Friends of Gillfield Wood
Final Report on
Hedgerow & Significant Tree Recording
With relevance to Ghost wood

friendsofgillfieldwood.com

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Appendix

Introduction

In 2012/13 the Friends of Gillfield Wood (FoGW) undertook a Level 1 Heritage Lottery project, 'Our Stories'. The survey recorded all trees and stumps >1m in trunk diameter. Following Quantum Graphical Information System (QGIS) training from Barry Wright and Chris Percy of South Yorkshire Biodiversity Research Group (SYBRG) we were able to use our tree/stump data to map the distribution and density of the current wooded area. (See Map 1 page 32)

Such mapping techniques will be used in conjunction with other factors, i.e. Significant Tree (ST) distribution outside the current wooded area, Ancient Woodland Indicator (AWI) plant distribution, historic field names, archive material, and fungi surveys. This helps determine the extent of the wood alluded to in the Domesday reference of 1-mile in length by ½ mile breadth. We refer to this now diminished wooded area as the 'Ghost Wood'.

(Domesday Book 1086). - *In Totingle, Tolf had IV bovates of land hidable, land for one plough. It is waste.* ***Wood pasturable, 1 mile in length and half a mile in breadth.*** *TRE val X shillings, now XII pence.*

From the above extract, it is notable that although the wood is still approximately 1 mile long it is not much wider (north to south) than a hundred yards. The main aim of the project is to try and identify the extent of the lost woodland (Ghost Wood).

There are 4 areas of consideration we are following:

1. *Ancient field names* that were wood related (see Map 6 page 34) cross referenced to 2- 4 below.
2. *Hedgerow, shrubs and plants* that are Ancient Woodland Indicators outside of the current wood.
3. *Significant woodland trees* no longer inside the current woodland boundaries. (Mapping see 2 above)
4. *Archive information*; maps, a student's thesis, historic media, deeds, wills, court roles etc.

Hedgerows

One determinant of the extent of the Ghost Wood is the hedgerows. From our HLF1 workshops, additional instruction from SYBRG and our own research, we are fully aware that certain shrubs forming the hedgerows and the associated ground flora could be key indicators to previous wooded areas.

Following two visits focusing on hedgerow recording, the FoGW field group devised a recording system based on that of Dr Barry Wright. Surveyed hedgerows are shown on Map 2 Page 34. Our system comprises 2 record sheets for each 4-metre section. Within each section, flora with indicator species 'potential', along with dominant woody shrubs, are recorded.

Additionally, the sheets record:

- Sections through the hedgerow
- Height deviation in each 4m section
- Significant trees >300mm trunk diameter
- Way Points recording specific features and Significant Trees

Photographic records of specific features and Significant Trees (STs) were recorded with GPS waypoints and cross referenced to a 'tick' sheet for other data. To date this library of photographs numbers around 600 images.

All the hedgerows recorded were given a unique reference based on the 1835 Edition 1 OS map's field reference number. So, a hedgerow measured from field 301 is designated HR-301-1. Associated photographs are designated with the same reference as the hedgerow, plus a frame reference e.g. HR-301-1-001.

Geo-referenced maps of the wood and its surrounding fields were produced to enable us to display data from the survey. QGIS was used as the geographical information system. Initial plots of the data as coloured circles along each hedgerow soon made it clear that, on an individual species plot, numerous map charts would have to be required. These would not be easy to compare. Instead an MS Excel template was constructed with top rows showing Significant Trees, hedgerows, gaps and stone walling. Following these, rows of woody plants such as Hawthorne were presented using conditional formatting – the more abundant the species the darker the cell. Finally, rows were allotted to ground flora in terms of their presence(x) or absence(blank). It was decided that the hedgerow data would need to be recompiled into larger data sets to enable us to show the distribution of species

across **all** hedgerows on the map. Different data set layers, i.e. different species, could then be overlaid in QGIS to build up the species' distribution. This work is still to be done but will give us a better understanding of the likelihood of an extended ancient wood where today there are now only fields.

Returning to the hedgerow recording sheets. Each would:

a. Identify the hedgerow using the FoGW referencing system.
b. Identify and display horizontally the number of 4m transects.
c. Identify and display all recorded species and physical attributes vertically. (e.g. dry-stone walls, gaps, STs, shrubs and flora)
d. Display a hedgerow 'summer silhouette' graphically at the base of the sheet.

The spreadsheets also show two statistics for the species recorded. The woody shrubs are allocated a relative density as a percentage of the total species present. An individual species density is allocated a value from 1 to 6 where 1 represents an individual occurrence and 6 is only used for complete domination by a species in a 4m section. Woody shrubs generally, because of their size, start at 2. A species' percentage figure is obtained by taking the row total and dividing by the total for the entire woody shrub section.

The scoring system of values from 1 to 6 is based on Dr Barry Wright's adaption of the DAFOR system using spider diagrams. In order to achieve the results on spreadsheet we had to convert these to a number system. Dr Wright also gave us a set of Ancient Woodland Indicator Species scores for use with ground flora. We cross-referenced this with species list from the Woodland Trust. FoGW AWI ratings are shown in red, Dr Wright's ratings in black on page 30.

The ground flora is noted on the hedgerow spreadsheets simply as present(x) or absent. The second statistic was obtained by taking the species' row count and multiplying by the species AWI to produce a score for each species. These were summed for all species. In order to produce a more comparative figure for each hedgerow this total was divided by the overall hedge length (4 metres x number of sections in hedgerow).

Please note that these spreadsheets are a system under development. It became clear from internet searches and research papers that there is considerable discourse on the rating systems for AWIs across the UK. Therefore, we are aware our system is solely for FoGW use and it does not presently claim scientific validity. We believe, however, that it does help us to determine how likely it is that the hedgerow was once part of the wood.

To date we have recorded around 2.7Km of hedgerows with around 130 Significant Trees.

An understanding of losses and gains in hedgerows over time are shown on Maps 3 and 4 page 35 in the Appendix. Map 3 compares the1835 OS Edition1 with the 1898 OS Edition 2. Map 4 compares the 1898 map to the current Google earth view.

Ghost Wood & Significant Trees– In addition to recording trees in the hedgerows the FoGW field team decided at the outset to extend the scope by recording Significant Trees in more detail. These are defined as trees with a trunk diameter >=300mm at a height of around 1.6m.

The data recorded includes tree location (GPS), species (or at least genus) with its common name, and the following conditions of the tree: was it a maiden, pollard or coppice (+ trunk count), was it diseased, was there evidence of bat or bird nests. The physical properties of the tree comprised height, spread, girth, standing or fallen, and dead or alive.

Additionally, a summer 'silhouette' of each tree was photographed and added to the record sheet. We intend to add a Winter silhouette later. Once recorded and cross referenced to either a hedgerow, field or ghost hedgerow the trees are plotted on a QGIS control map (see Map 5 page 36).

The STs are also shown as a 'lollypop' symbol on the hedgerow silhouette at the bottom of each Excel hedgerow recording sheet.

The HLF brief states that we would be recording trees on both the North and South Banks of the brook. The group have permissions to survey the trees and hedgerows on the North side of the wood (Sheffield City Council and private land). Due to land ownership considerations, we have been unable to proceed with the fields on the south side (Derbyshire). It should be noted the Derbyshire side does contain significantly more hedgerows and trees and is known historically not to have been heavily affected by agriculture. A decision on whether any hedgerow/ ST recording takes place on the south side will be taken in due course.

Early work from Waxcap Surveys

Chris Measures (FoGW), who has a particular interest in fungi, pointed out the prevalence during the autumn of waxcap fungi (genus *Hygrocybe*) in a group of fields to the south side of the wood. In November 2016 we were assisted by SYBRG with training in order to identify this group of fungi with the intention of recording the species and their locations using GPS.

The waxcaps are significant as they are strongly associated with unimproved grasslands. It has been suggested that *Hygrocybe* species originally evolved in grassy woodland glades and that historic deforestation and agriculture has in effect expanded the habitat of these fungi. We were informed by SYBRG that these fungi suggest an extended area of woodland historically.

This work was initially carried out last autumn and surveying was resumed this August through to the end of September. During these two surveys we have identified or had assistance in identifying 24 species from 198 records. (See map 6 on page 37). We were surprised to find out that a good 'catch' would have been 14 different species. This makes the pasture rather special.

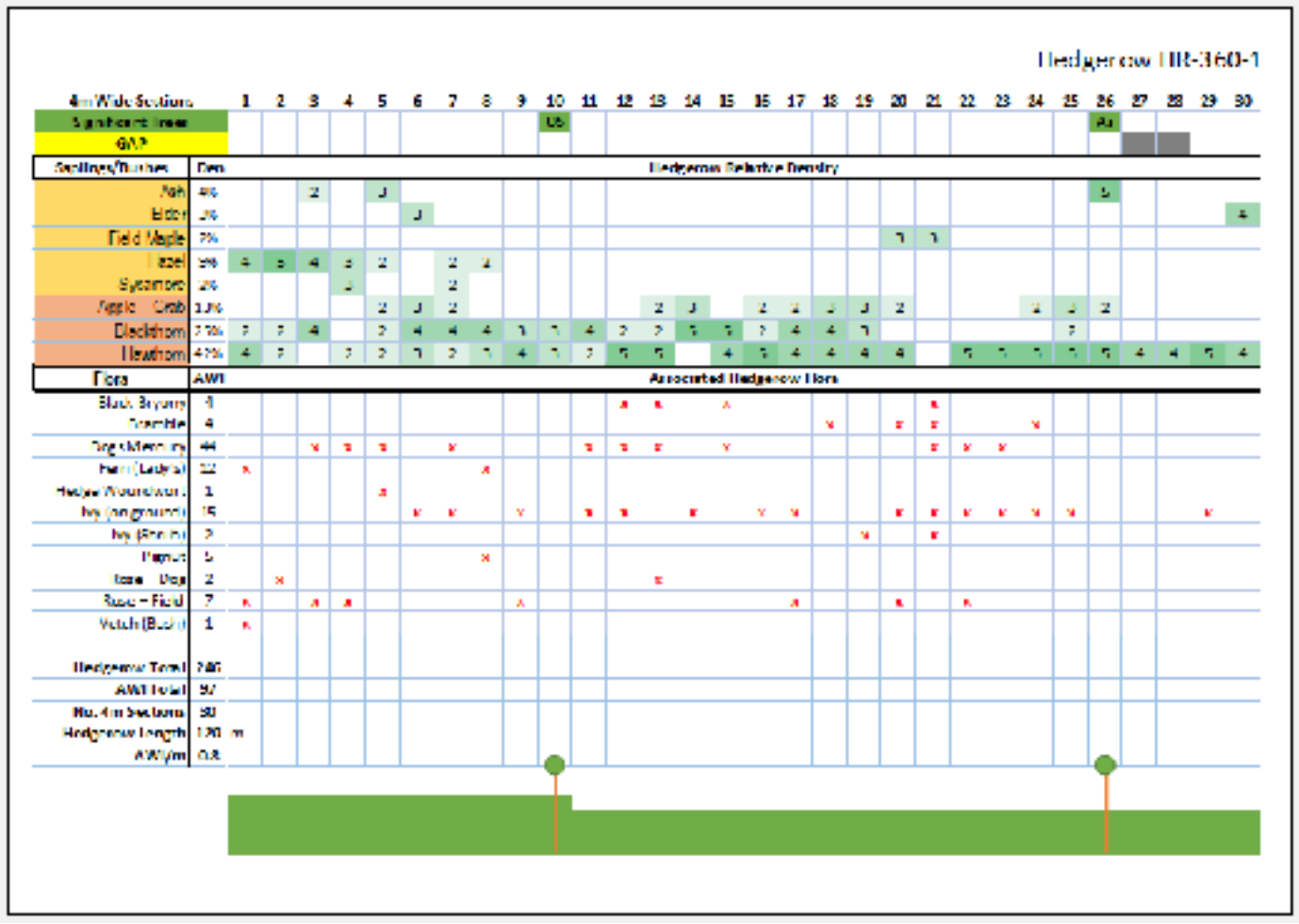
Further work is need to analyse the data and consider the significance of these finds.

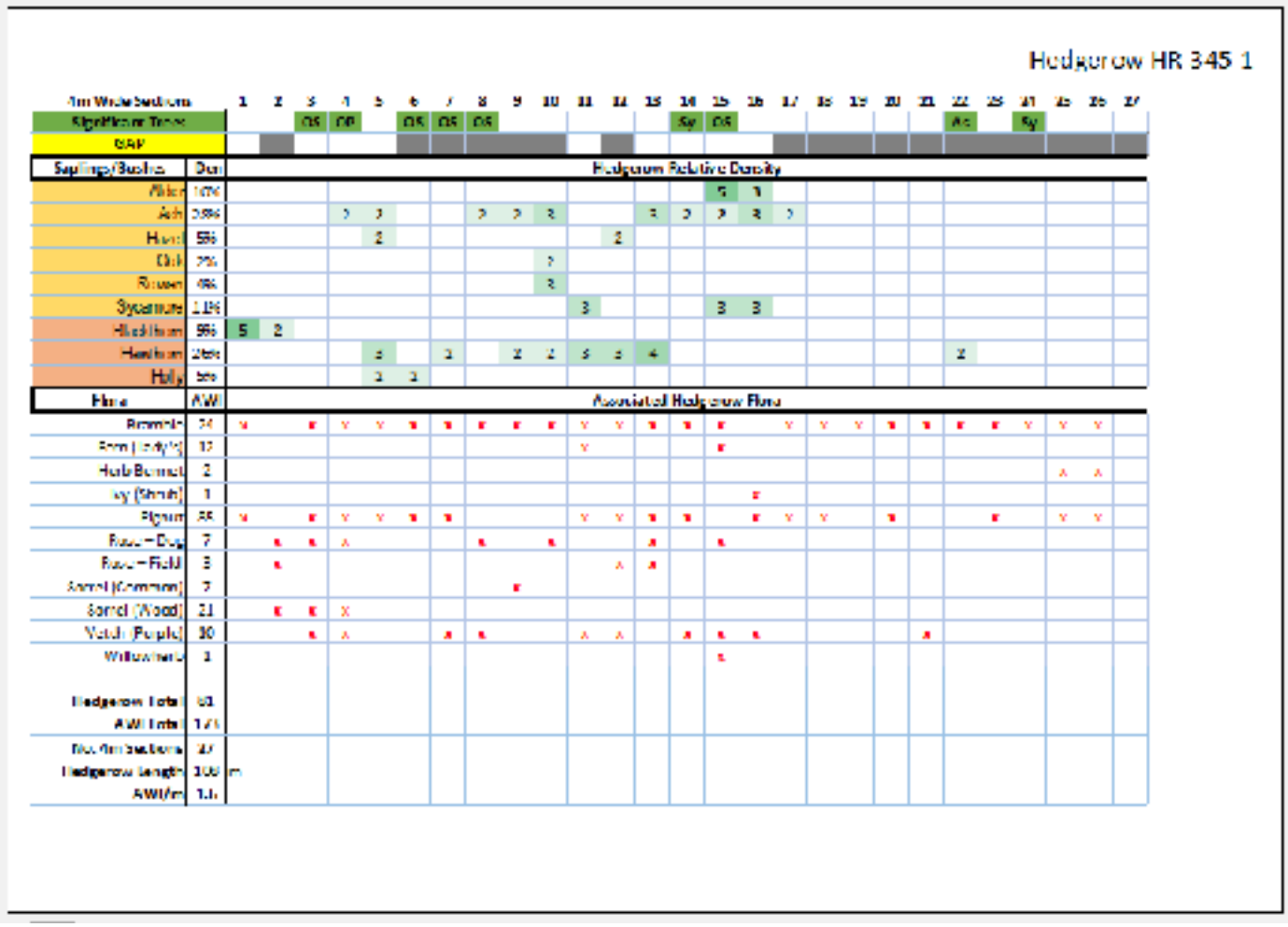
Woodland Archive Research

The FoGW archive group researched maps, surveys, wills, deeds, court records, historical newspapers and legal documents, to determine land ownership, transfer and usage. As part of their research they identified ancient field names. Some of these names imply they were once woodland or areas of woodland clearance, on both the North and South side of the brook. This information is currently being finalised and documented to be cross referenced with all of the other FoGW research to try and determine the extent of the Ghost Wood. A preliminary map produced by Josie Dunsmore of the ancient field names is shown on Map 7 on page 38.

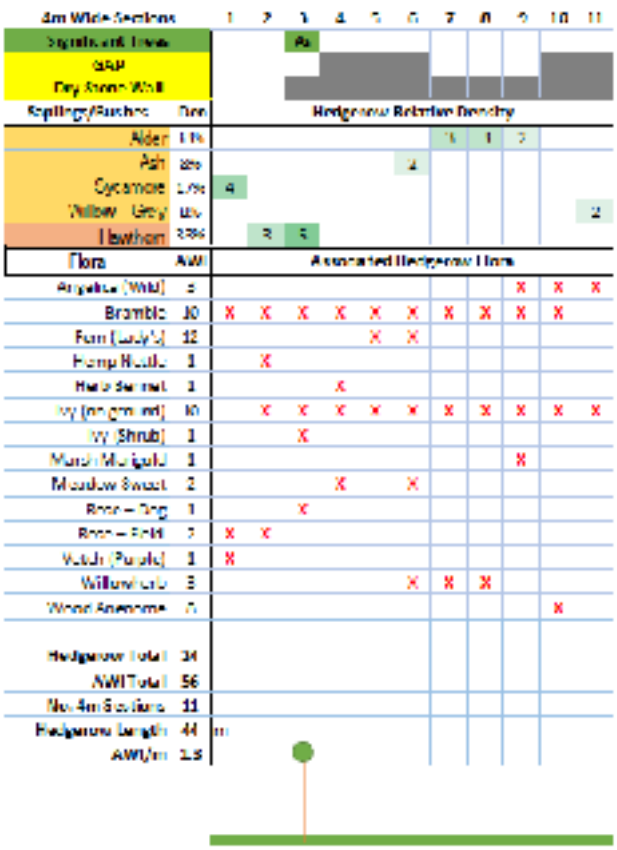
The archivist team are still finding out new information and we envisage (after the completion of our involvement in HLF2) that several sub-projects will develop for FoGW around the ownership of land, woods, mills, and their associated industries. We are hopeful that these additional projects will lead to a better understanding of the extent of the Ghost Wood, the transition from industrial to recreational use and the purpose of the standing stones along the length of the brook. (See project report on the Standing Stones in Totley Brook).

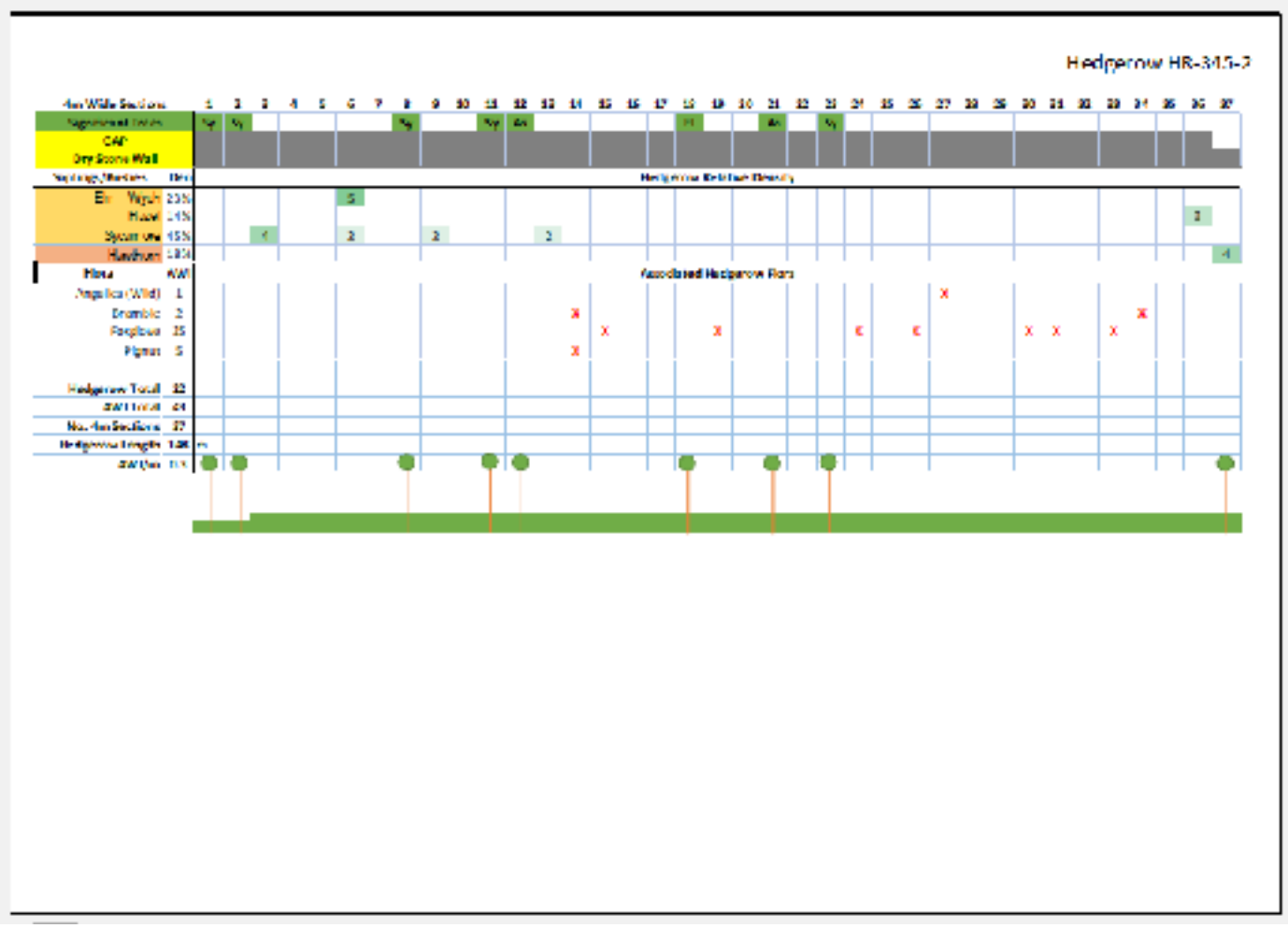
Hedgerow Outputs - The following pages are the graphical outputs from the Field Recording Sheet completed by surveying each hedgerow on the North side of the Brook between late May to early September. It is the intention of the FoGW field survey team to revisit each hedgerow to identify plants that were not in flower during this period


Hedgerow HR-360-1
4m Wide Sections
Significant Trees
GAP
Saplings/Bushes
Den
Hedgerow Relative Density
Ash
Elder
Field Maple
Hazel
Sycamore
Apple - Crab
Blackthorn
Hawthorn
Flora
AWI
Associated Hedgerow Flora
Black Bryony
Bramble
Dog Mercury
Hart's-tongue
Hedge Woundwort
Ivy (ground cover)
Ivy (Shrub)
Pignut
Rose - Dog
Rose - Field
Wood Avens
Hedgerow Total
AWI Total
No. 4m Sections
Hedgerow Length
AWI/m

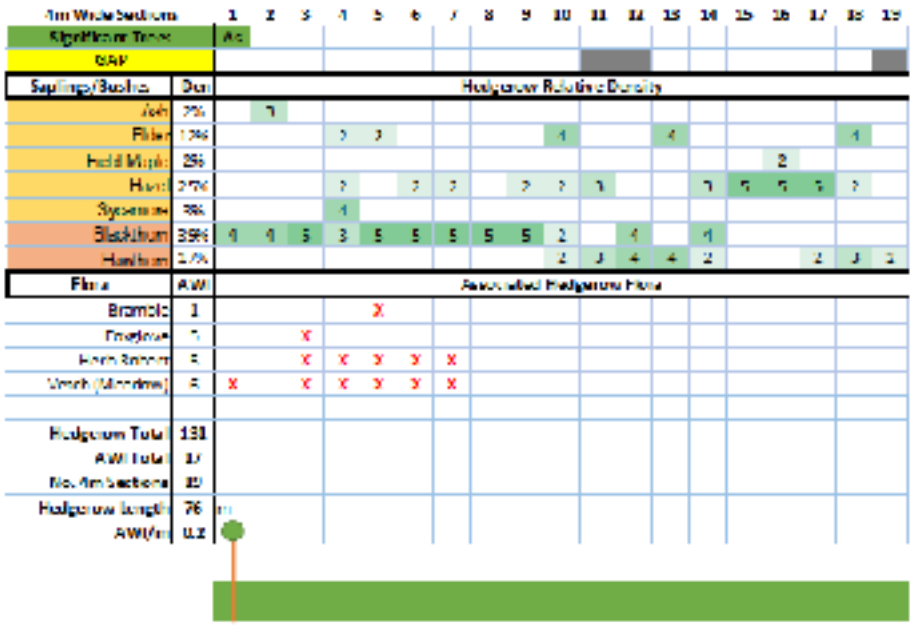

Hedgerow HR 345 1
4m Wide Sections
Significant Trees
GAP
Saplings/Bushes
Hedgerow Relative Density
Alder
Ash
Hazel
Oak
Rowan
Sycamore
Blackthorn
Hawthorn
Holly
Flora
AWI
Associated Hedgerow Flora
Bramble
Ivy (Shrub)
Pignut
Rose - Dog
Rose - Field
Wood Avens
Bonnet (Common)
Bonnet (Wood)
Nettle (Purple)
Willowherb
Hedgerow Total
AWI Total
No. 4m Sections
Hedgerow Length
AWI/m

Hedgerow HR-34h-1

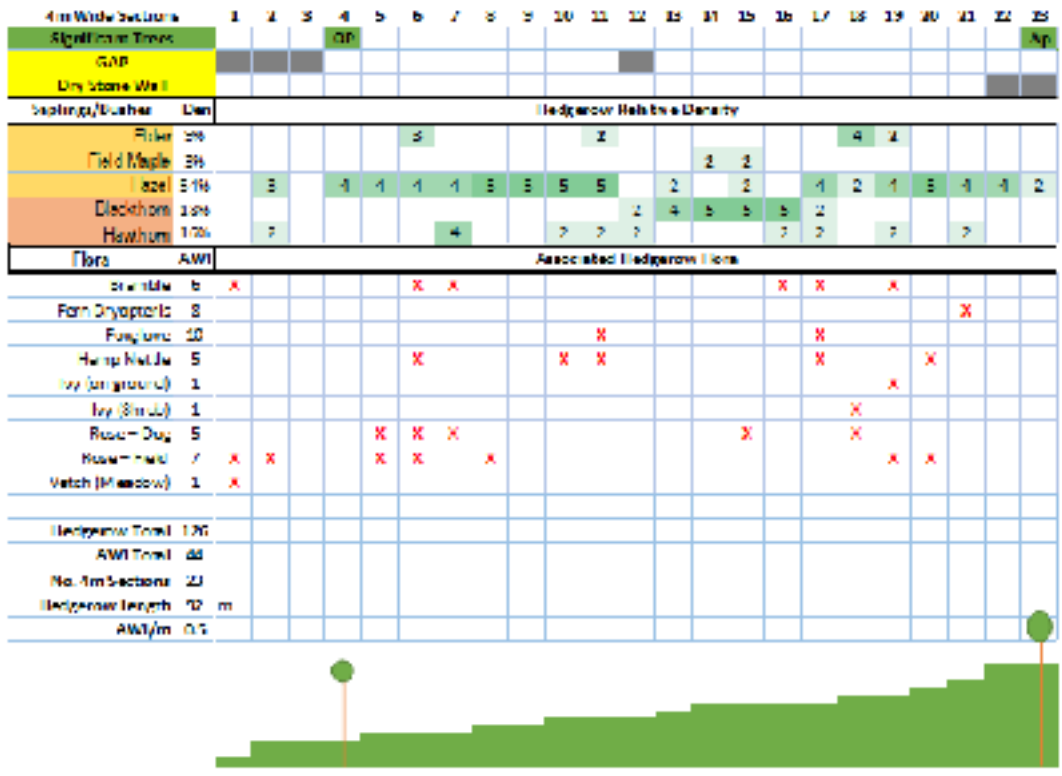


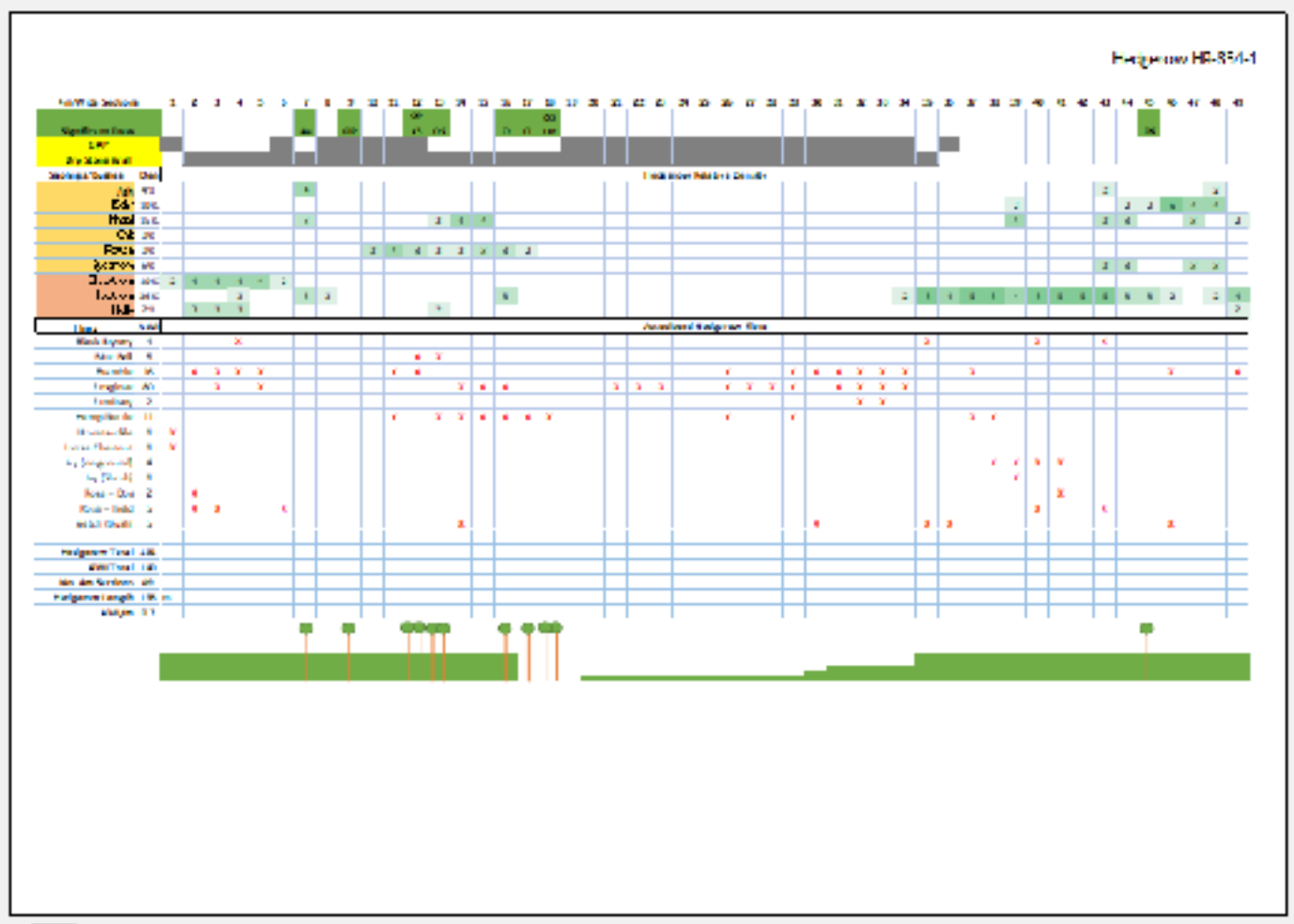

Hedgerow HR-345-2

Hedgerow HR 346 2



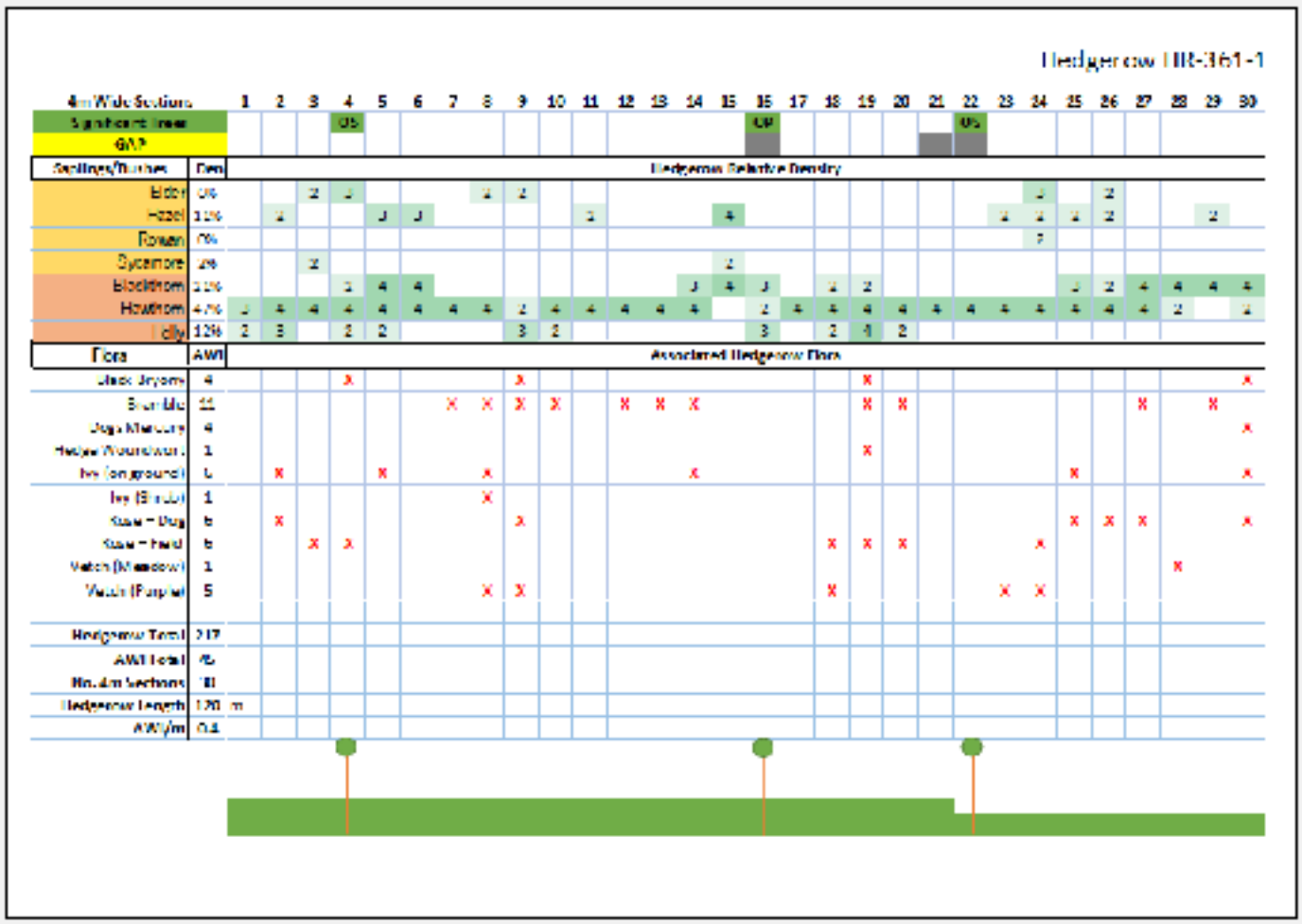
Hedgerow HR 346 3





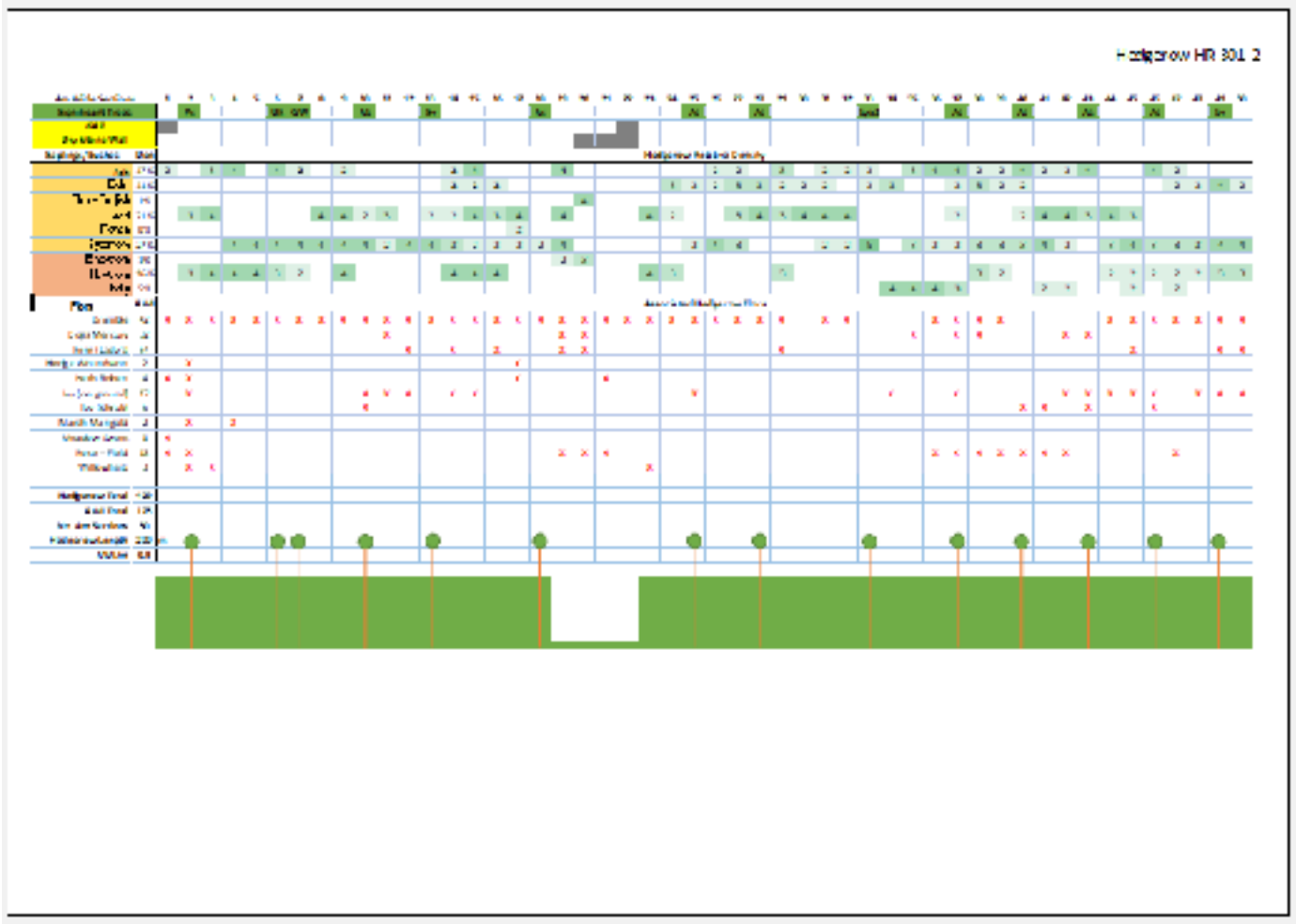
Hedgerow HR-372-2

4m Wide Sections	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Signif cant Trees																		
SAP																		
Dry Stone Wall																		
Saplings/Bushes	Den	Hedgerow Intensive Density																
Hawthorn	/5m	2																
Holly	/5m	2				4												
Flora	AWI	Ancient Hedgerow Flora																
Ivy (Hedera)	1	X																
Privet	20								X	X	X	X						
Hedge Woundwort	7		X				X	X	X			X						
Ivy (ground)	1	X																
Hedgerow Total	8																	
AWI Total	27																	
No. 4m Sections	18																	
Hedgerow Length	72	m																
AWI/m	0.4																	

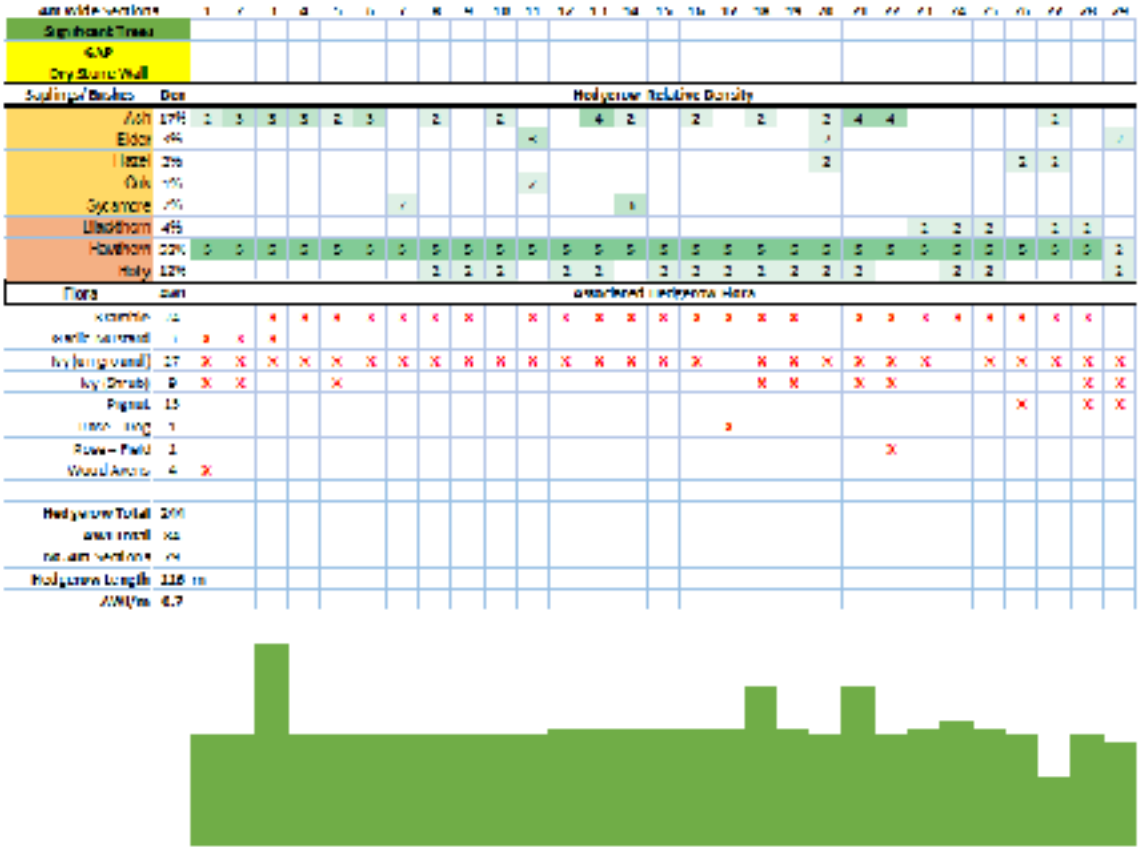

Hedgerow HR-361-1

Hedgerow HR 361 2

1m Wide Sections	1	2	3	4	5	6	7	8	9	10	11
Significant Trees								AS			
Saplings/Bushes	Dom	Hedgerow Relative Density									
Ash	4%								4		
Hazel	48%	4	4	4	4	4	4	4	4	4	4
Rowan	8%			2							
Willow - Grey	8%			4							1
Blackthorn	4%	2			2						
Dogwood	4%	2			2						
Guelder Rose	2%			2							
Hawthorn	22%		2	2	4	4	1		2		1
Holly	2%			2							
Flora	AWI	Associated Hedgerow Flora									
Dog's Mercury	2			X		X					
Bramble	4		X			X	X			X	
Downy Birch	1							X			
Fern (Lady's)	20		X		X	X			X	X	
Field Horsetail	5										X
Herb Robert	1				X						
Ivy (on ground)	1	X		X			X	X		X	
Ivy (Shrub)	1			X							
Nipple Wort	1								X		
Nose Lead	5			X	X		X	X	X		
Wood Sorrel	2					X	X		X	X	X
Hedgerow Total	89										
AWI Total	54										
No. 1m Sections	11										
Hedgerow Length	44	m									
AWI/m	1.5										

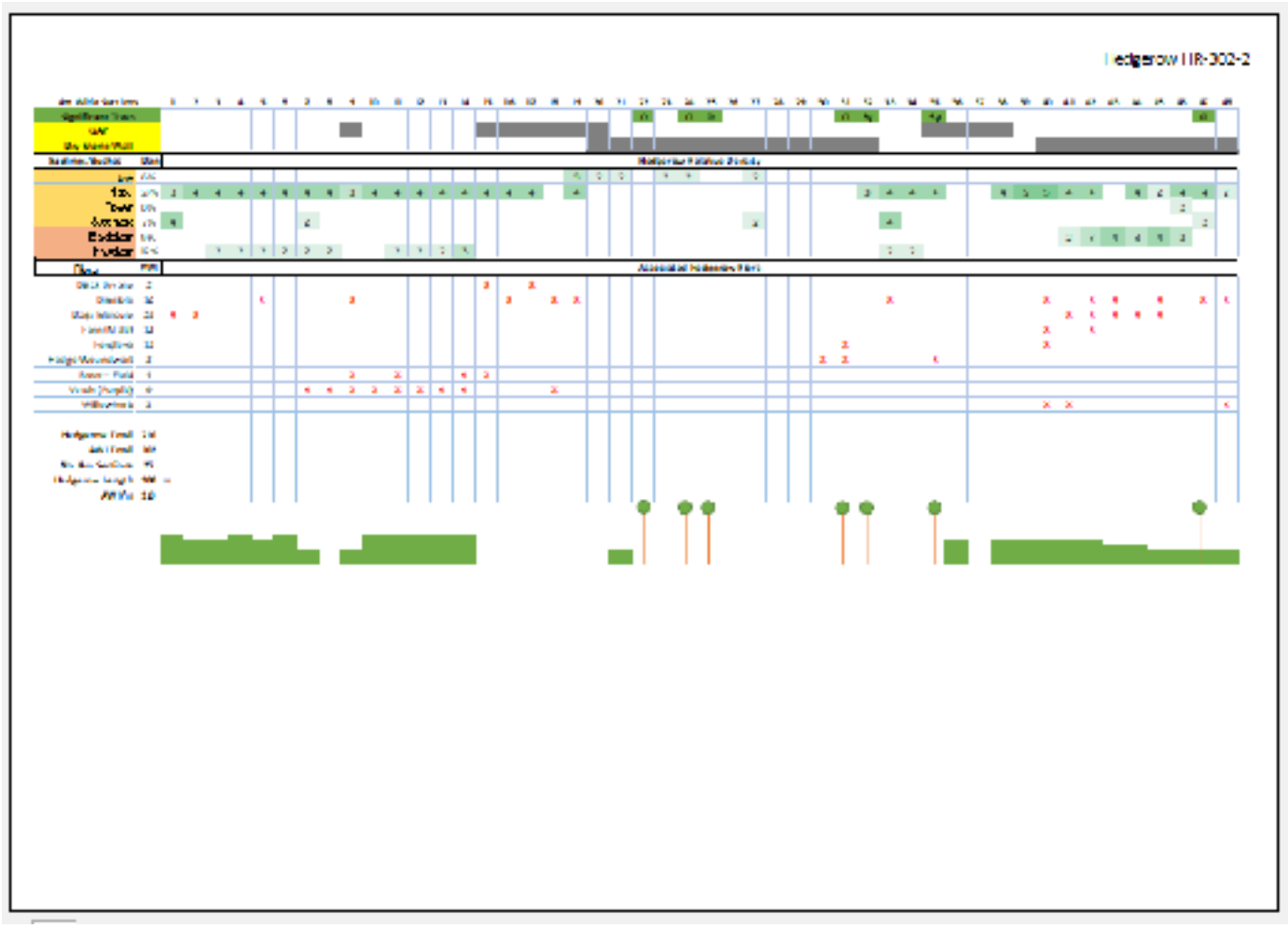


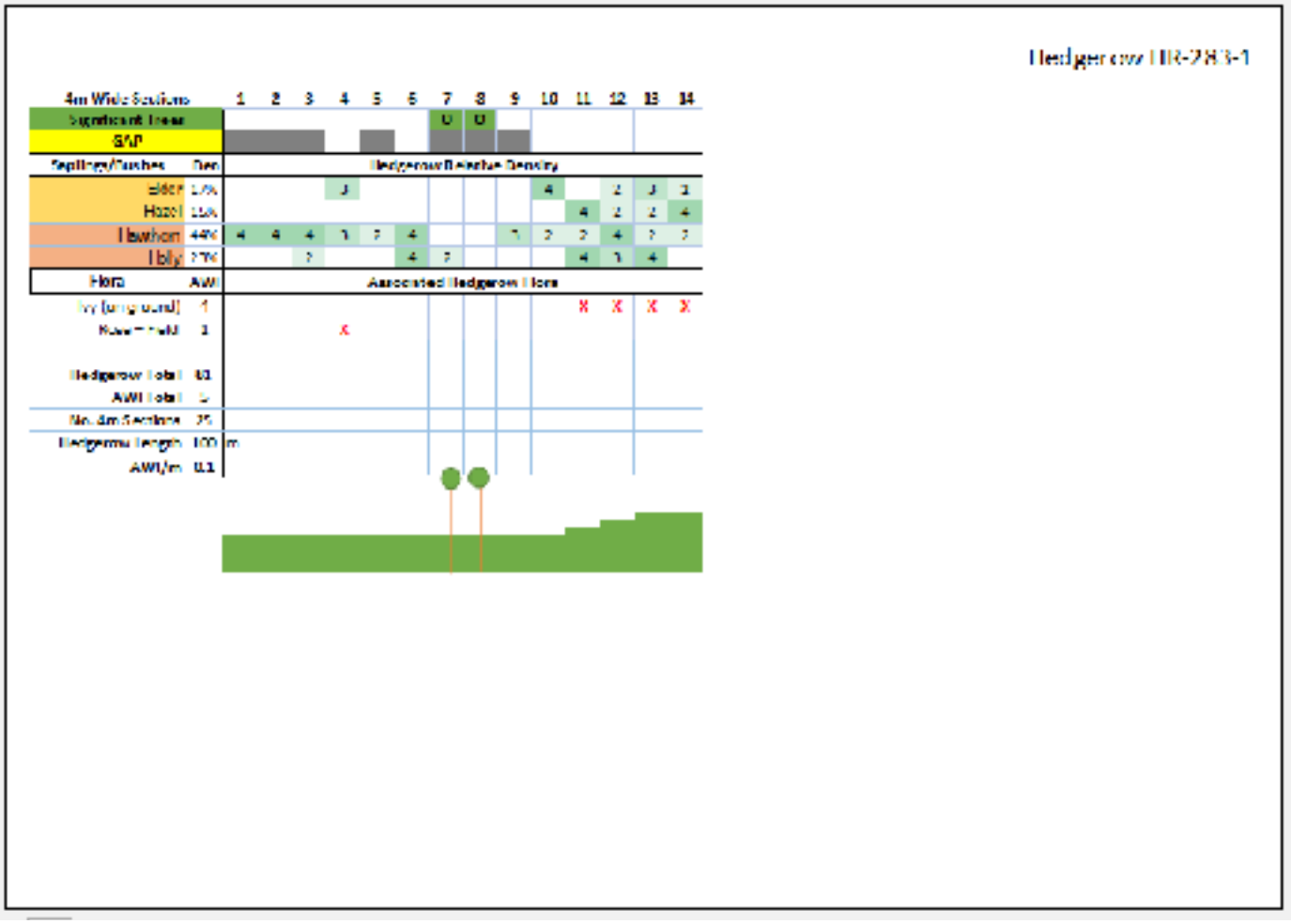
Hedgerow HR-283-3



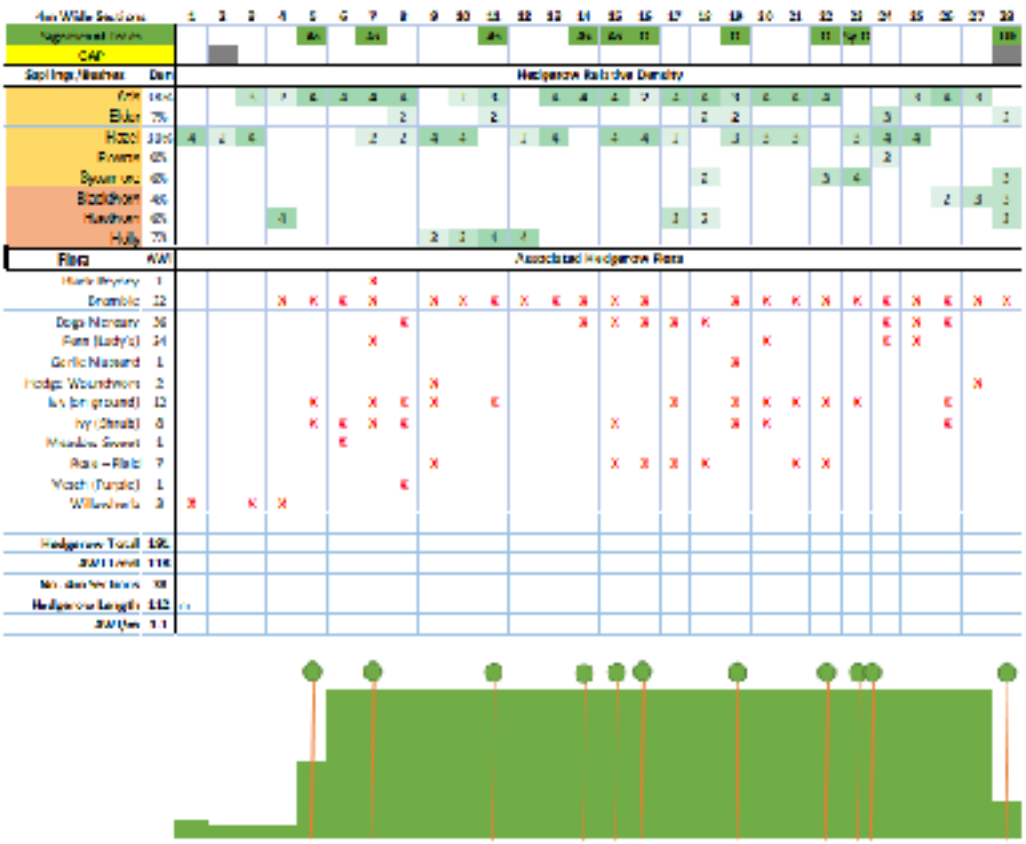
Hedgerow HR-3172-1

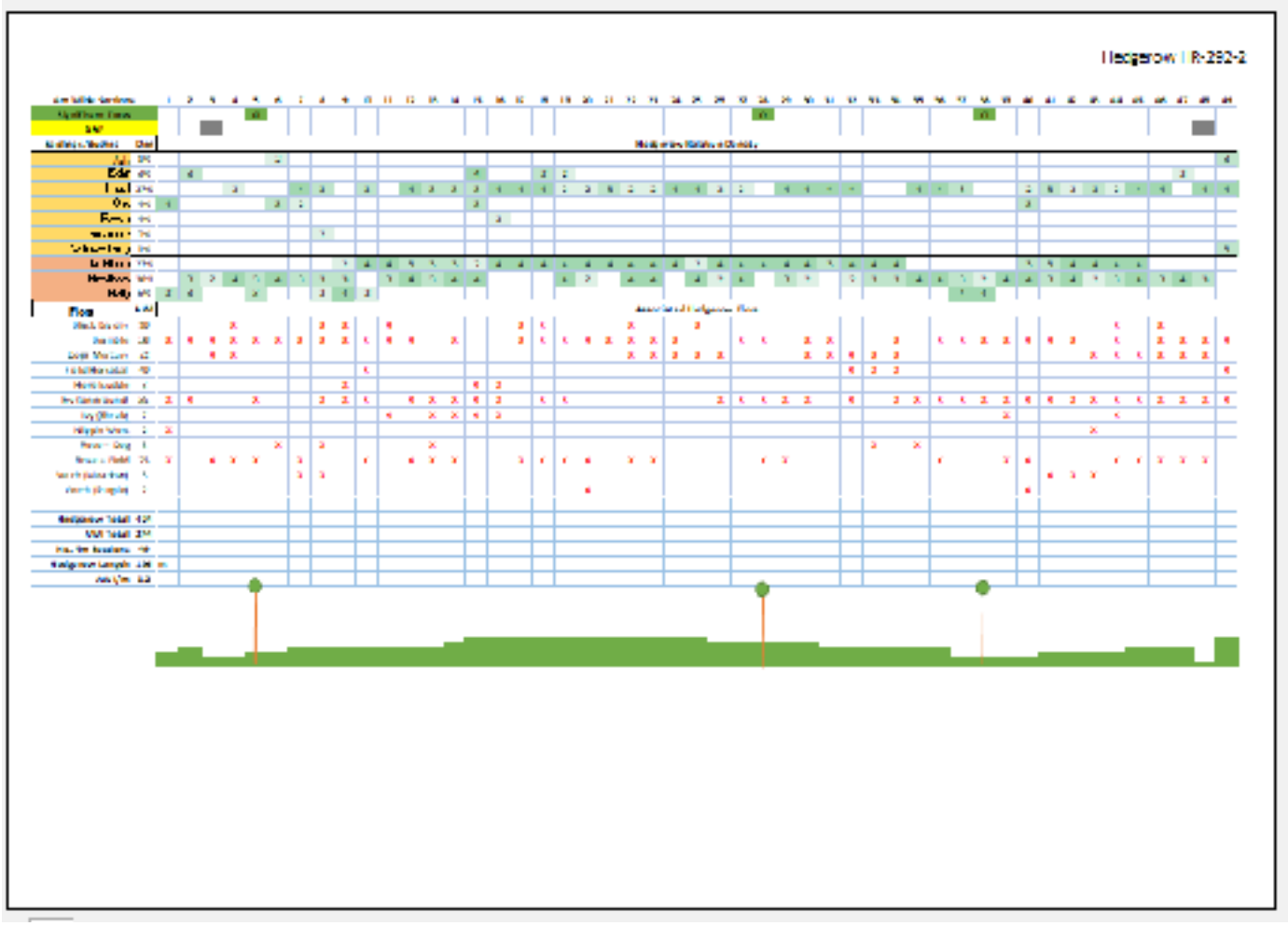
4m Wide Sections		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Significant Trees		U	U				Au					Au		Au						U
GAP																				
Saplings/Bushes	Den	Hedgerow Relative Density																		
Ash	15%				1	4		4						1			2			
Elder	2%															2				
Hazel	11%													5	4		5	4		
Oak	4%			3	2	2														
Blackthorn	18%								2	1	5	5			2	1				
Hawthorn	30%			1	3		2	3	5	1	2		3	2		1	1			
Holly	11%	4	4	2		2	2								4	1				2
Flora	AWI	Associated Hedgerow Flora																		
Black Bryony	1																	X		
Bramble	4					X	X	X	X											
Dog's Mercury	4													X						
Ivy (on ground)	1					X	X	X	X											
Rose – Field	2	X	X	X	X	X											X	X		
Hedgerow Total	122																			
AWI Total	20																			
No. 4m Sections	19																			
Hedgerow Length	76	m																		
AWI/m	0.3																			

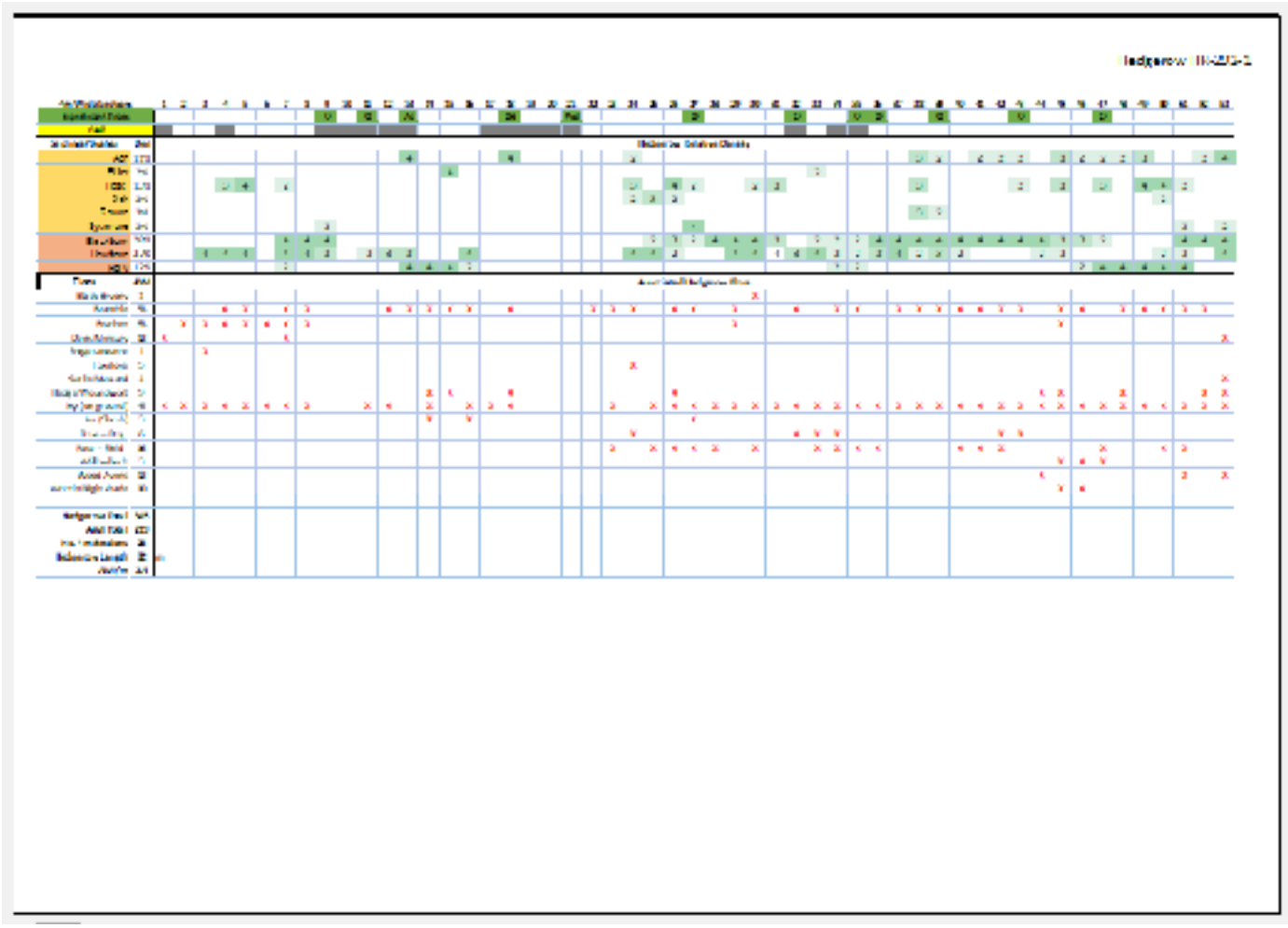

Hedgerow HR-302-2

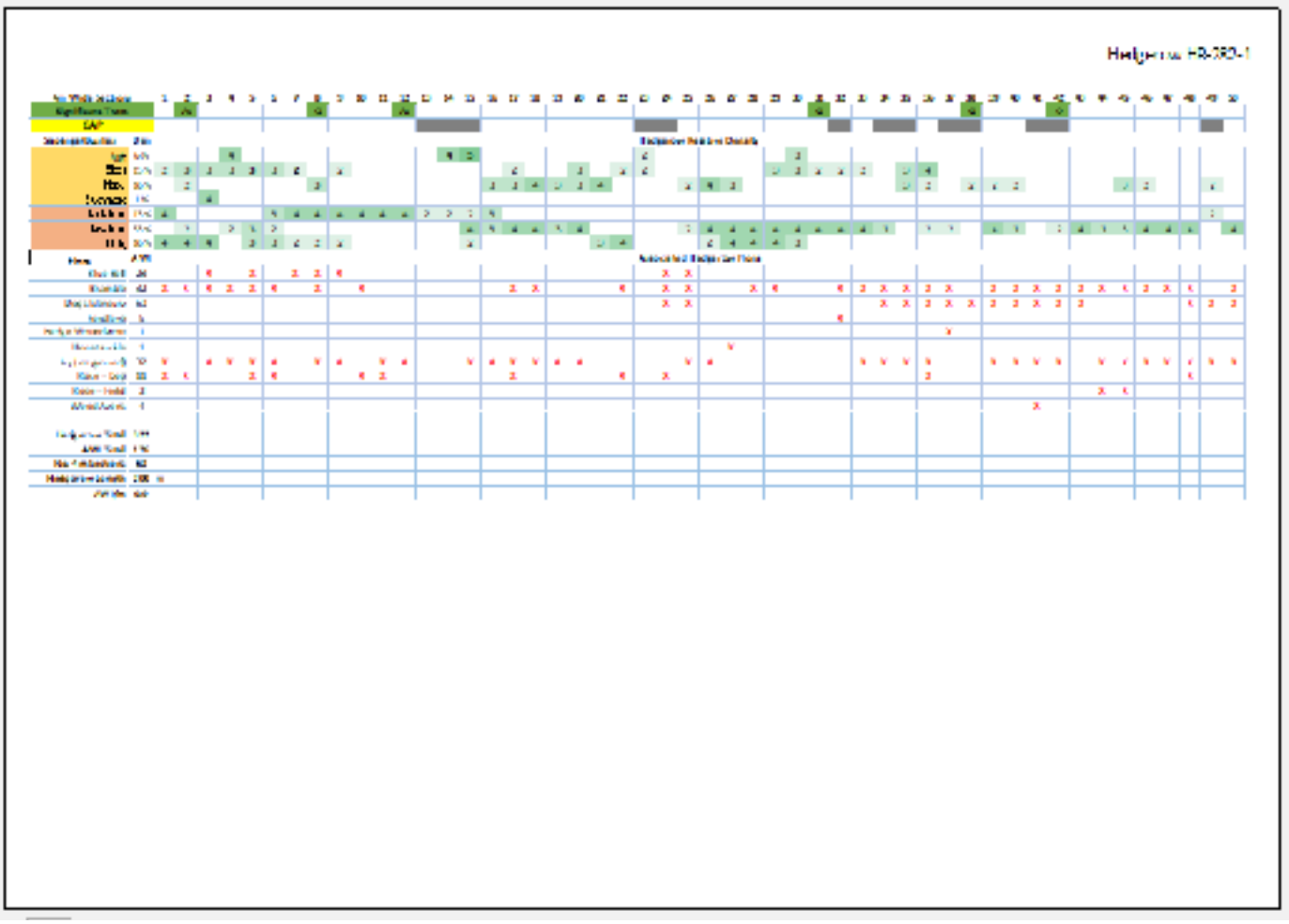

Hedgerow HR-2813-1
4m Wide Sections
1 2 3 4 5 6 7 8 9 10 11 12 13 14
Significant Trees
SAP
Saplings/Bushes
Hedgerow Bushes Density
Hazel
Hawthorn
Holly
Flora
AWI
Associated Hedgerow Flora
Hedgerow Total
AWI Total
No. 4m Sections
Hedgerow Length
AWI/m

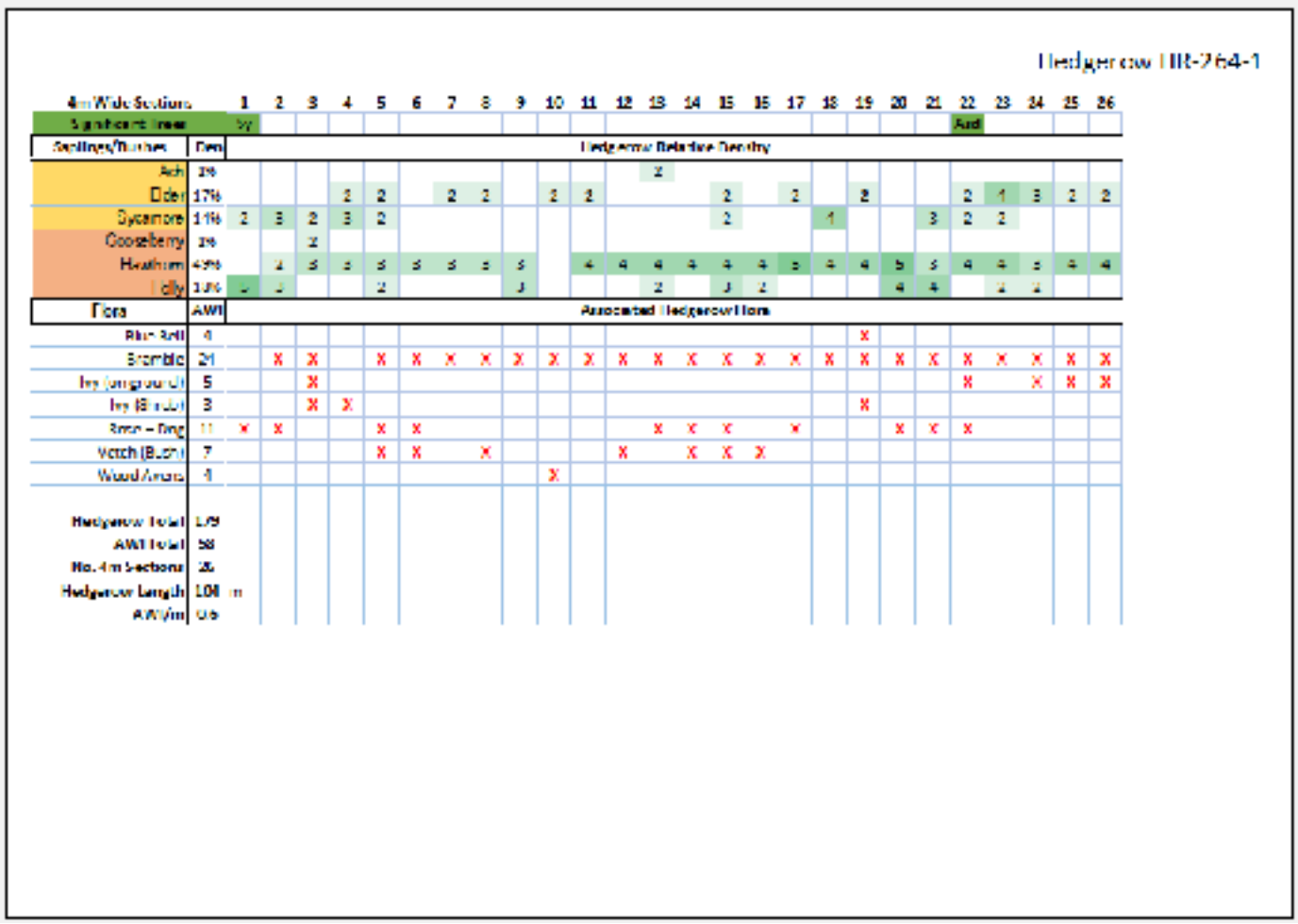
Hedgerow HR-262-3

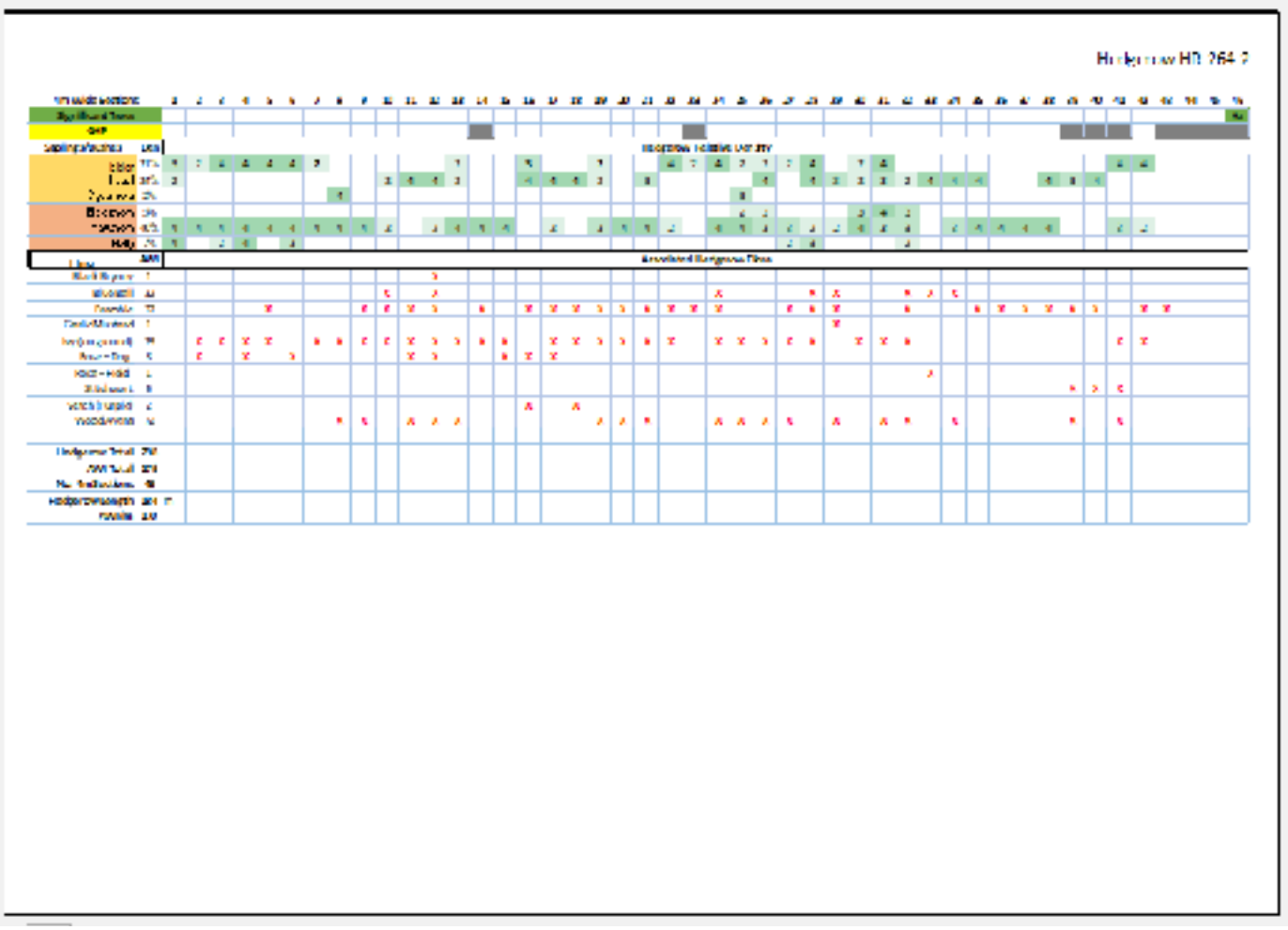


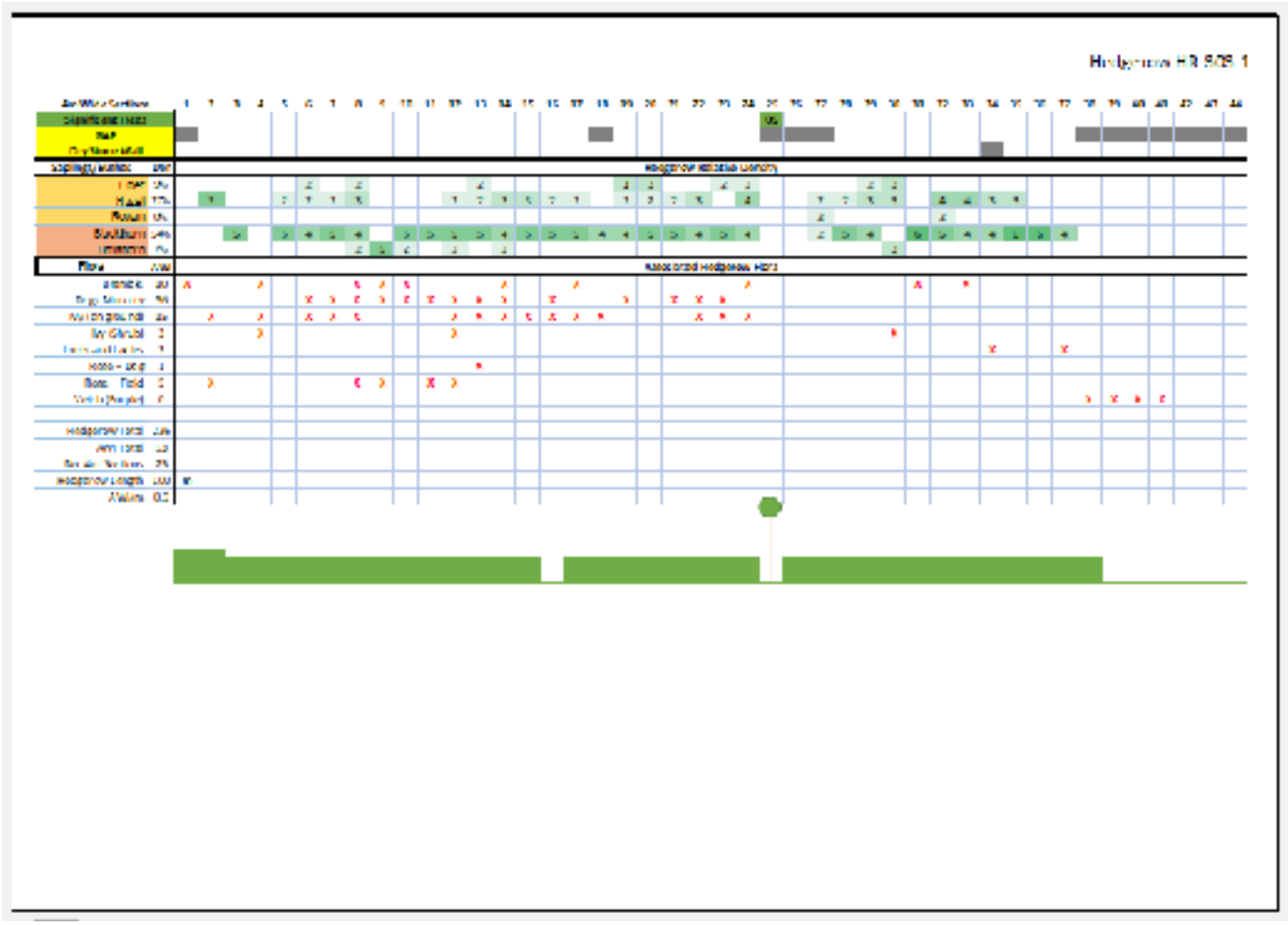


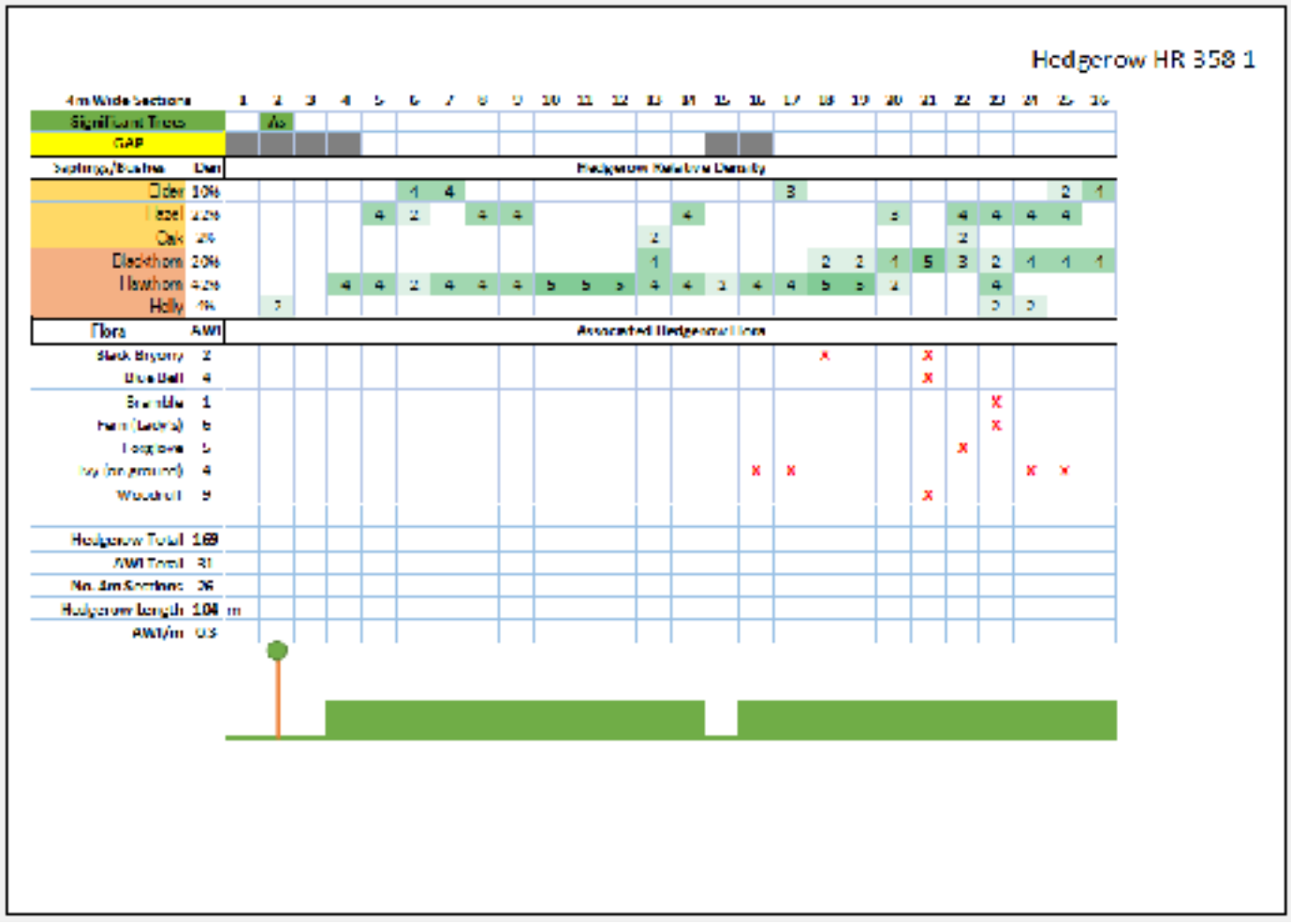


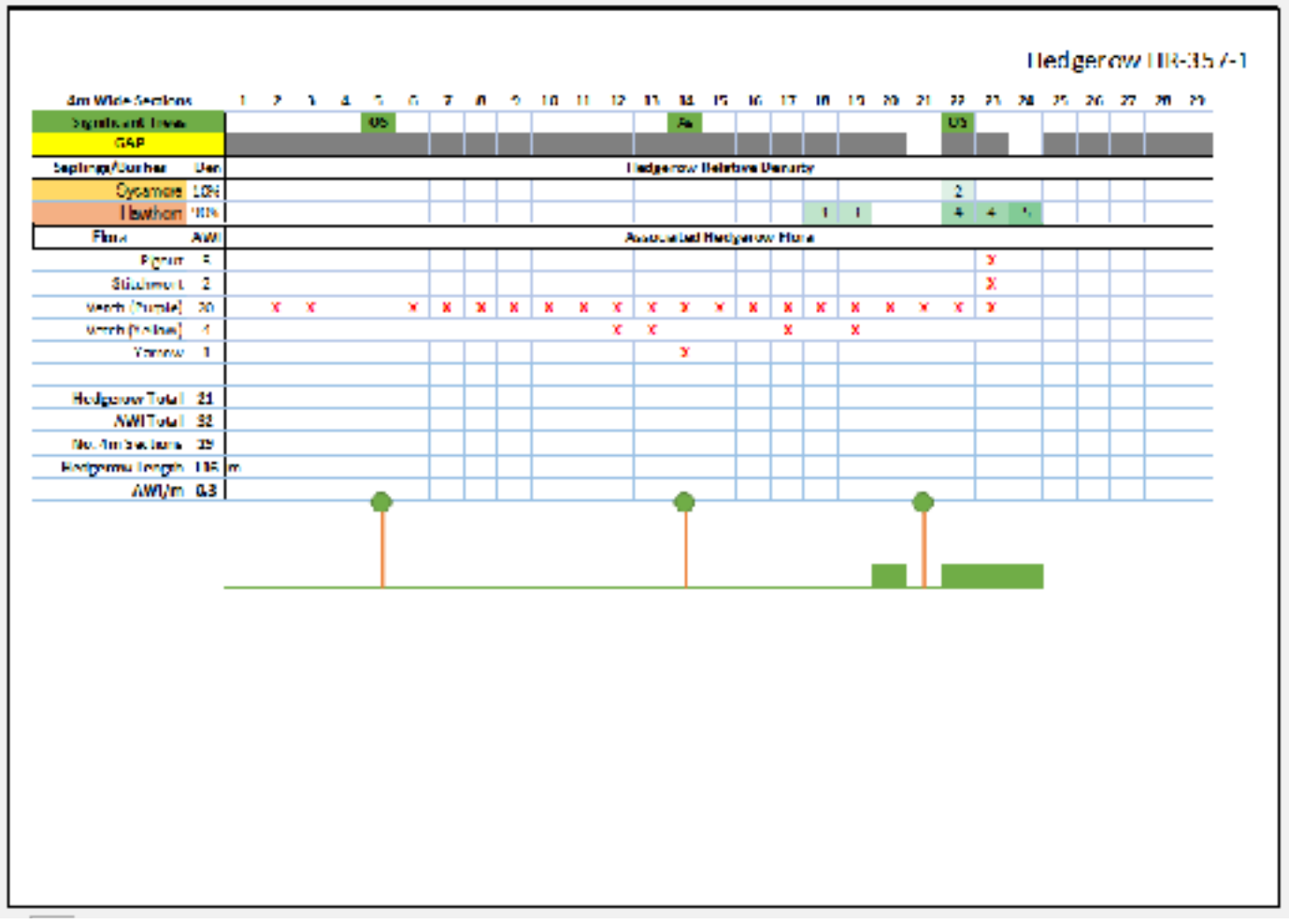


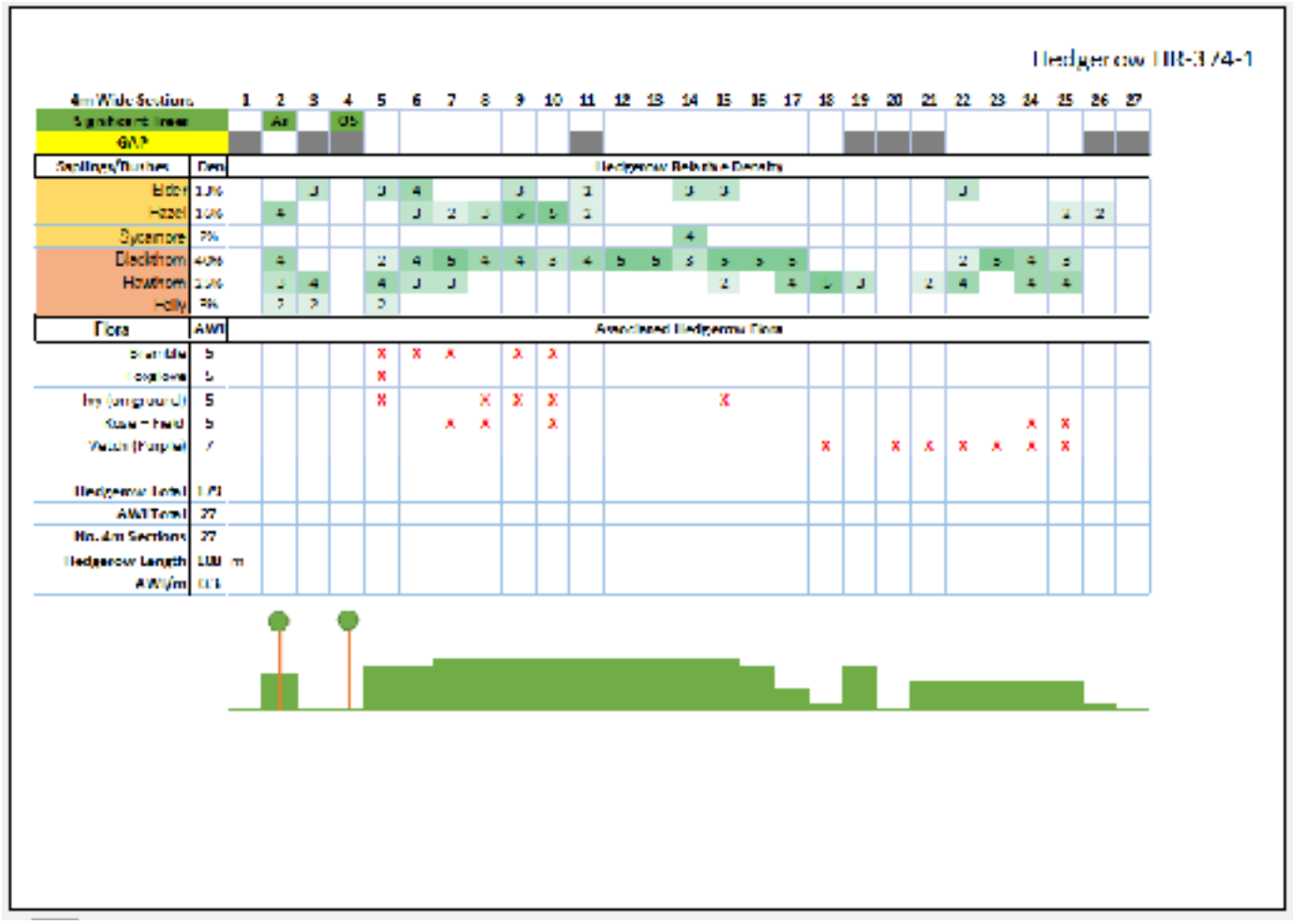

Hedgerow HR-764-1
4m Wide Sections
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
Significant Trees
Sy
Aud
Saplings/Trunks
Den
Hedgerow Relative Density
Ash 1%
Elder 17%
Sycamore 11%
Gooseberry 1%
Hawthorn 49%
Holly 11%
Flora
AWI
Associated Hedgerow Flora
Blue Bell 4
Bramble 24
Ivy (ground cover) 5
Ivy (Shrub) 3
Nettle 11
Vetch (Bush) 7
Wood Anem. 4
Hedgerow Total 1/9
AWI Total 58
No. 4m Sections 26
Hedgerow Length 104 m
AWI/m 0.6






Hedgerow HR 358 1


Hedgerow HR-35 /-1


Hedgerow HR-3 /4-1
4m Wide Sections
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27
Hedgerow Relative Density
Flora
Associated Hedgerow Flora

AWI Rating Look-up Table

Flora	Score	Flora	Score
Angelica (Wild)	1	Meadow Sweet	1
Aspen	1	Millium Effusium	8
Bellflower (Giant)	6	Moschatel	8
Black Bryony	1	Nipple Wort	1
Blue Bell	4	Orchid (Early Purple)	9
Bramble	1	Pignut	5
Bracken	7	Primrose	8
Bugle	4	Ramsoms	8
Buttercup (Goldilocks)	6	Rose - Dog	1
Climbing Corydalis	6	Rose - Field	1
Common Cow-wheat	8	Rowan	1
Crab Apple	5	Sedge	8
Deadnettle (White)	2	Sedge (Large)	6
Dogs Mercury	4	Sedge(remote)	8
Dog-violet	6	Silver Birch	1
Dogwood	1	Sorrel (Common)	7
Downy Birch	1	Sorrel (Wood)	7
Enchanted Nightshade	4	Stitchwort	2
Euphorbia amygdaloides	8	Toothwort (Common)	9
Fern (Hard Shield)	6	Vetch (Meadow)	1
Fern (Lady's)	6	Vetch (Purple)	1
Fern (Male)	6	Vetch (Yellow)	1
Fern (Oak)	8	Vetch (Bush)	1
Fern (Soft Shield)	6	Water Avens	8
Fern Dryopteris	8	Wavey Hair Grass	6
Field Horsetail	8	Willowherb	1
Forget-me-not	1	Wood Anenome	8
Foxglove	5	Wood Avens	4
Fumitary	1	Wood false Broom	5
Garlic Mustard	1	Wood Sorrel	7
Golden Sage (opposite-	8	Wood Speedwell	7
Gorse	1	Woodruff	9
Hedge Woundwort	1	Woodrush (Great)	7
Hemp Nettle	1	Woody Nightshade	5
Herb Bennet	1	Yarrow	1
Herb Paris	9	Yellow Archangel	8
Herb Robert	1	Yellow Pimpernel	7
Honeysuckle	1	Numbers in **black** refer to Dr B Wright's AWI weighting.	
Horse Chestnut	1		
Ivy (on ground)	1	Numbers in **red** refer to estimates by FoGW given to a suggested list of AWI plants from the Woodland Trust website.	
Ivy (Shrub)	1		
Lily of the Valley	8		
Lords and Ladies	3		
Marsh Marigold	1		

Appendix

Hedgerow Graphical Analysis System (HGAS)

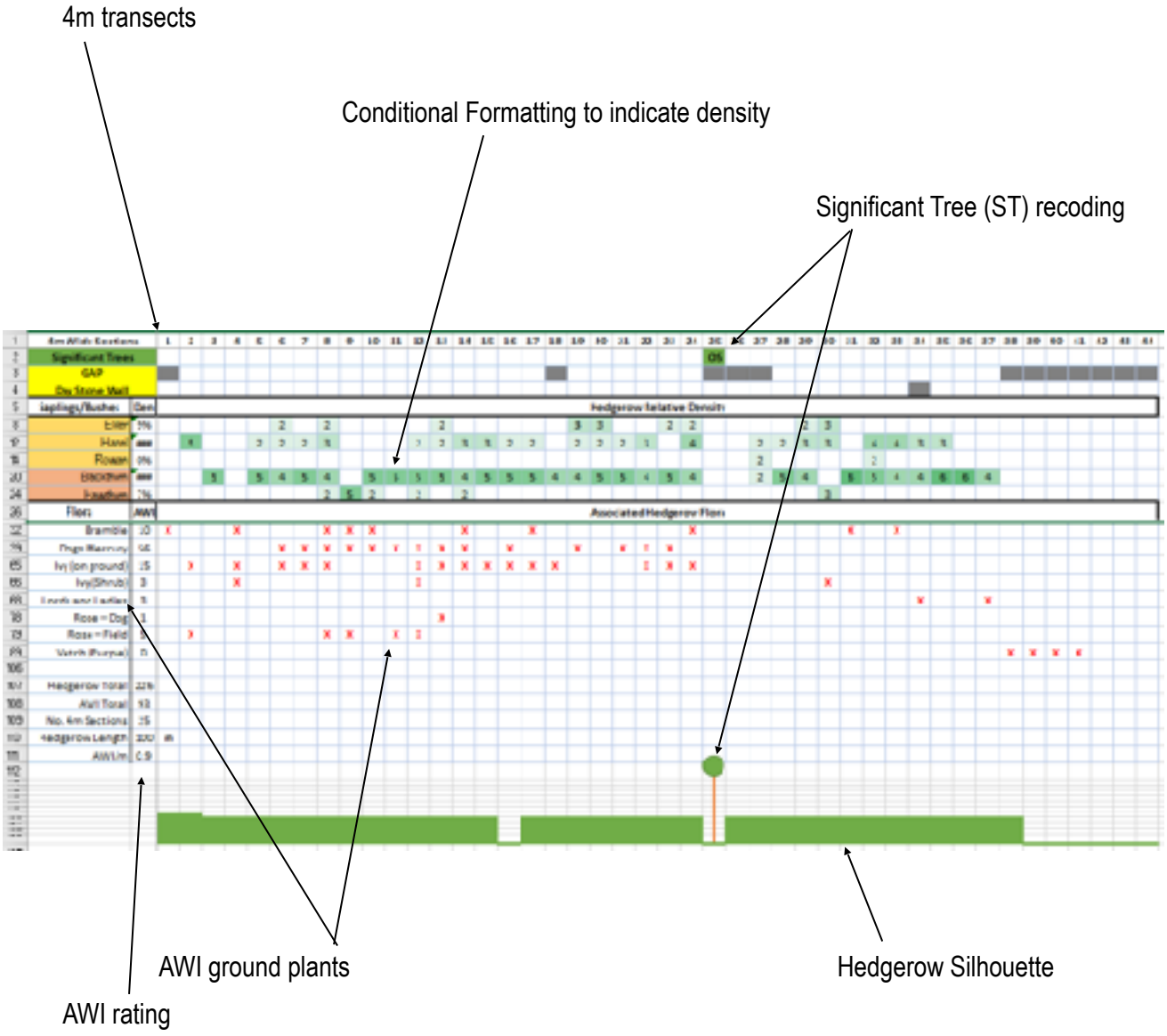
The HGRAS uses Excel Spreadsheet. A template is used for each sheet and the number of columns (60 maximum suited FoGW requirements) not utilised are hidden (not deleted). The number of columns used is entered manually in cell B108 and this calculates the hedgerow length cell B110.

Working from the Field Recording Sheets (FRS) the ST's, GAPS and Dry-Stone Walling are blocked in. The ST's automatically fill in when any text is placed in a cell.

The spider recording icons on the FRS are converted to a score of 2-6 1=no presence, 2=occasional and 6 = super abundant). The conditional formatting in Excel then interoperates this rating as a shade of green where light green (2) = least dense and dark green (6) = most dense.

Finally, the presence (not abundance) of AWI flora is marked with an '**X**', each mark attracts a score attributed according to its significance to AWI. The AWI rating is on a hidden 'Look-up' table (see page 29 for ratings). The black ratings are Dr Barry Wrights and the red ratings are estimates by FoGW based on research. All of the ratings can be adjusted. Unused AWI rows are hidden (not deleted).

The cumulative AWI score is shown at the bottom of the table in cell B109 and divided by the hedgerow length to give an average AWI/m. This is not a perfect rating system; however, it does give an indication of the potential for the hedgerow to be an AWI.



Example - Significant Tree Record

FoGW Significant Tree Ref.				ST-	0	0	0	1
Date	WP	Easting	Northing	Survey Team Members				Sheet
12-06-17	018	30761	79464	KW				1 of 2
Species		Trunk Dia	Height m	Spread m	Dead / Alive		Standing / Fallen	
Copper Beech		1.3m	17	25	Alive		Standing	

Photographic Evidence

Camera Ref	SD Card	Frame No.	FoGW Photo Ref	Description
KW	KW1	-	STP - 0001 - 001	Archive from estate outside Totley Hall
KW	KW1	66	STP - 0001 - 002	Main trunk(s) facing South
KW	KW1	67	STP - 0001 - 003	Main trunk(s) facing West
KW	KW1	68	STP - 0001 - 004	Main trunk(s) facing East
			STP - - 005	
			STP - - 006	
			STP - - 007	
			STP - - 008	
			STP - - 009	
			STP - - 010	

Physical Attributes of Tree

Maiden	Y/N	Does the tree appear natural in growth without intervention?
Pollard	Y/N	Are there multiple limbs from top of main trunk?
Coppiced	Y/N	Are there multiple stems from base of tree? No of Stems
Stump	Y/N	The tree is on the ground and a stump remains in situ?
Hollow Trunk	Y/N	Is a void visible to the inside of the tree at any point?
Diseased	Y/N	Are there any signs of disease? Note any signs in box below.
Fungi	Y/N	Are there any fungi growing on the trunk and/or branches?
Bird Nests	Y/N	Are there signs of nesting in the tree? Note size and number below.
Bats	Y/N	Are there signs of bats in the tree? Note size and number below.

Notes

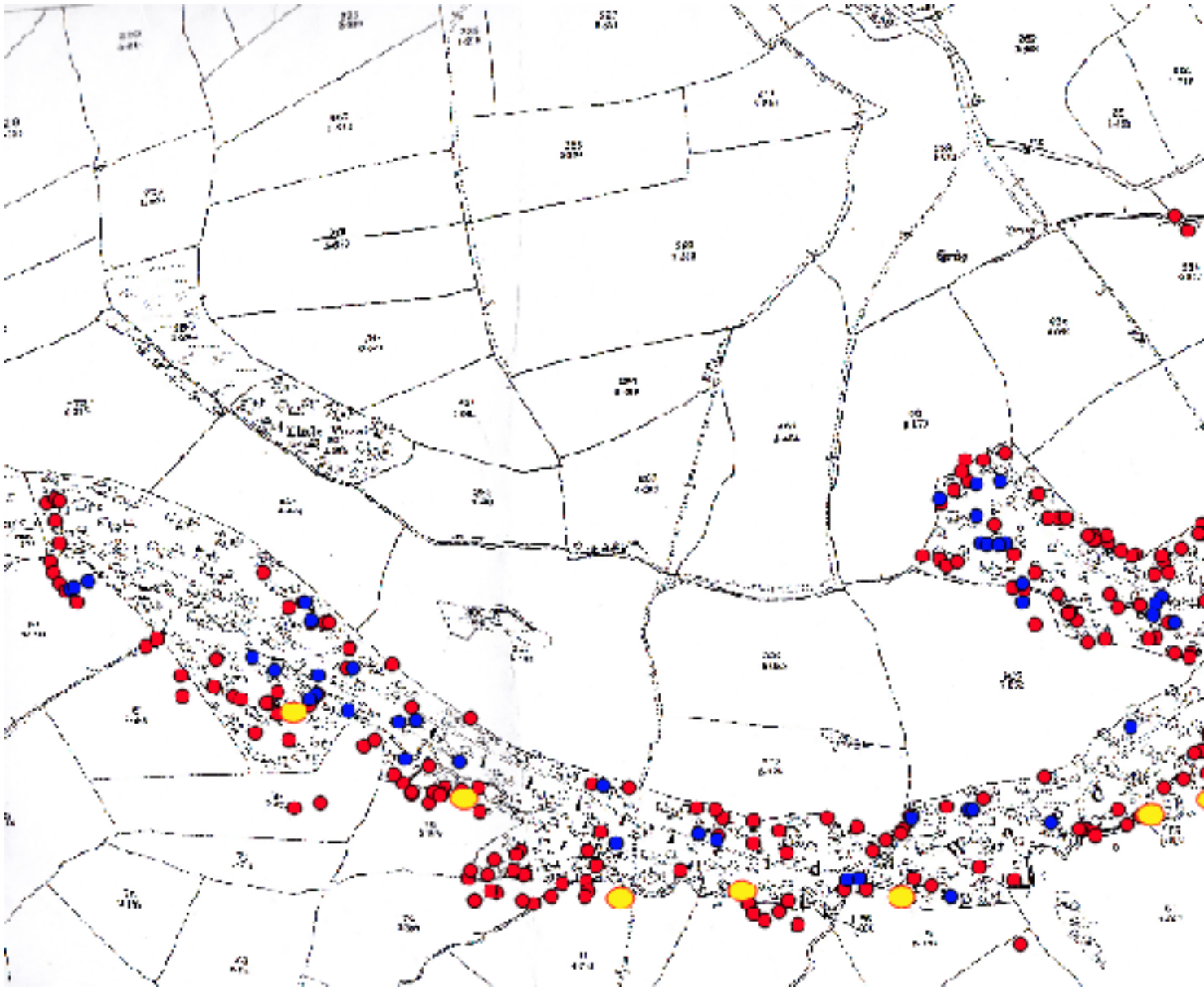
On estate prior to HR264-1 hedgerow gate.
Cluster planted? Barry to confirm
6 major limbs average 30cm dia.
Circumferance around waist 4.2m

Photographic Profile (Leave blank for photographic records)

STP – 0001 – 001

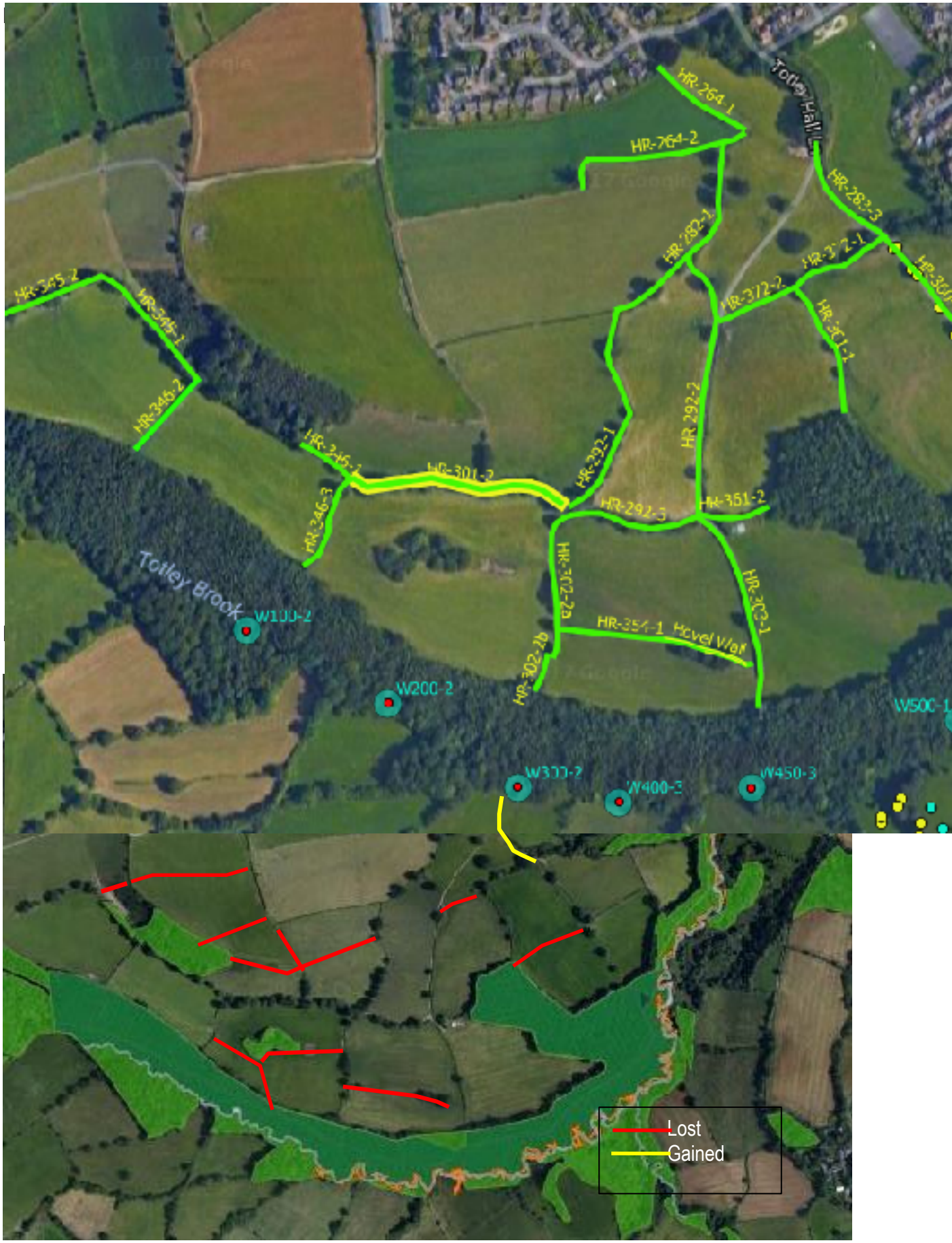
STP – 001 - 002

Map 1 – Trees and stump's =>1m dia recorded in HLF Project 1 in 2012/13 by FoGW



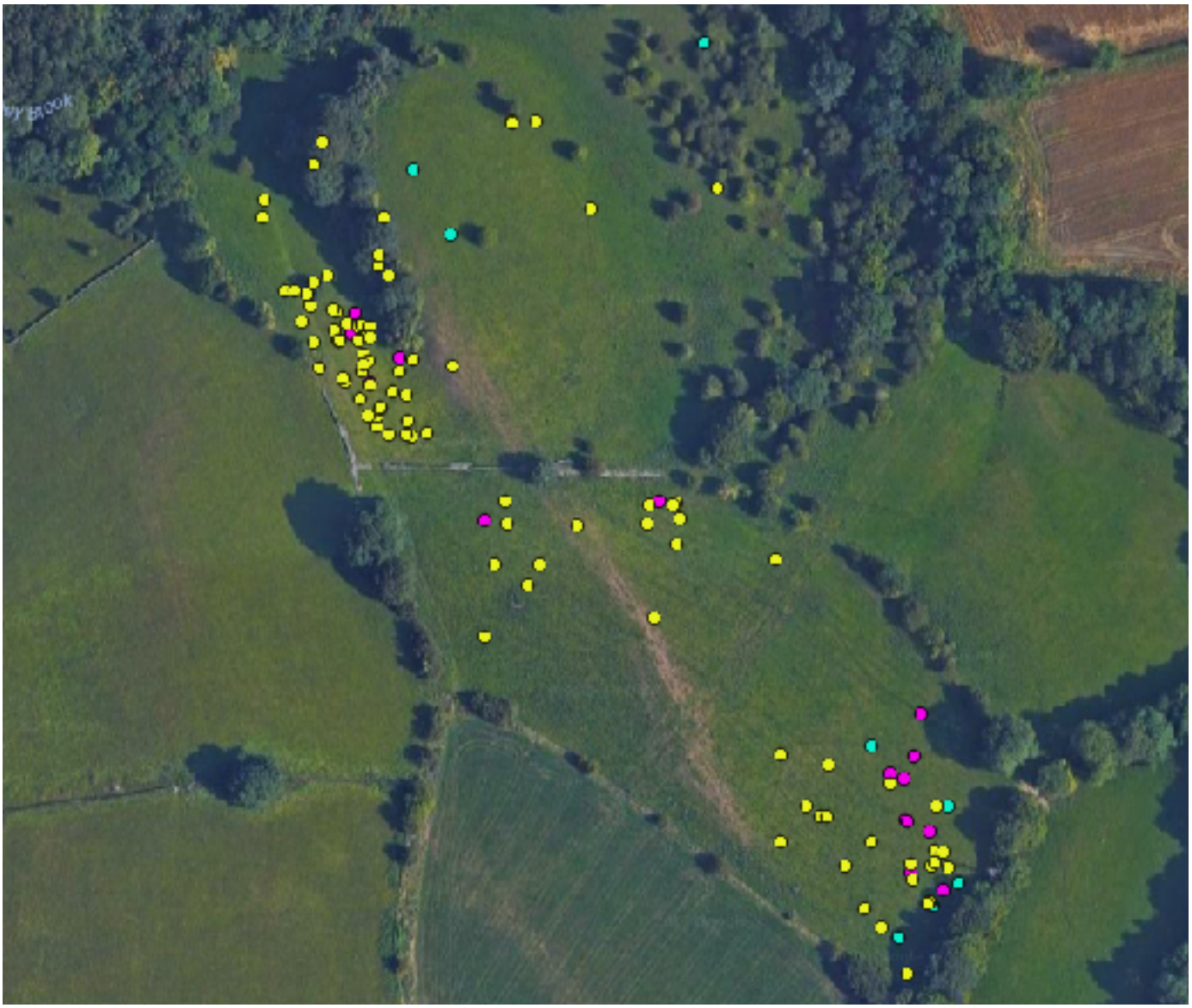
=>1m trunk trees =>1m trunk stumps =Stone post sites

Map 2 – 2017 FoGW Hedgerow Survey


HR-264-1
HR-764-2
HR-282-3
HR-282-2
HR-372-1
HR-372-2
HR-345-2
HR-345-1
HR-346-2
HR-346-3
HR-245-1
HR-301-2
HR-292-1
HR 292-2
HR-292-3
HR-361-2
HR-361-1
HR-762-2a
HR-762-2b
HR-303-1
HR-354-1
Hovel Wat
Toiley Brook
W100-2
W200-2
W300-2
W400-3
W450-3
W500-1
Lost
Gained

Map 5 – Significant trees recorded in hedgerow / fields

Map 6 – Waxcap Survey



Map 7 – Identifying the Ghost Wood with Ancient Field Names

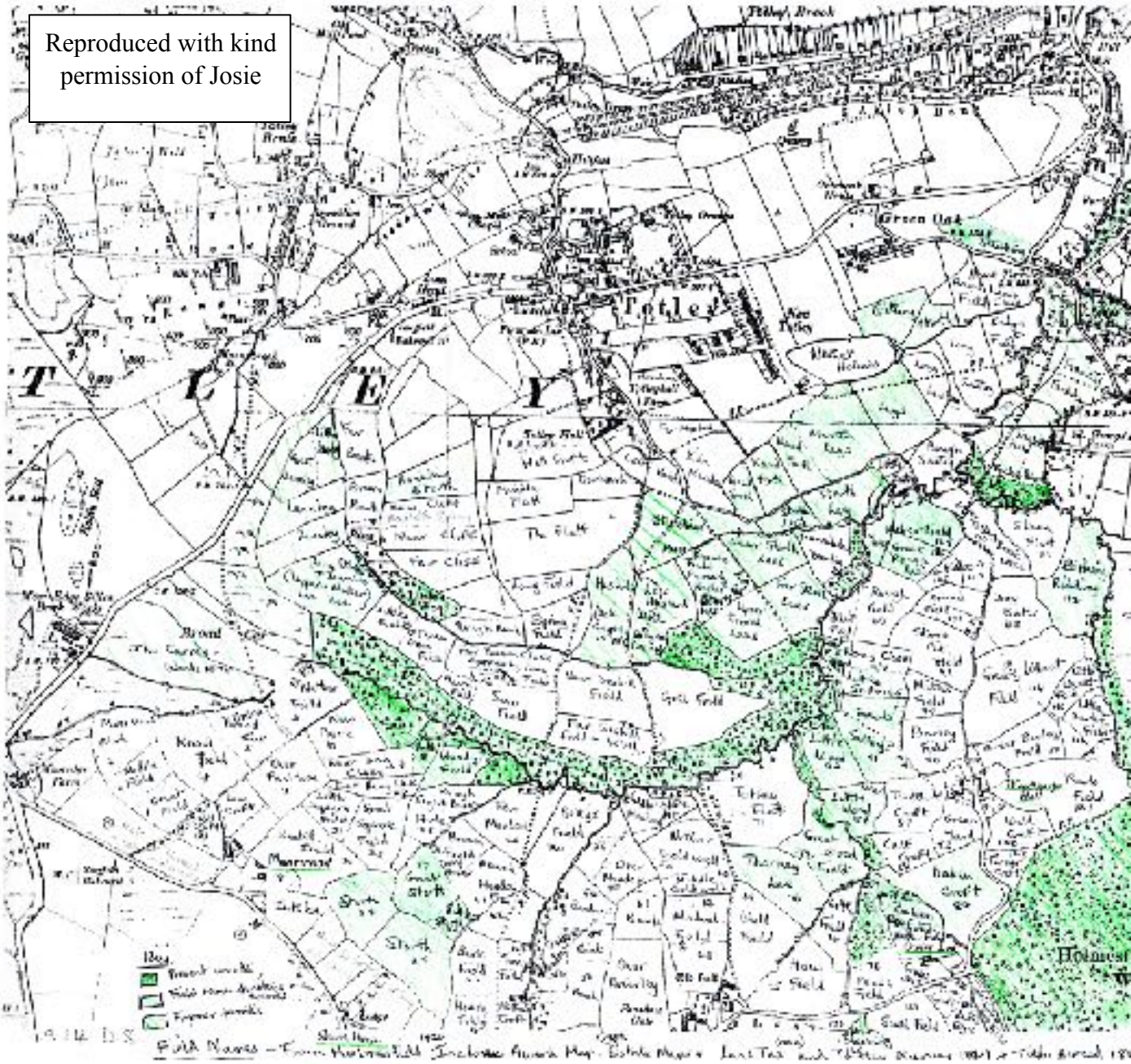

Reproduced with kind permission of Josie
Green Oak
Holmest

Photo Gallery

Acknowledgements

We have contacted many people during our yearlong HLF2 Project. We owe them and anyone we have forgotten to include below our sincere thanks for the time they have given to us.

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