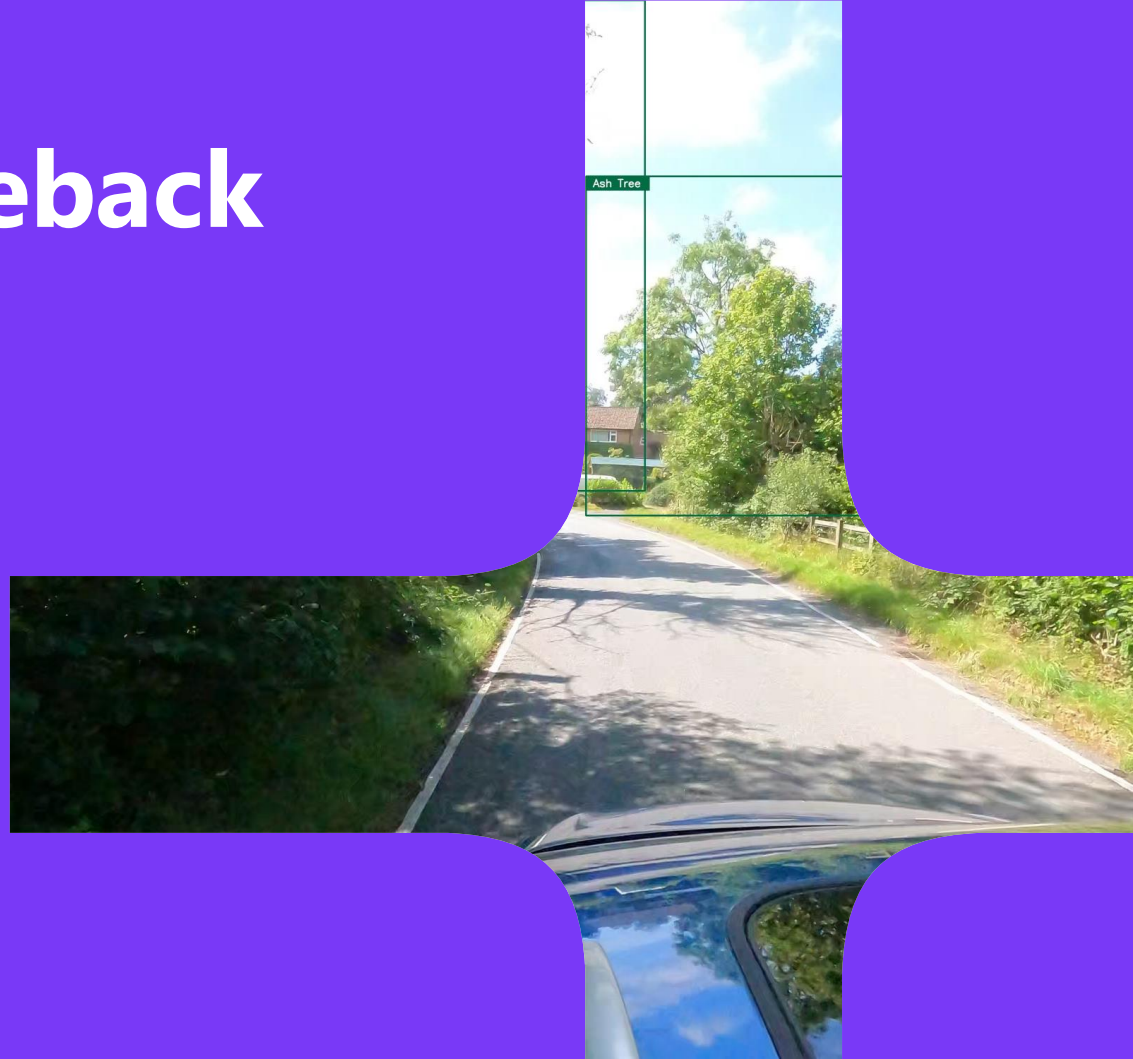


Moata Ash Dieback

Ash Dieback on the Highway Verge

IDA@mottmac.com



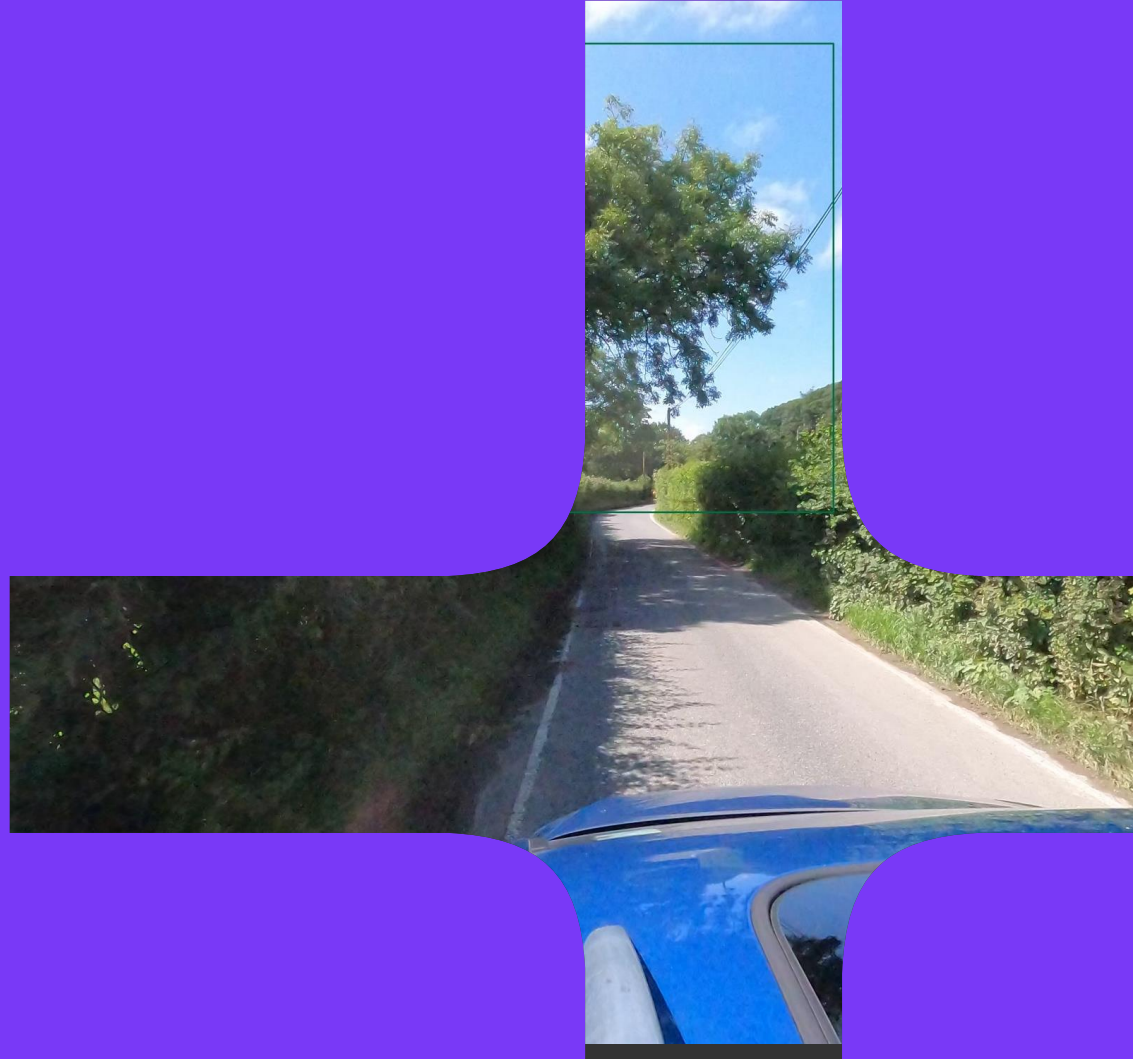
Contents

- 1. Brief overview of ash dieback**
- 2. Challenges around collecting survey information for ash dieback**
- 3. Moata Ash Dieback – Vehicle-borne mapping of ash trees**
- 4. Conwy County Borough Council – Value extracted from the Moata Ash Dieback outputs**
- 5. Overview of other solutions**

IDA@mottmac.com

Ash Dieback

IDA@mottmac.com



What is ash dieback?



Images from left: © Rob Wolton, Jon Stokes



Change in tree over one season¹

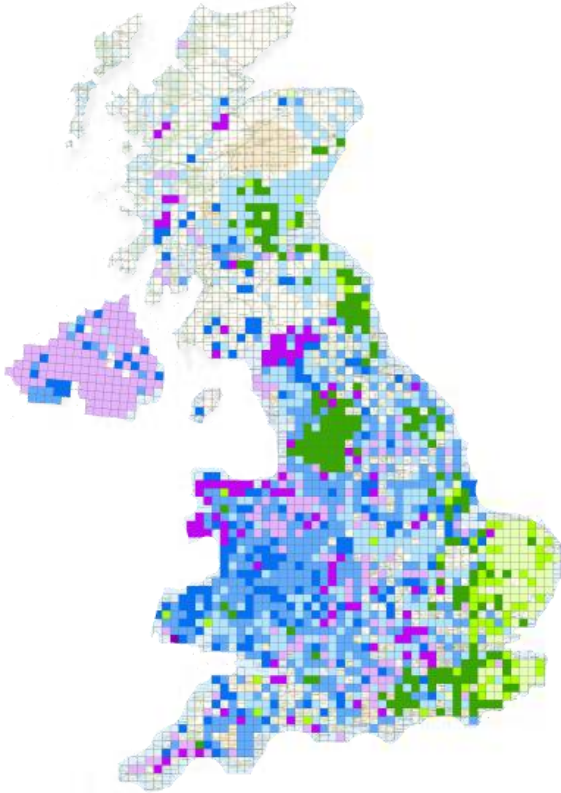
Map of ash dieback in 2014²

1. The Tree Council (2019). Ash Dieback: An Action Plan Toolkit. [Link](#). [Accessed 10th March 2022].
2. Forestry Commission (2014). [Link](#). [Accessed 10th March 2022]

What is ash dieback?



Images from left: © Rob Wolton, Jon Stokes



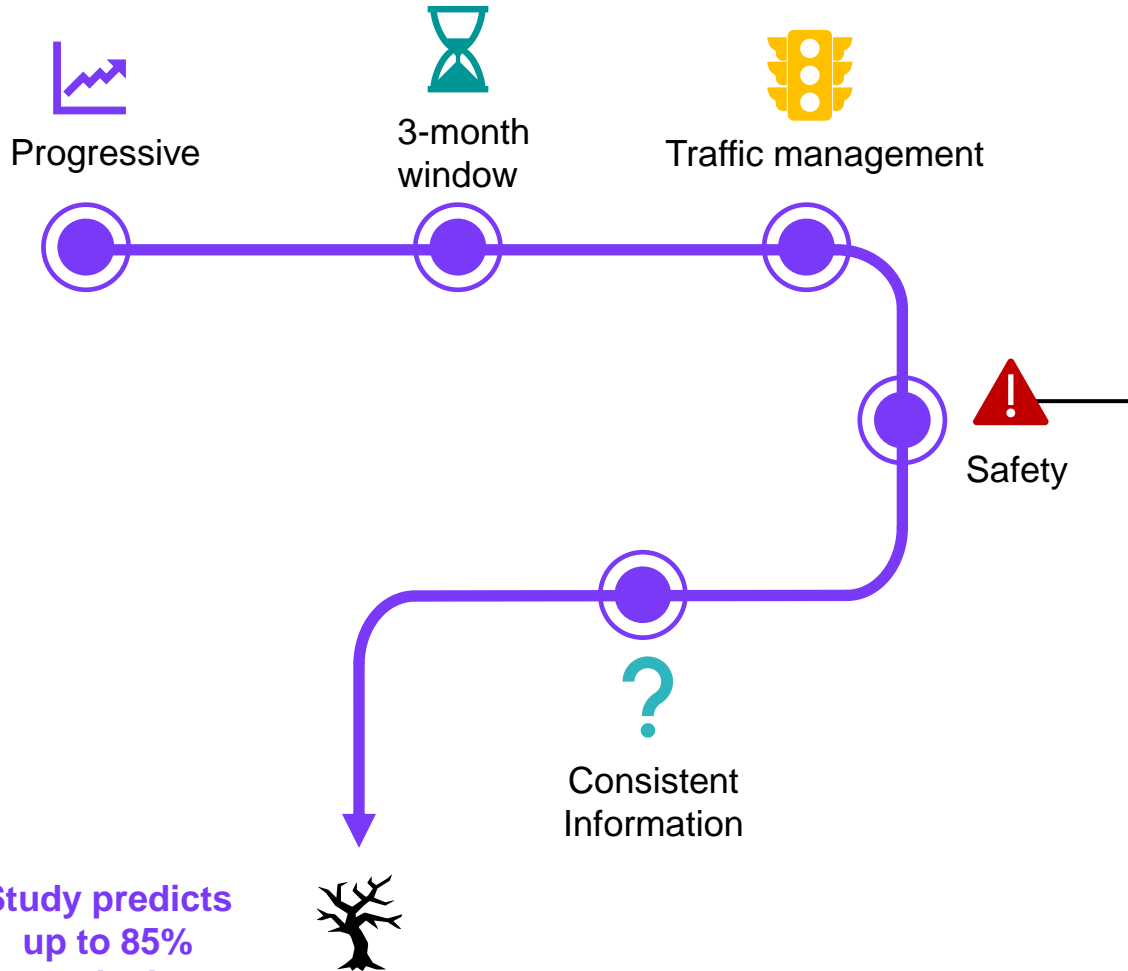
Change in tree over one season¹

Map of ash dieback in 2020²

1. The Tree Council (2019). Ash Dieback: An Action Plan Toolkit. [Link](#). [Accessed 10th March 2022].
2. Forestry Commission (2020). [Link](#). [Accessed 10th March 2022]

Challenges with ground surveys

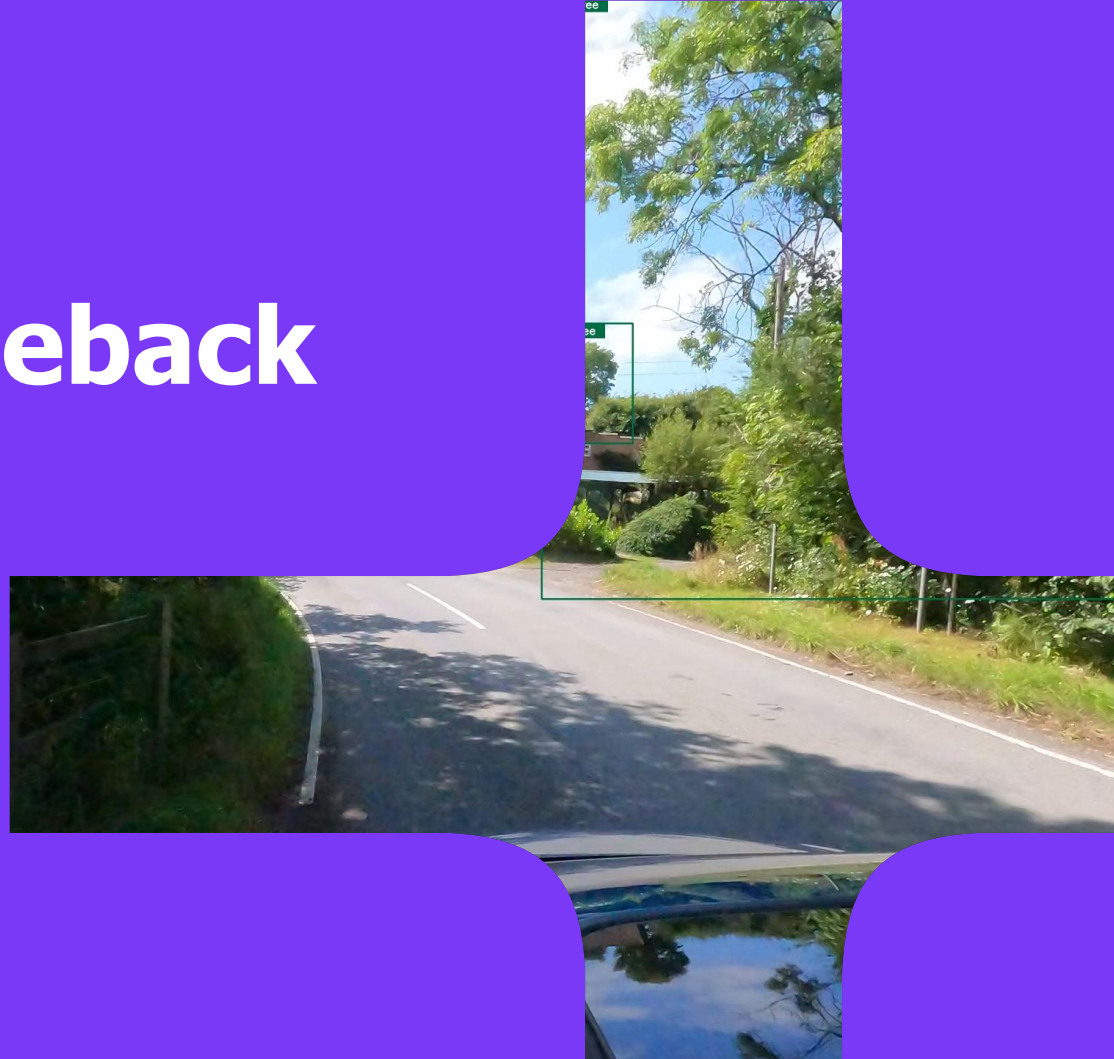
Are we keeping pace with the disease?



1. T. Coker et al (2018). Estimating mortality rates of European ash (*Fraxinus excelsior*) under the ash dieback (*Hymenoscyphus fraxineus*) epidemic. *Plants People Planet* Vol.1 Issue 1.

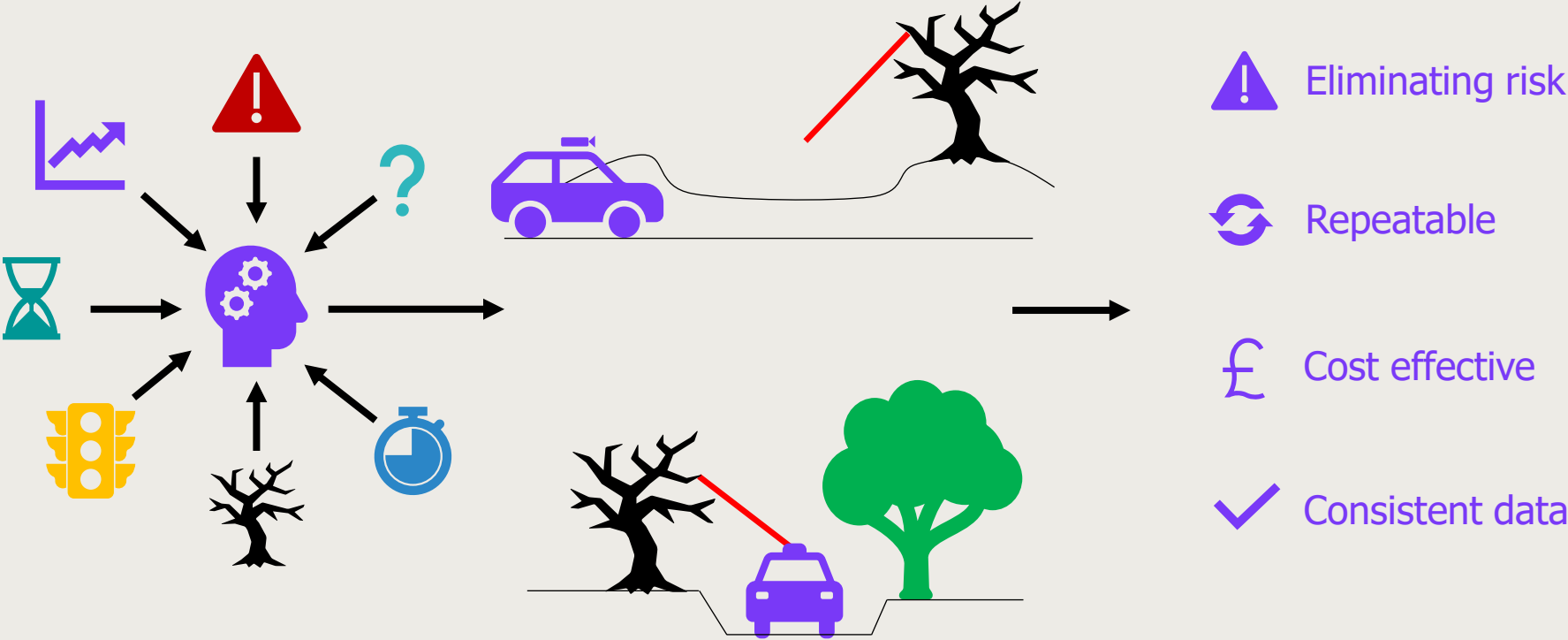
Moata Ash Dieback

IDA@mottmac.com



Moata Ash Dieback

System designed to be repeatable and cost-effective to keep pace with disease



Moata Ash Dieback

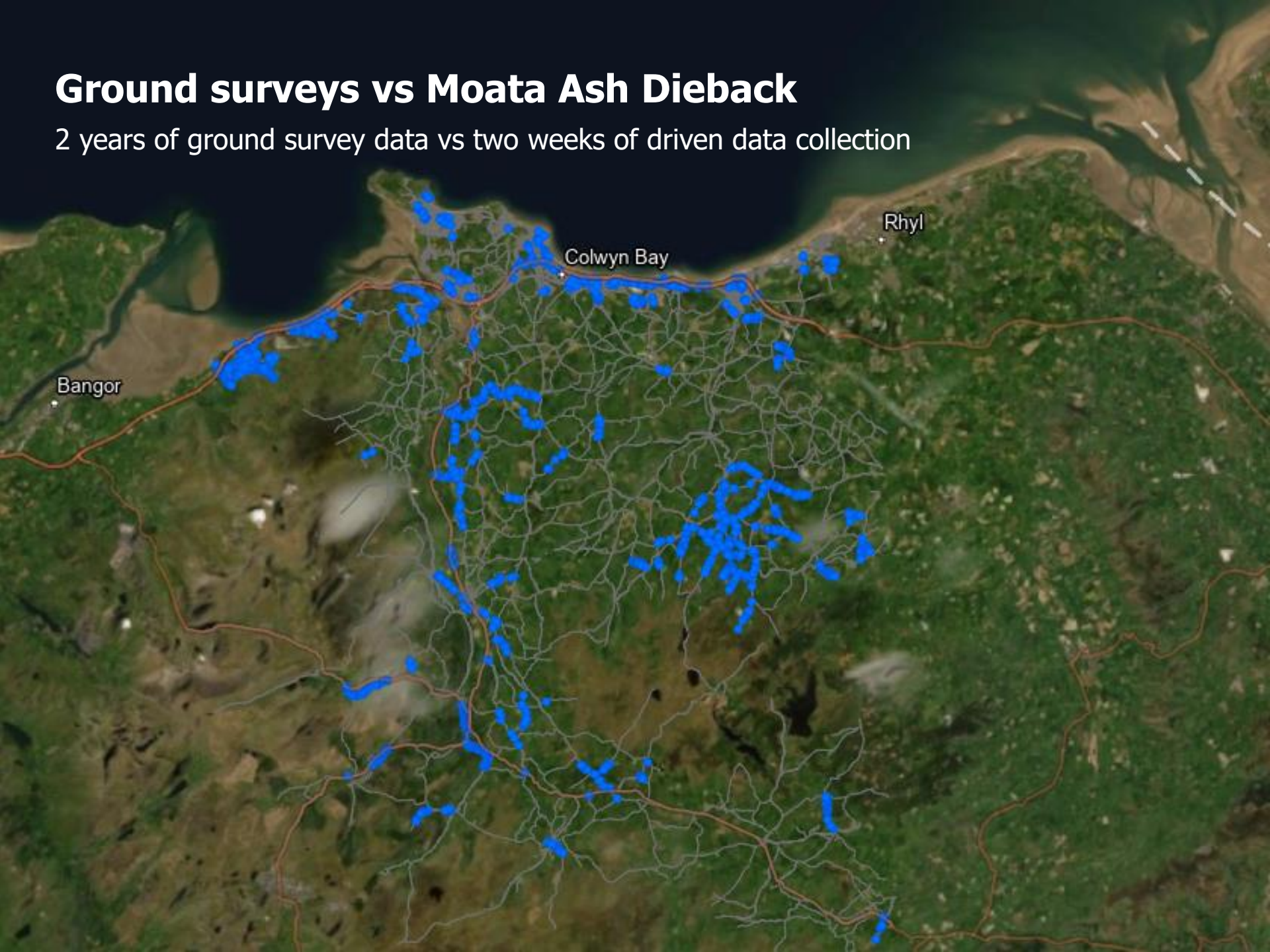


Moata Ash Dieback



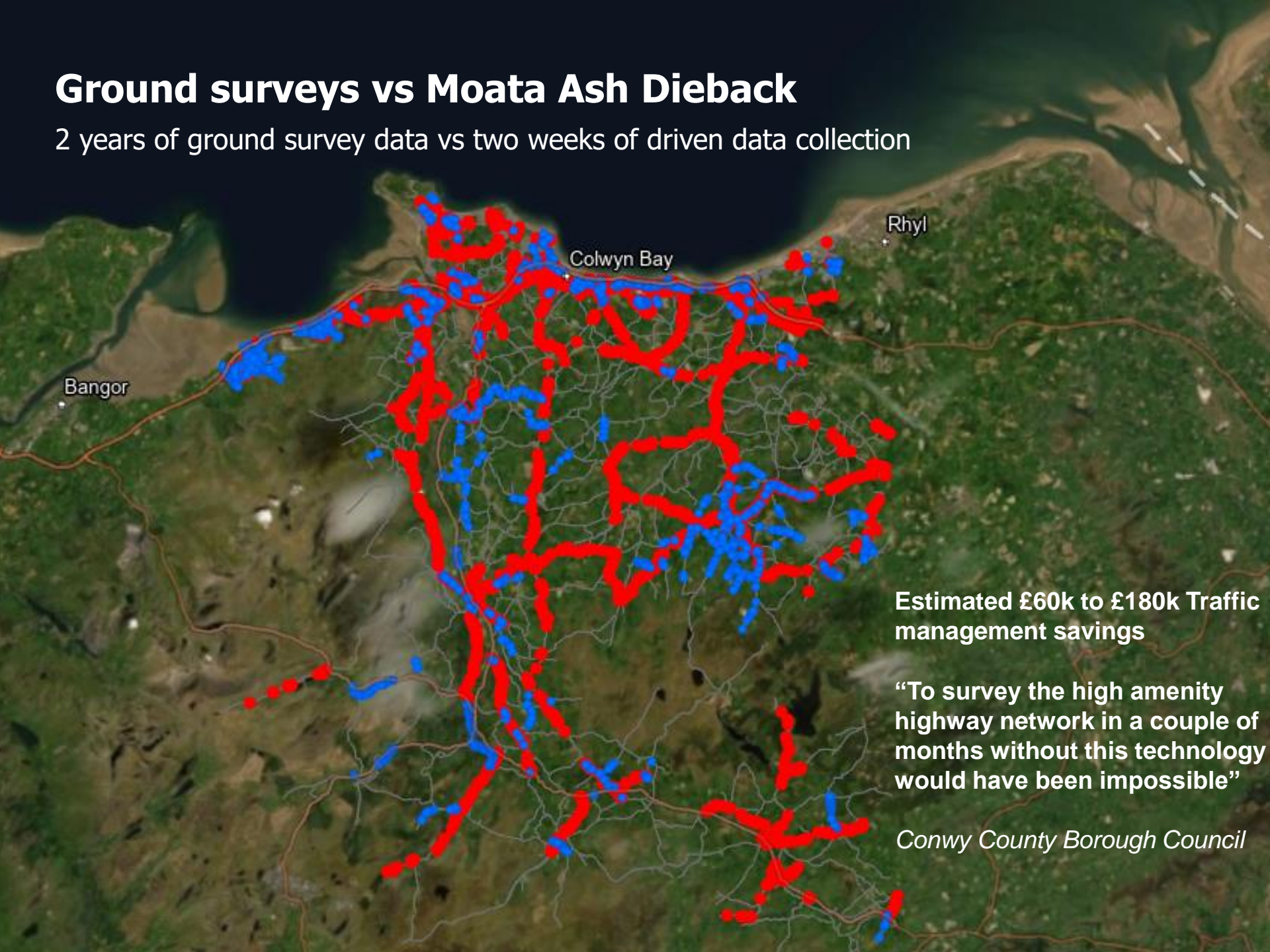
Ground surveys vs Moata Ash Dieback

2 years of ground survey data vs two weeks of driven data collection



Ground surveys vs Moata Ash Dieback

2 years of ground survey data vs two weeks of driven data collection



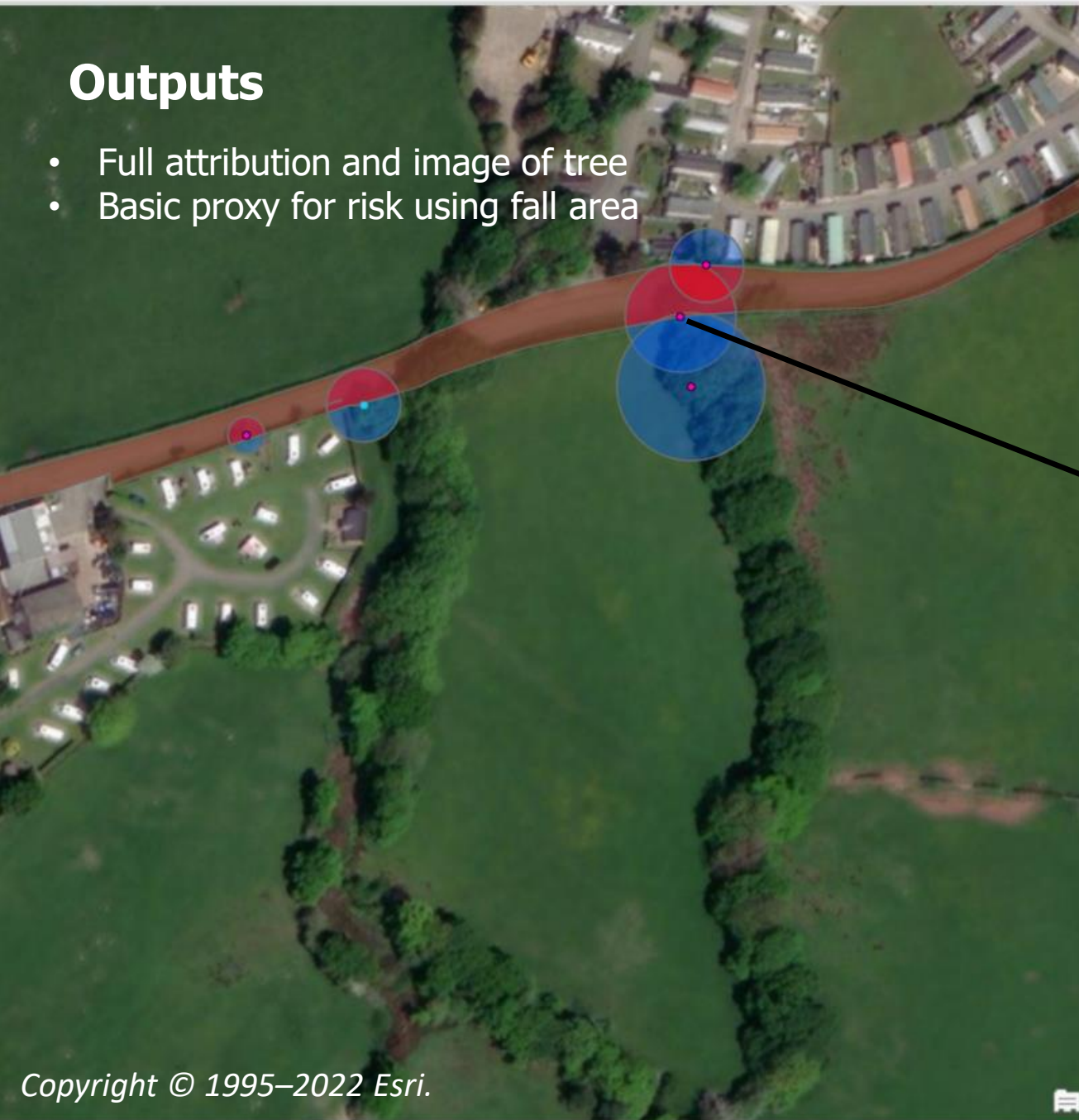
Estimated £60k to £180k Traffic management savings

“To survey the high amenity highway network in a couple of months without this technology would have been impossible”


Conwy County Borough Council

Outputs

- Full attribution and image of tree
- Basic proxy for risk using fall area



Attributes



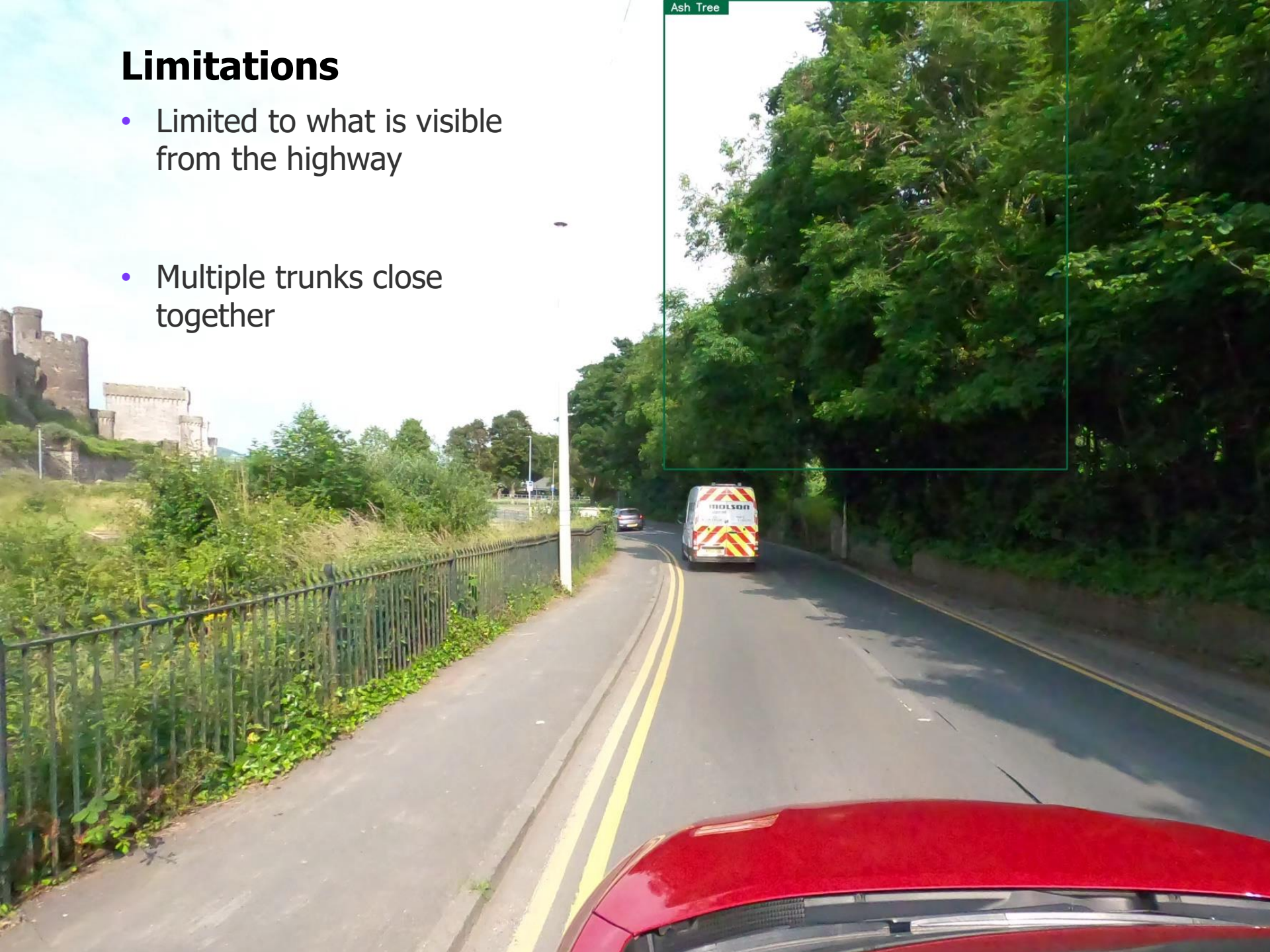
Attributes	Geometry	Attachments (1)
OBJECTID		3435
id		3435
Degree_Of_		Up to 50%
MM_Tree_He		10
NTM_Max_He		7
Absolute_M		10
Height_of_		10 - 15m
Coincident		Yes
NTM_Catalo		NTM_SH97SW_293861_374027
MM_Catalog		3435
Eastings		293861
Northings		374030
FallArea		144
Ownership		Private
Final_path		\\gb010587mm\ash_dev\data\data_
Coincident Conwy Record		No
Conwy Record ID		<Null>
NEAR_FID		98809
NEAR_DIST		0

Auto Apply Apply Cancel

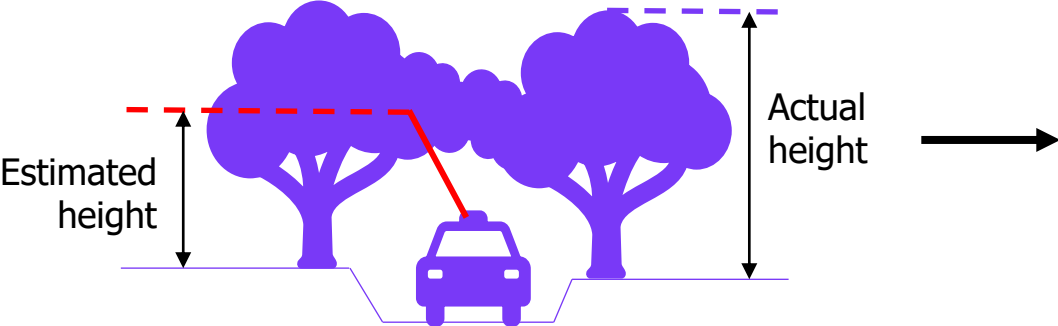
Catalog Modify Features **Attributes**

Limitations

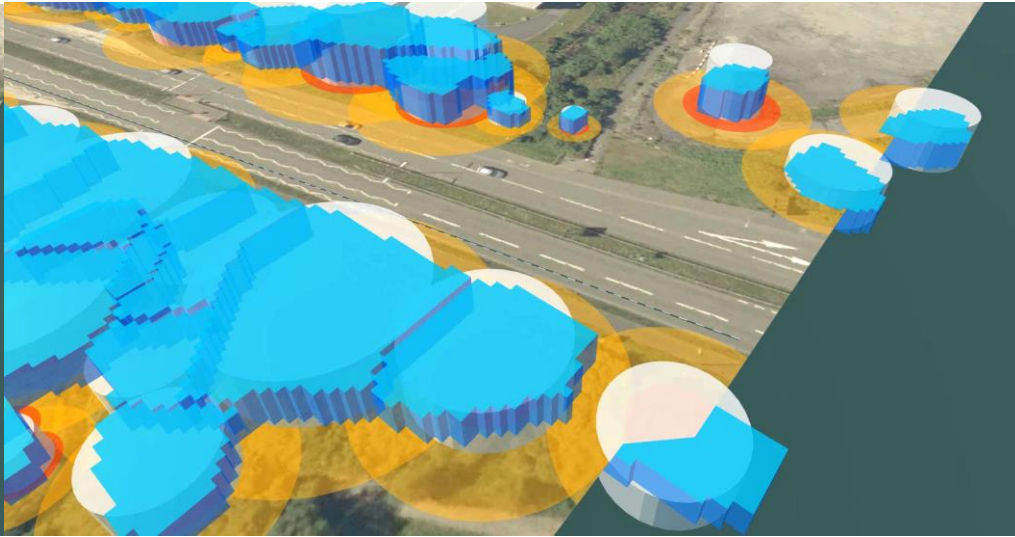
- Limited to what is visible from the highway
- Multiple trunks close together



Validating Height and Location



**Digital terrain
and surface
models**



Part of a Wider Solution

Current capabilities represent a first step



Ash Dieback in Conwy

Sophie Birchall-Rogerson

CCBC ADB Project Manager

Conwy's Journey

2018 – ADB discovered

Most populous tree across North Wales

Scale????

Threat???

Cost???

UNKNOWN!




Existing Data

Exit Desktop Map Options Functions Previous Next Create Amend Confirm Cancel

Summary | Details | Attributes | Updates | Links | Contacts | Co-ordinates | Activities | Survey | Index Groups | Objects

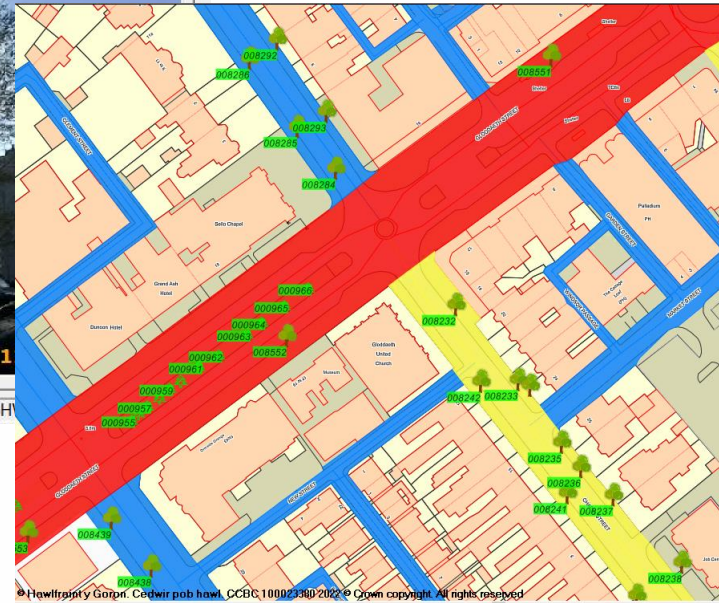
Address CHAPEL STREET LLANDUDNO Section CCBC C/01156
 Location CHAPEL STREET
 Unit Type TREE Unit No. 8232 Item Status LIVE XSP Chainage Display Address
 Chainage 0.00 Grid Ref. 278010.72 382426.07
 Exp.Code Tag No. 0214 Plan No.
 Description PAVEMENT next to road. Some hollowness evident in stem but limited

Attribute Title	Attribute Value
Photograph	DEMO_Q\2020_11\000324870_ATT_0020.jpg
Tree Type	Acacia
Ownership	ERF Land - Openspaces
MIS Verified	
Diameter at breast height	
Percent tree cover	
Percent measured	
Botanical Name	
Ash Dieback	<input type="checkbox"/>
Degree of Dieback	
Number of Trees	
Height of Trees	
MIS Action Taken	
Managing Services action Rec	
Managing Service Action taker	



AA001 HIGH

Pretty Good Asset Inventory?

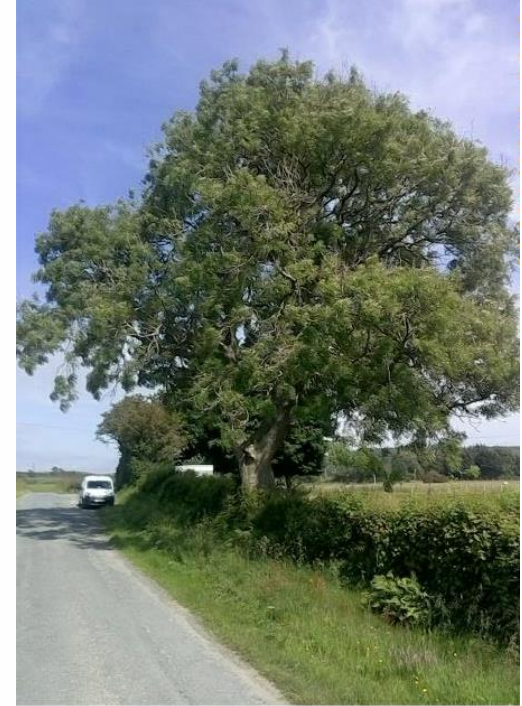


- Highway Network
- Adopted Highway Layer
- Started digital **urban street** tree data collection in 2014



Problem...

- Ash - more prevalent on
 - highway verges
 - woodland
 - in informal self-seeded growths
- Left clueless...
 - How many ash trees in the County?
 - Where are they?
 - What degree of risk?



Next Steps

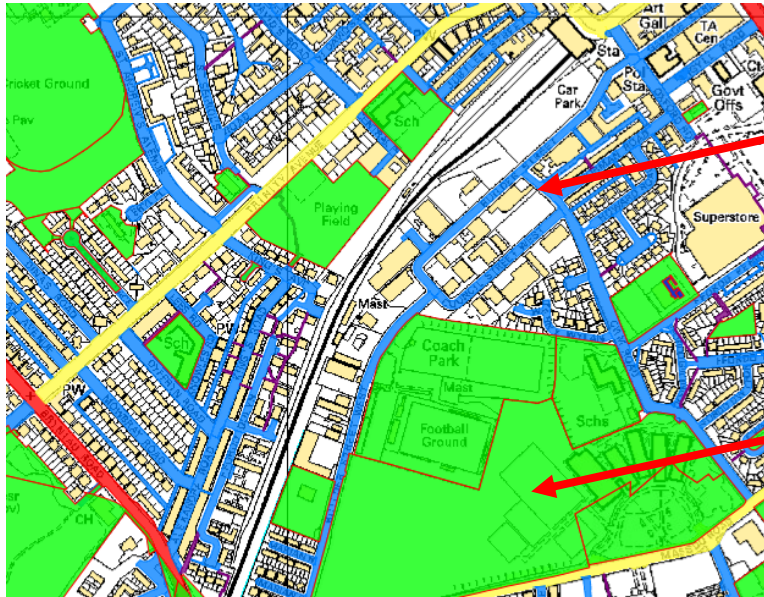


- Our “Trusty” Tablets
- Traditional Data Collection Methods



Scale - Too big

- 1669km Highway Network
- >11 million m2 of CCBC Land
- >17 million m2 of adopted highways

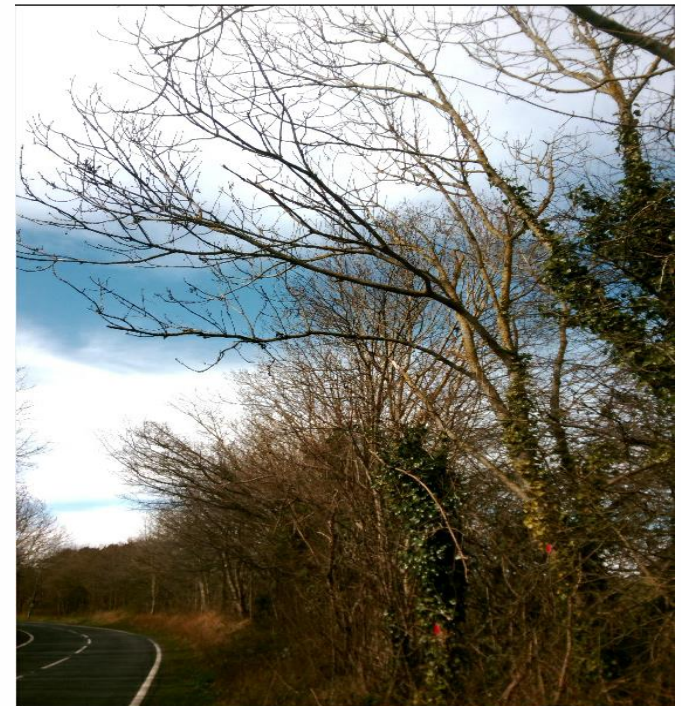


Adopted
Highways

CCBC
Freehold
Land

Timescales - Worrying

High risk of falling onto public areas -
highways/ parks/ playgrounds/ schools



Mott's Survey Technology

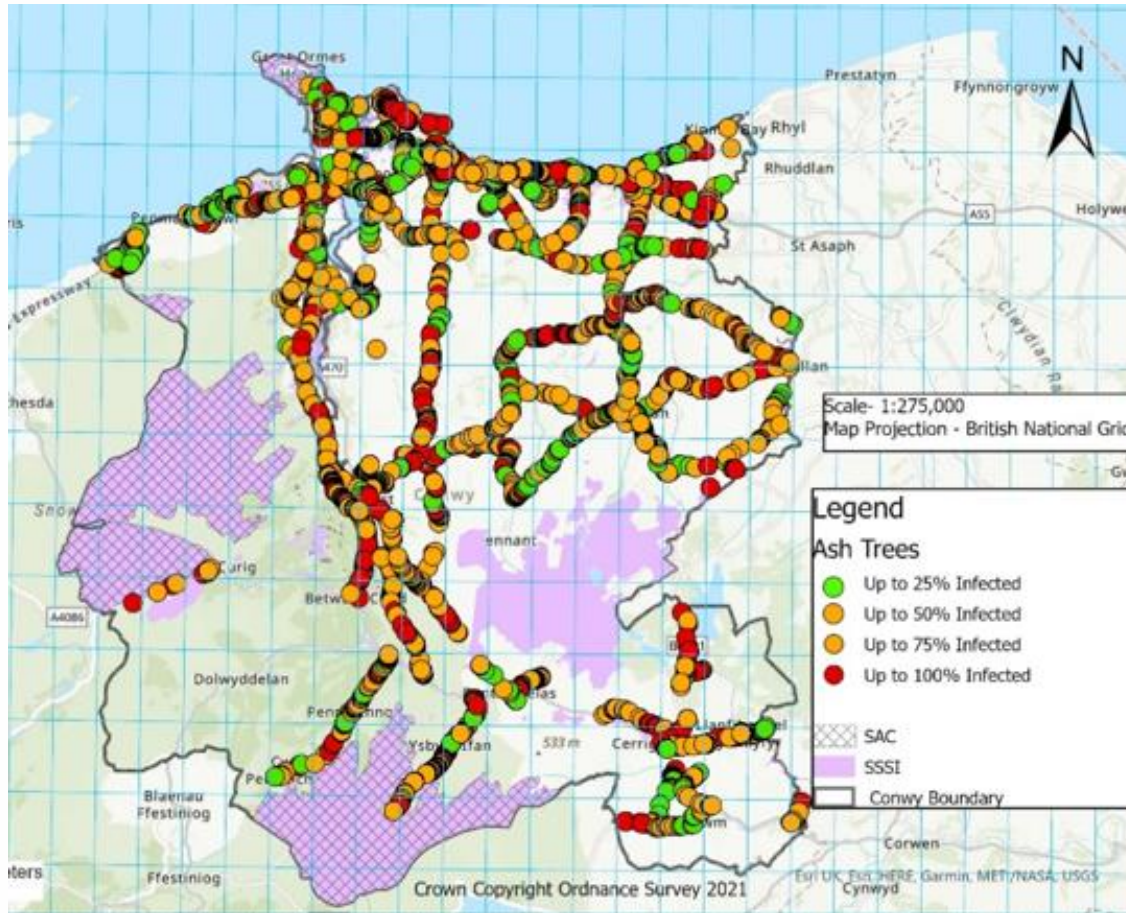


Network Hierarchy	Length Surveyed (km)	Overall Highway Network	Overall Survey Coverage %
CHSR	0	4	0%
CH1	41	41	100%
CH2	100	100	100%
CH3	192	192	100%
CH4	153	153	100%

In just 1 season – 30% Highway Network Surveyed



Results – Spatial Survey Analysis



ADB Located CH1-
CH4 Network



Scale of ADB



Degree of ADB



Tree Height



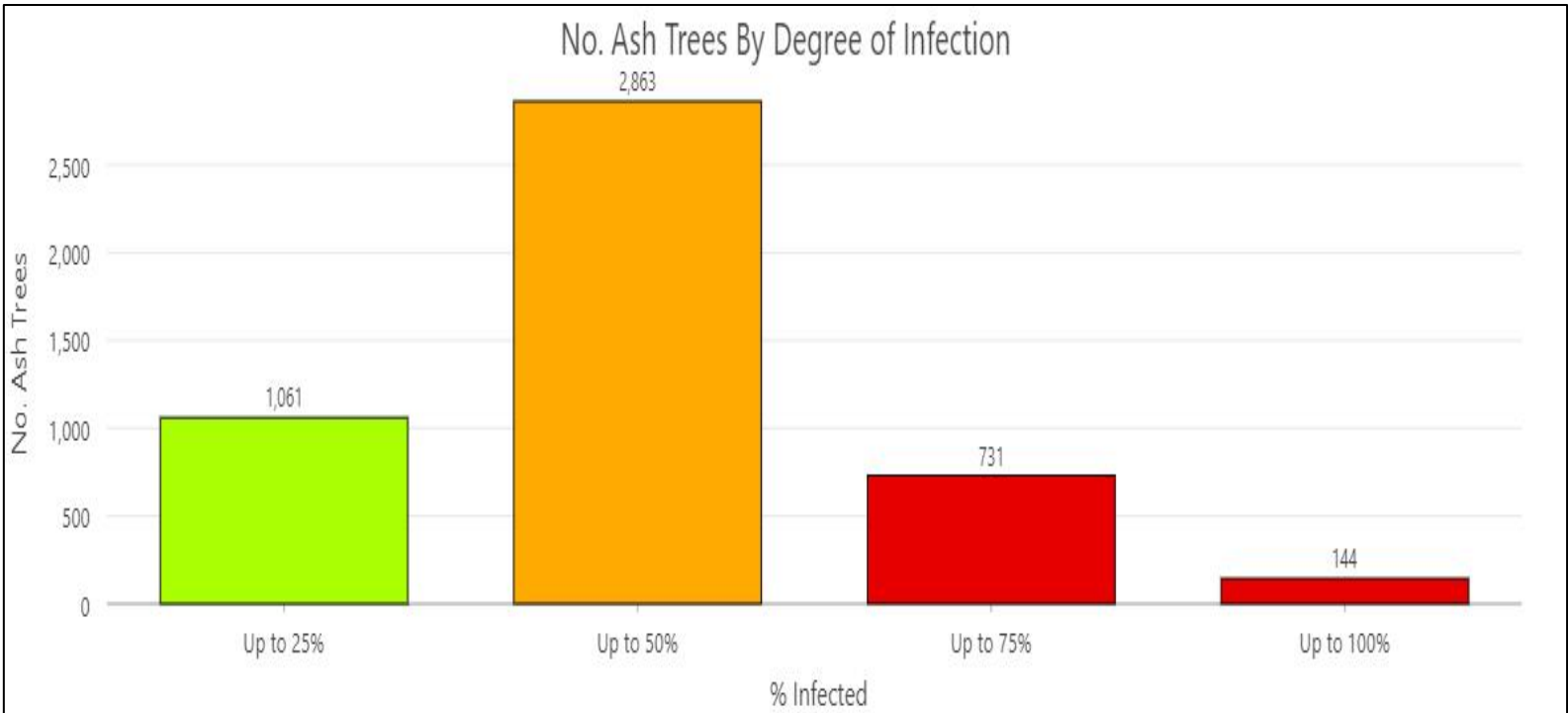
Photographic
evidence

Overlaid with
environmental data

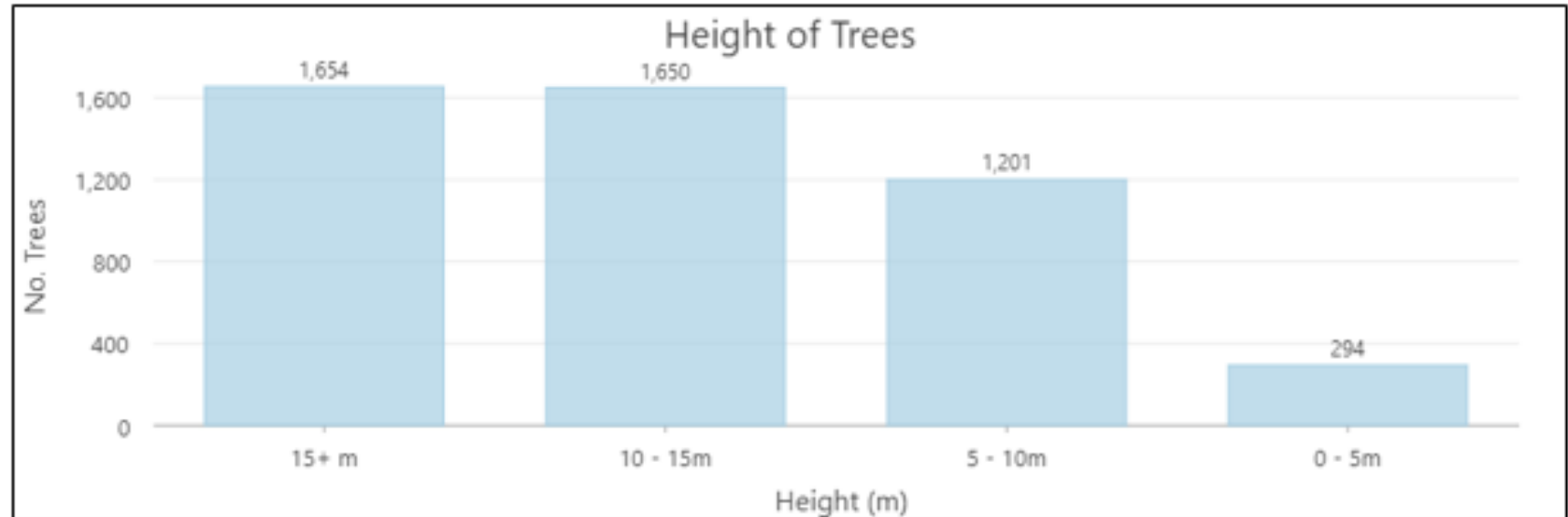
- SSSI
- SAC

CCBC Data Analysis

- Interrogate data
- Identify trees by condition
- Target prioritisation based on risk



Data Analysis



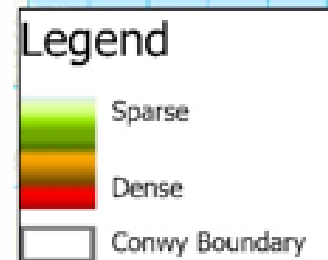
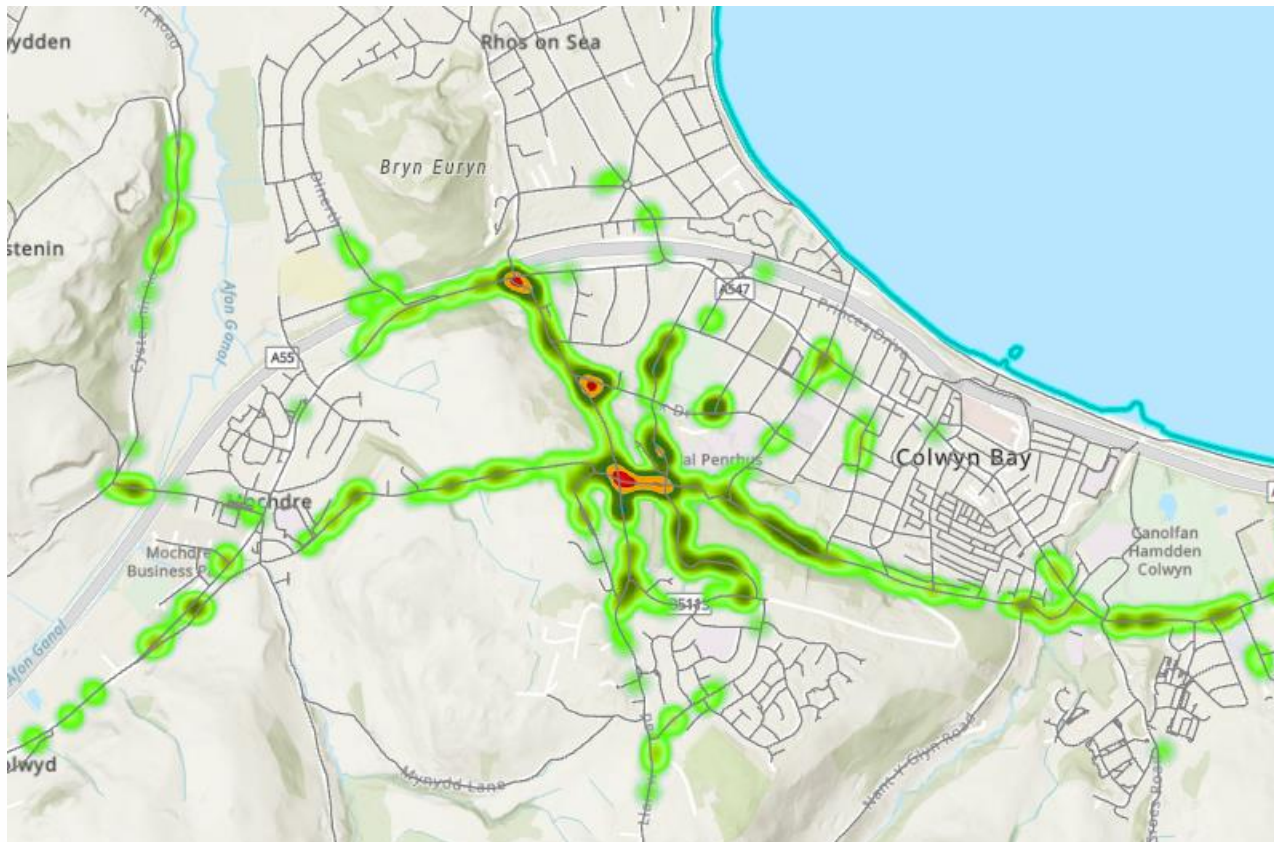
- Survey data picked up height of trees
- Allowing us to understand technical requirements to deal with trees

Cost – Actual Cost Forecast

Height of Trees	Average Daily Cost	Average No. Trees Removed Day Rate	Average Cost per Tree (£)	Degree of Dieback				Total Costs Raw Survey Inventory (£)
				Up to 25%	Up to 50%	Up to 75%	Up to 100%	
0-5m	1960	35	56	69	165	40	20	£ 16,464.00
5-10m	1960	27	72.59259	300	672	180	49	£ 87,183.70
10-15m	2503	8	312.875	367	987	244	52	£ 516,243.75
15m+	2503	4	625.75	325	1039	267	23	£ 1,034,990.50
Total No. Trees				1061	2863	731	144	
Total Cost				£ 343,835.65	£ 1,016,984.10	£ 258,723.42	£35,338.79	£ 1,654,881.95

- Condition & Height data enabled us to calculate short, medium and long term risks and costs associated with managing ADB

Prioritisation - Risk Based Approach – Tree Density

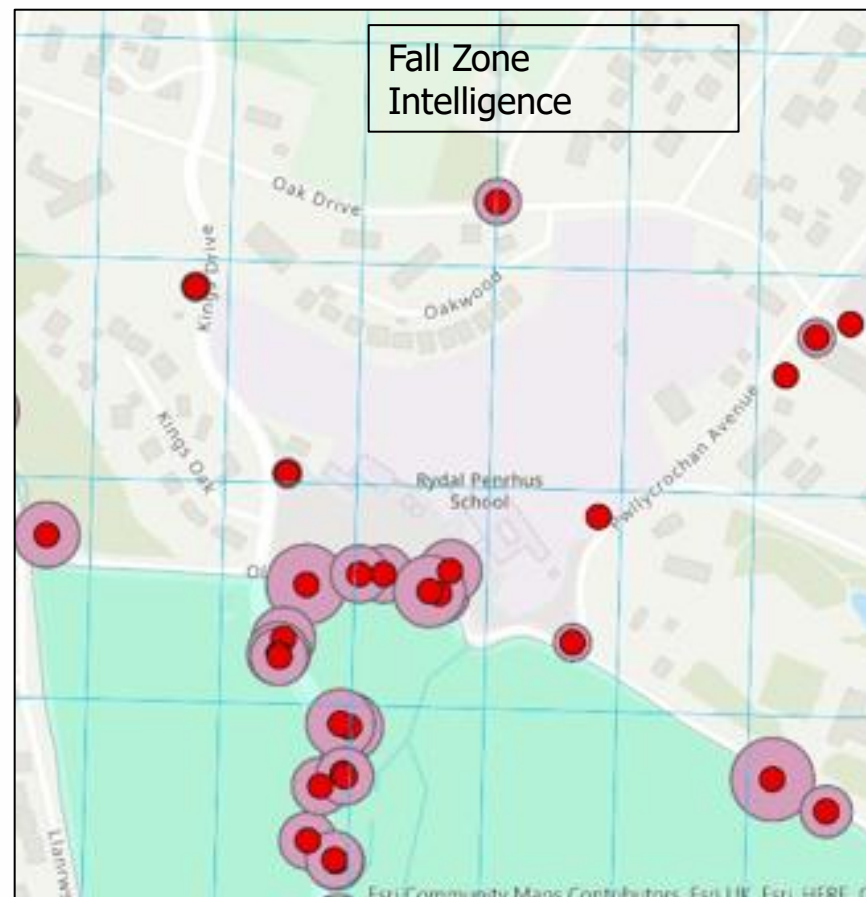


Prioritisation
Intelligence

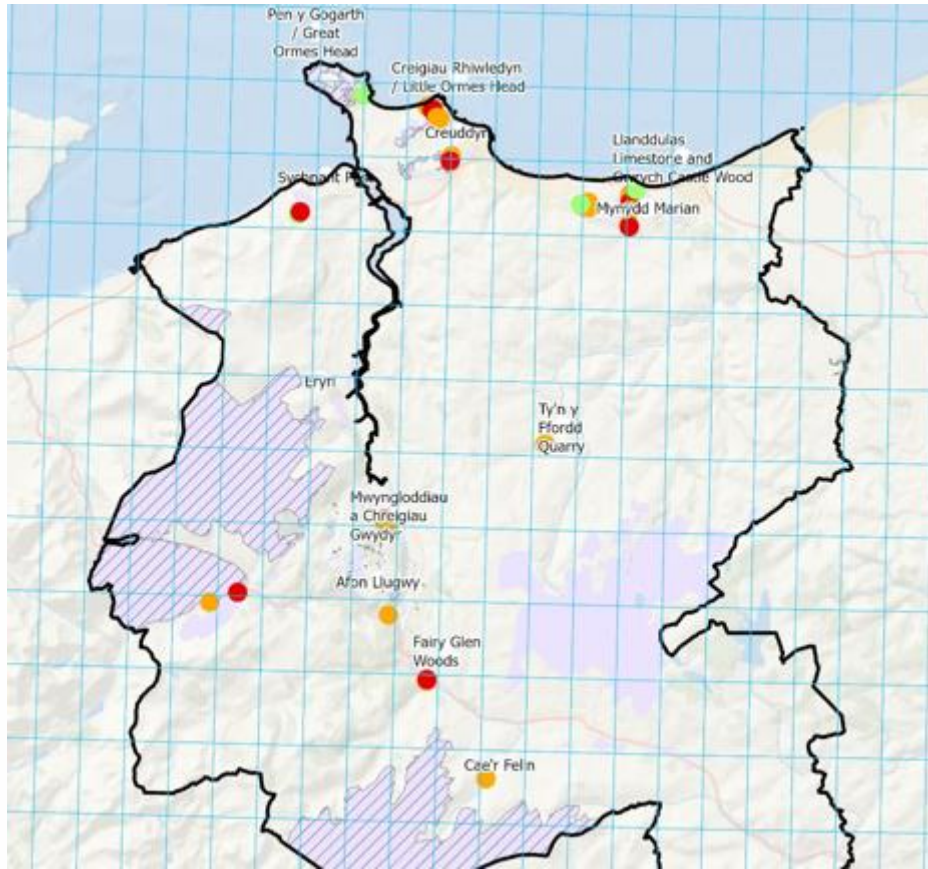
Prioritisation - Risk Based Approach – Fall Zones

Identify Network Sections with greatest volume of dangerous trees

Network Section	No. Trees Up to and >75% ADB
B5106/99647	48
B5113/01766	33
B5113/99646/10	28
B5106/06421	19
A548/06419/20	15
B5113/99646/30	14
B4407/06420/30	12
A543/06477/20	11
A547/02258/35	11
B5113/06428	11
C/05403/10	11
C/05490	11
U/01803/20	11



Prioritisation - Early Mitigation – Trees SSSI/SAC



Quantity by Degree ADB

Degree of Dieback	No. Trees within SSSI Area	No. Trees within SAC Area
Up to 25%	17	8
Up to 50%	41	9
Up to 75%	13	3
Up to 100%	2	0
Total	73	20

Quantity by Location

Special Designation Location	Quantity of Trees with ADB
Afon Llugwy	1
Cae'r Felin	1
Creigiau Rhiwledyn / Little Ormes Head	5
Creuddyn	15
Creuddyn Peninsula Woods	7
Eryri	2
Fairy Glen Woods	6
Gwydir Forest Mines	6
Llanddulas Limestone and Gwrych Castle Wood	11
Mwyngloddiau a Chreigiau Gwydyr	6
Mynydd Marian	14
Pen y Gogarth / Great Ormes Head	14
Sychnant Pass	3
Tyn y Ffordd Quarry	2
Total No. Trees	93



Checking for bats

Operational Impacts

- Operational phase started before the strategic planning completed
- 68.7km of highway network treated
- 554 areas of high risk trees removed
- Quantified condition data provided by the inspection technology enabled targeted resources at the highest risk areas
- In parallel, early identification of trees in their infancy of the disease, in SSSI/SAC
 - better intervention = adoption of compensatory mitigation measures
 - reduce potential future impacts against biodiversity and ecosystems



Asset Management System

Insight Enterprise - Asset Register - Item Details

File Reports Shortcuts Tools Go to Help

Exit Desktop Map Options Functions Previous Next Create Amend Confirm Cancel

Summary Details Attributes Updates Links Contacts Co-ordinates Activities Survey Index Groups Objects

Address ABERGELE ROAD COLWYN BAY CCBC A547/01653

Location


Unit Type TREE Unit No. 585687 Item Status LIVE XSP Chainage Display Address

Chainage 0.00 Grid Ref. 285944.00 378253.00

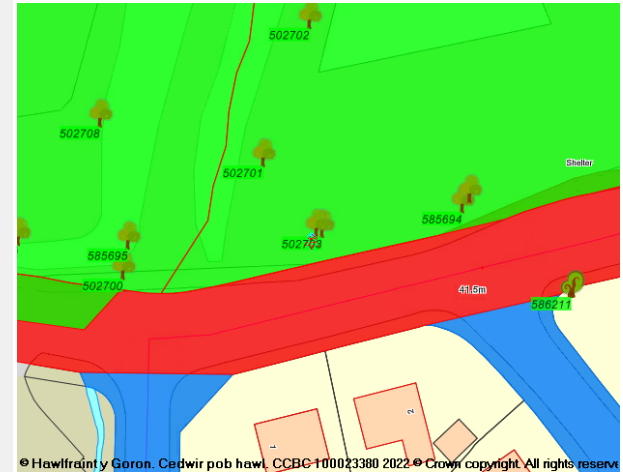
Exp.Code Tag No. Plan No.

Description

Attribute Title	Attribute Value
REQUIRES NRW	
Re Inspection Frequency	
External Survey ID	2324.00
Asset Source	Mott MacDonald Survey
Fall Area	233.00
Photograph	K:\Symology\CCBC\Assets\Trees\Tree Assets
Tree Type	Ash
Ownership	CCBC
MIS Verified	Yes
Diameter at breast height	
Percent tree cover	
Percent measured	
Botanical Name	
Ash Dieback	<input checked="" type="checkbox"/>
Degree of Dieback	Up to 75%



AA001 HIGHWAYS LIVE 18/03/22



Data loaded into existing Asset Management System

Asset Based Works Orders

Insight Enterprise - General Maintenance - L.A.Code Details

File Reports Shortcuts Tools Go to Help

Exit Desktop Map Options Functions Previous Next Create Amend Confirm Cancel

Summary Details Schedules Comparison Extras History Invoices Expenditure Co-ords Locations Groups Activities Fields Objects

L.A.Code 00231231 Stage RECORDED Source BULK UPD Class 1
 T/S P/S LR
 Originated 14/02/2022 (blank=now)
 Address ABERGELE ROAD Unit Type TREE E/D S/R Oth Designations
 COLWYN BAY Unit No. 585687 Permit?
 Section A547/01653 Network CCBC Chainage Display Address Index Groups
 Location Chainage XSP Grid Ref. 285944.00 378253.00

Details
 Contract Id TREE/ Defect TW02 Tree Ash Die Back SWR Link?
 Exp. Code WOC212TW02 Year 21 Priority 2 1 Month Charge Method DC
 Client Ref. Duration 1 Planned Start 21/02/2022 Planned Finish 21/02/2022
 Description Urgent works - Ash Dieback

Action
 Action Type DEF Default Action Expected Claim Value Result
 Action Text Potential Warranty?

Last updated by CHARLEY at 15:25 on 18/02/2022

AA001 HIGHWAYS LIVE 18/03

Easily raise works against individual or groups of tree assets

Order No. 0 WORKS ORDER TICKET - PRE - ORDER PRINT

L.A.Code 231231

Client Ref Link/Section: A547/01653 XSP Chainage: 0.00

1 Month Contractor Client TREE / TREE

Date of Issue 14/2/22 0:00 Completion Due Total Cost

Exp. Code WOC212TW02 Inspector: Charlie Howes

Defect TW02 Tree Ash Die Back


Description of work required Urgent works - Ash Dieback

Location of Defect: - ABERGELE ROAD, COLWYN BAY

Grid Reference 285944/378253.00 Road Class 1

SITE SPECIFIC CHECKLIST		Y/N
1	Safe Access?	
2	Weather suitable for work?	
3	Visibility good?	
4	Lighting good?	
5	Correct TM placed?	
6	Overhead Lines?	
7	Drains/Services?	
8	Stats plans/CAT Scan?	
9	Good ground conditions?	
10	Other works nearby?	
11	Tools in good order?	
12	Plant & Equipment in good order?	
13	Properly Trained People?	
14	Correct PPE?	

COMMENTS



Streetworks Notification

Works Ref.	AA013-S000000009989	CCBC OPEN SPACES EAST
L.A.Ref	00247264	Works Status PROPOSED WORKS <input type="checkbox"/> Permit Scheme <input type="checkbox"/> T/S <input type="checkbox"/> P/S <input type="checkbox"/> L/R
Address	ABERGELE ROAD COLWYN BAY, CONWY	<input type="checkbox"/> E/D <input type="checkbox"/> S/R <input type="checkbox"/> Oth C/W CARRIAGEWAY TYPE 2 - 2.5 TO 10 MS F/W OTHER FOOTWAYS
NSG Ref.	466/01653	
Description	Urgent works - Ash Dieback	
Location	LOCATION UNKNOWN	Post Code

Works Stage Dates	Latest Promoter Notice	<input type="checkbox"/> Held	Latest Authority Notice
Interim Due 21/02/2022	Notice Type THREE DAY	Notice Type	
Interim Complete	Works Type MINOR	Duration Est.	
Permanent Due	Works Start 21/02/2022	Works Start	
Permanent Complete	End 21/02/2022	End	
Remedial Complete	Originated 18/02/2022 15:28	Originated	
Warranty End	Issued 18/02/2022 15:28	Issued	
Works Abandoned	Notice Text	Notice Text	

Works Restricted? [View Text](#) [View Text](#)

Project Ref. Co-ordination Locations?

Description

Last Inspection Type	Date	Result	<input type="checkbox"/> Attachments
Next Inspection Type	Date		Traffic Signals
Last Comment OD	Date	Type	
Description			

Works created from General Maintenance, changes may introduce inconsistencies

AA001

HIGHWAYS LIVE

18/03/22




Ensure SW notices
in place during
works

Private Land

Address	NANT ISAF TO BRYN RHUG	CAPEL GARMON	Section	CCBC	U/05863/10
Location					
Unit Type	TREE	Unit No. 584246	Item Status	LIVE	XSP Chainage Display <input type="text" value="Address"/>
Chainage	0.00				Grid Ref. 282099.99 357153.13
Exp.Code		Tag No.			Plan No.
Description					

Attribute Title	Attribute Value
REQUIRES NRW	
Re Inspection Frequency	
External Survey ID	
Asset Source	
Fall Area	
Photograph	K:\Symology\CCBC\ADB\2021\43325\IMG_202
Tree Type	Ash
Ownership	Private
MIS Verified	Yes
Diameter at breast height	
Percent tree cover	
Percent measured	
Botanical Name	
Ash Dieback	<input checked="" type="checkbox"/>
Degree of Dieback	



AA001	HIGHWAYS LIVE	18/03/22
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Started to serve notices for Ash on private land

Assets linked to Land Registry Records

Insight Enterprise - Asset Register - Item Details

File Reports Shortcuts Tools Go to Help

Exit Desktop Map Options Functions Next Create Amend Confirm Cancel

Summary | Details | Attributes | Updates | **Links** | Contacts | Co-ordinates | Activities | Survey | Index Groups | Objects

Address	NANT ISAF TO BRYN RHUG	CAPEL GARMON	Unit Type	LAND QUERY	Unit No.	686	
Location	CYM767840				<input type="checkbox"/> Shared?		
Item Status	LIVE	UPRN			202102201	357149.63	
Exp.Code		Userfield1		Query No.			
Description							

Attribute Title	Attribute Value
Query Status	Complete
Date Identified	13/01/2022
Query Source	Open Spaces - ADB Project
Date Title Investigated	13/01/2022
Digital Terrier	
Maintenance Records	
Investigation Required	
Investigation Type	
Investigation Comments	
Outcome	Private Land Registered
Photographic Evidence 1	K:\Symology\Objects\Land Investigations\0586
Photographic Evidence 2	
HMLR Title Number	CYM767840
Land Registry Title Plan	K:\Symology\Objects\Land Investigations\0586
Land Registry Title Plan 2	
Title Deed	K:\Symology\Objects\Land Investigations\0586

AA001 | HIGHWAYS LIVE | 18/03/22

Issuing Informal & Formal Highways Act Notices

Licence No.	00043325	Stage	COMMENCED	Licence Type	AD3	Ash Dieback 3 Month Notice		
Charge Code	00043318	External Ref.				<input type="checkbox"/> T/S	<input type="checkbox"/> P/S	<input type="checkbox"/> L/R
Address	NANT ISAF TO BRYN RHUG	Unit Type	LAND QUERY	Permit Scheme	<input type="checkbox"/>	<input type="checkbox"/> E/D	<input type="checkbox"/> S/R	<input checked="" type="checkbox"/> Oth
Location	CAPEL GARMON	Unit No.	686					
	CYM767840							Grid Ref. 281718.00 357624.00



Adran Yr Amgylchedd, Ffyrdd a Chylfeusterau
Environment, Roads & Facilities Department

Pennfaeth Gwasanaeth
 Head of Service - Geraint Edwards, BE(Engl/Hors) CEng FICE

Cyfeiriad Post / Postal Address: P.O. Box 1, Conwy, LL30 9GN

01492 57-5337
01492 57-5199
enfrsa@conwy.gov.uk

Ein Cyf / Our Ref: 43325
 Eich Cyf / Your Ref:
 Dyddiad / Date: 13/01/2022

Dear Sirs,

ASH DIEBACK DISEASE - CYM [REDACTED]

We recently identified an overhanging ash tree(s) from your property which is exhibiting severe symptoms of ash dieback disease (*Hymenoscypha fraxineus*) and which therefore endangers the passage of vehicles / pedestrians. The location of the ash tree(s) is shown on the enclosed plan.

The law says that landowners are responsible for trees and vegetation growing on their property. Owners have a duty to ensure that they do not obstruct or endanger roads and footpaths. Please arrange to address the danger presented by this tree(s) within 3 calendar months of the date of this letter (this will normally involve felling the tree). Failure to address the danger will result in the issue of a formal Notice requiring compliance within 14 days. In the event of non-compliance we will undertake the works ourselves and recover costs from you.

When you do the work, please make sure that you immediately remove cuttings which fall onto the road, roadside ditches or footpaths. You can find more advice and guidance on our website, including information about nesting birds and small mammals:
<https://www.conwy.gov.uk/en/ResidentPlanning-Building-Control-and-Conservation/Trees-and-High-Hedges/Trees-and-Hedges-General-information.aspx> (or search "Trees and Hedges" from the website's homepage).

Please act on this request to avoid the need for us to take any formal action.

Yours faithfully,

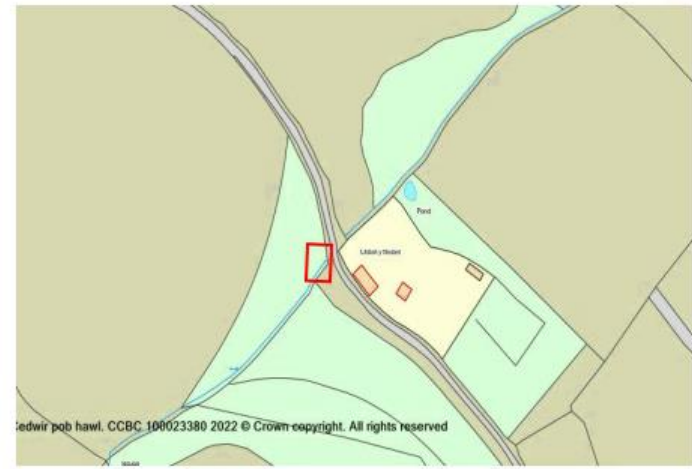


for G.B. Edwards
Head of Environment, Roads & Facilities

Rydym yn croesawu gohebiaeth yn Gymraeg. Byddwn yn ymateb i unrhyw ohebiaeth yn Gymraeg ac ni fydd hyn yn arwain at unrhyw oedi.
 We welcome correspondence in Welsh. We will respond to any correspondence in Welsh which will not lead to a delay.

LOCATION PLAN

Area of trees requiring your investigation.



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Summary

Been a journey...

Motts Survey Data

- Speed
- Cost savings in inspection costs (TM)
- Great indicator - Authority focus

CCBC Analysis

- Accelerated action & adopted risk based approach
- Tree density maps
- Fall zones

Majority of dangerous trees from CH1-CH4 survey results in high risk category have already been completed or are programmed for completion in coming weeks.





Future Development

Mott MacDonald

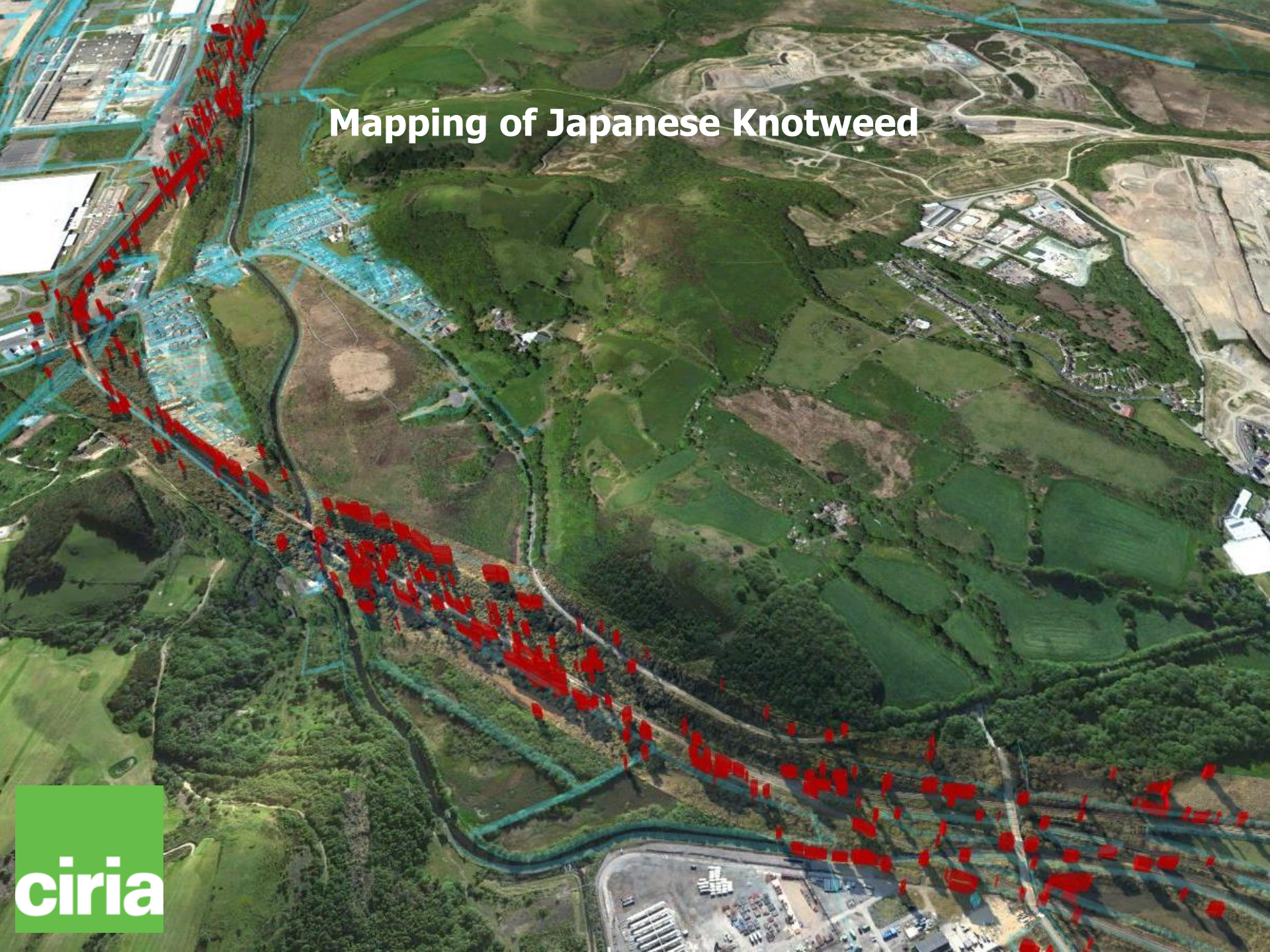
IDA@mottmac.com



UAV Capability – Ash, Invasives and Structural Inspections



Mapping of Japanese Knotweed





Automating detections of bats using cameras

Pavement Health



A12

A12

What value can we extract from existing data?



High Risk Trees

Invasive Species

Payement Defects

Barrier collision

Bridge Strike

Drainage Performance

Road Markings

Debris



Thank you

Any questions?

Get in touch:

IDA@mottmac.com

