file location and actual time image taken.
- The GPS data was then converted into decimal format and geolocated into GIS as a point dataset.
- Multiple desktop / digital quality assurance (QA) processes were undertaken on the data.
- These QAd image location points can be appended to the WSCC network.

2.3.2. Within the database, the surveyed highway network has been split into road link references, coloured by ash tree count per road link. This is to enable simple identification of the areas where ash is most prolific. The data has also been overlaid on the WSCC highway ownership layer where available. An extract of this is shown at appendix A.

2.3.3. To aid desk top technical review, the data set was converted to a Google Earth file. The tree locations were then observed in aerial imagery to check location and from street view to confirm species. The Google Earth file also allowed simple identification of any areas where there appeared to be gaps or fewer than expected trees were recorded.

2.3.4. Based on the results of the desk top review, locations for site QA visits were planned, these consisted of several areas in the West of the county, Chichester area in the centre and Crawley area in the North East.

2.3.5. QA consisted of assessing the following items

- Surveyors’ compliance with scope and health and safety plan
- Surveyors’ handling of data and data transfer
- Surveyors’ ability to capture appropriate trees
- Appropriateness of survey methodology for changing road conditions in urban and rural areas
- First hand review of areas with fewer or no trees recorded
- Appropriateness of vehicle and the surveys impact on traffic

2.3.6. The completed and QAd dataset will be provided to WSCC with hyperlinks to photos.

3 RESULTS CONCLUSION AND NEXT STEPS

3.1 RESULTS

3.1.1. Key points of note are listed below

- Within the study area, approximately 11,500 ash trees recorded (adjacent to A and B roads).
- Ash trees are present on all roads surveyed. The population density is lower in built up areas and along the coast as expected. This is a reflection of the species characteristics and its lack of favour in urban planting schemes
- Where reasonably visible from the vehicle, the survey captured trees up to 20m from the road. This varies throughout the survey depending on topography, road layout and density of roadside vegetation.
- An accuracy of approximately +/- 1m in GPS locations recorded was generally achieved. This level of accuracy should be more than sufficient for follow on works to readily identify the location of ash trees.
- The trigger button used to record photographs occasionally “misfired” causing a burst of 30 photographs to be taken in very quick succession. This was resolved in the post survey review of data by producing “an executable” that used the time date and GPS attributes to calculate where the bursts had occurred and discount those that were not required. The originals have been kept in the data upload as backup.
- Approximately 80% of ash recorded displayed obvious symptoms of ADB when viewed from the survey vehicle. Approximately 50% of these trees are at an advanced stage of decline.
- Trees under approximately 3m tall were not recorded as they are not likely to pose a significant threat to the safe use of the highway.
- The QA process found that all elements of scope and health & safety had been fully complied with. Furthermore, an accuracy in recording (level of confidence) of 95% has been achieved. Although not included within scope, the A27 within WSCC has been recorded as it was used heavily to access other sections of the study area. It is worth noting that the ash on the A27 displayed a higher level of infection than other routes. This is commensurate with other trunk roads observed throughout the UK.

3.2 CONCLUSIONS

3.2.1. The survey has been completed incident free, and has provided robust results that can be used as a foundation for future phases of works.

3.2.2. The innovation used in developing this new survey method has now been fully tested and found to be perfectly capable for its intended application.

3.2.3. Unfortunately, the extent of the disease within the county was unsurprising. The disease is present in all sections of the survey area where ash is recorded.

3.2.4. The roads with highest recorded populations of ash are:

- B2146 from Lordington to South Harting
- B2141 from East Lavant to South Harting
- A286 from Singleton to Midhurst and Petworth to Haslemere
- A285 from Boxgrove to Petworth

- A283 from Washington to near Steyning to Partridge Green
- A272 from Petworth to Wisborough Green

3.3 NEXT STEPS

3.3.1. In accordance with the good practice outlined by the NTSG and Tree Council, now that we understand where the ash trees are within the study area, we need to begin to understand their condition and therefore determine the potential threat they may pose to the safe use of the highway network within the study area.

3.3.2. The photographic and video record will be of great use to understand the advancement of the disease where found in the coming years but a baseline needs to be established. To that end a desk based review of the photographs recorded will be undertaken over the winter of 2019/20.

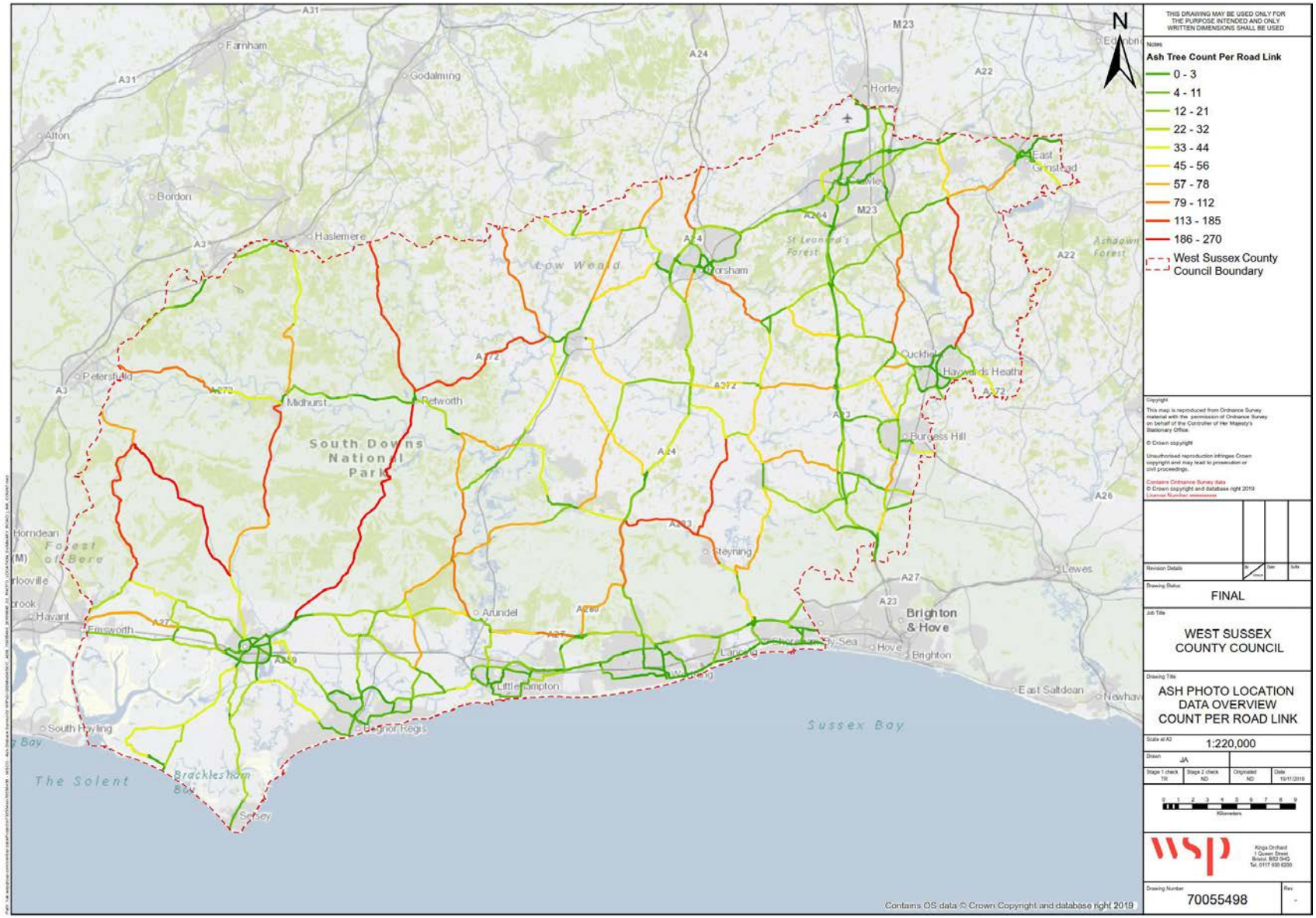
3.3.3. The desk based study will review each of the 11,500 photographs and appoint a risk category for dieback in accordance with the Tree Council's published guidance. The dieback category will be recorded in the attributes attached to each tree position recorded.

3.3.4. This approach will enable the WSCC to understand which areas have the highest ash populations and the most infected populations. This can be combined with traffic data and other such resources from WSCC to enable priority zones for further detailed survey to be established.

3.3.5. This work has been instructed and is underway within WSP. It is anticipated that the results will be released in January 2020. Regular updates on any trends found during the process will be communicated to WSCC.

Appendix A

ASH POPULATION DENSITY BY ROAD


THIS DRAWING MAY BE USED ONLY FOR THE PURPOSE INTENDED AND ONLY WRITTEN DIMENSIONS SHALL BE USED
Notes
Ash Tree Count Per Road Link
0 - 3
4 - 11
12 - 21
22 - 32
33 - 44
45 - 56
57 - 78
79 - 112
113 - 185
186 - 270
West Sussex County Council Boundary
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Revision Details
Drawing Status
FINAL
Job Title
WEST SUSSEX COUNTY COUNCIL
Drawing Title
ASH PHOTO LOCATION DATA OVERVIEW COUNT PER ROAD LINK
Scale at A3
1:220,000
Drawn
JA
Stage 1 check
TR
Stage 2 check
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ND
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1 Capital Quarter
Tyndall Street
Cardiff
CF10 4BZ

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