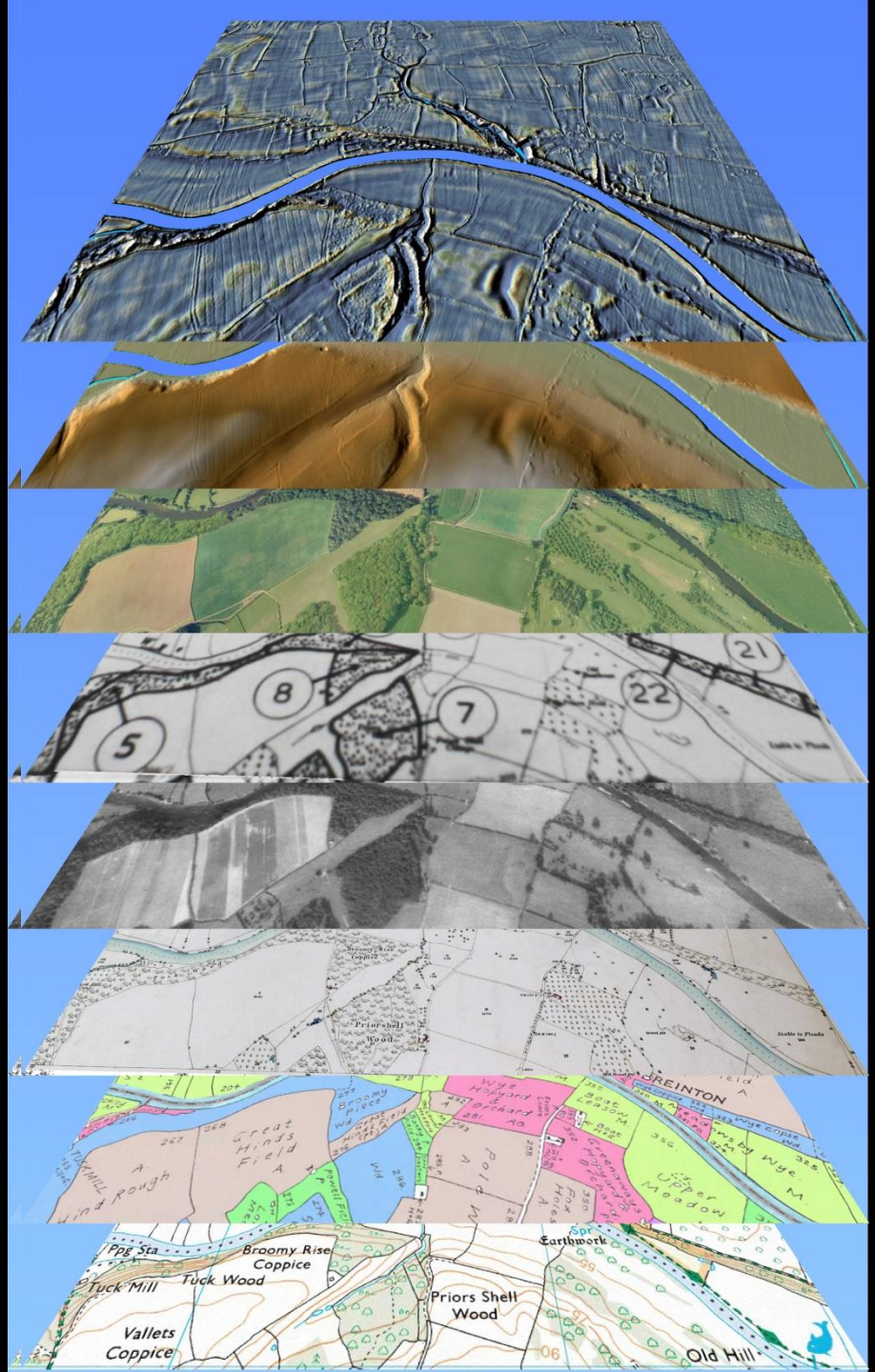
FOSS4G for Heritage and Habitat

As applied to nature recovery and landscape heritage projects in Herefordshire

FOSS4G Bristol 12th Nov2024

Geo-referencing digital images to create raster sequence of layers



LIDAR DTM
Slope amplified

LIDAR DTM
free from EA

Virtual Earth
Microsoft

1953 census
of woods

1947 RAF
airphoto

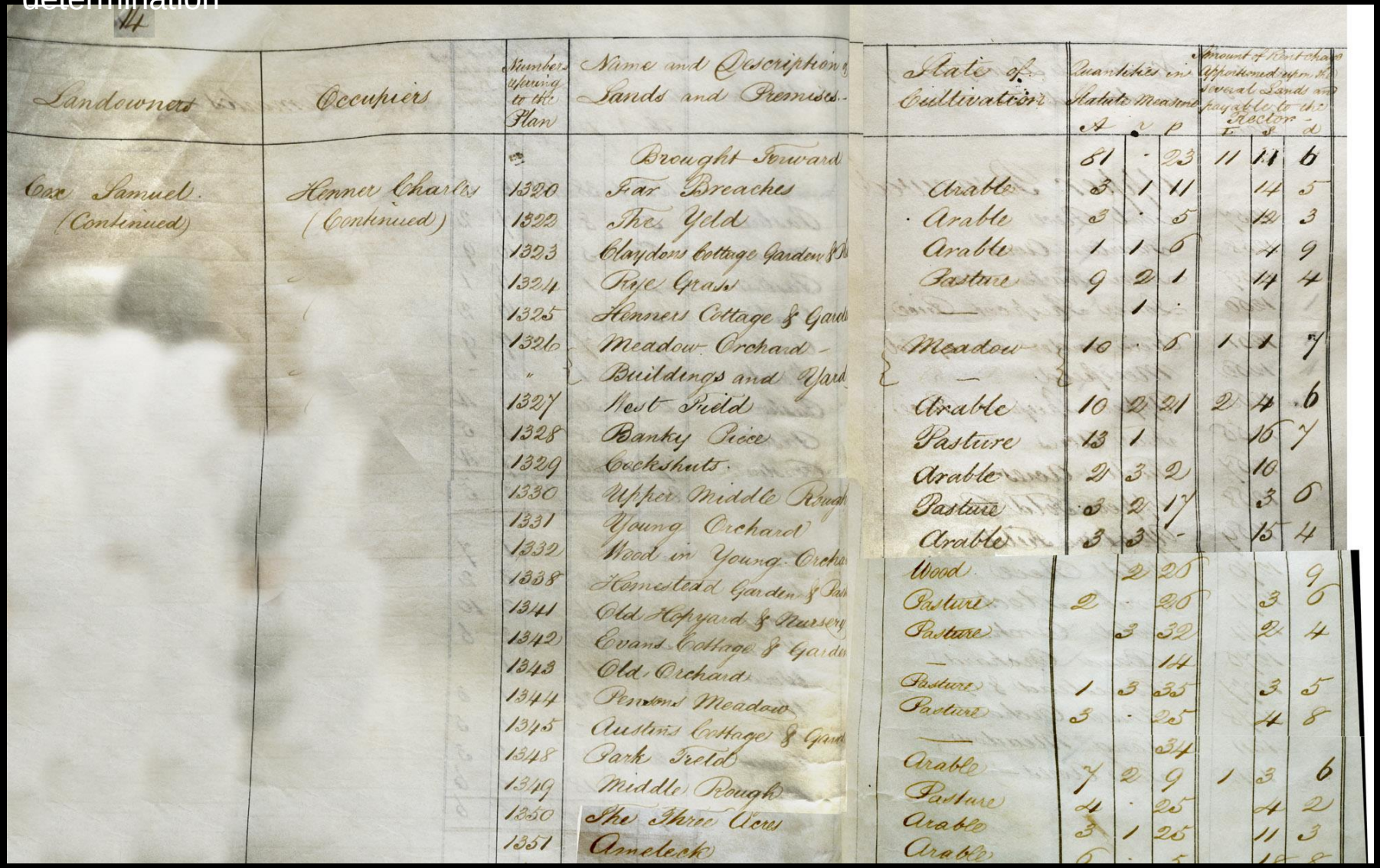
25” to mile
OS 1885 1st Ed

Tithe map
1840

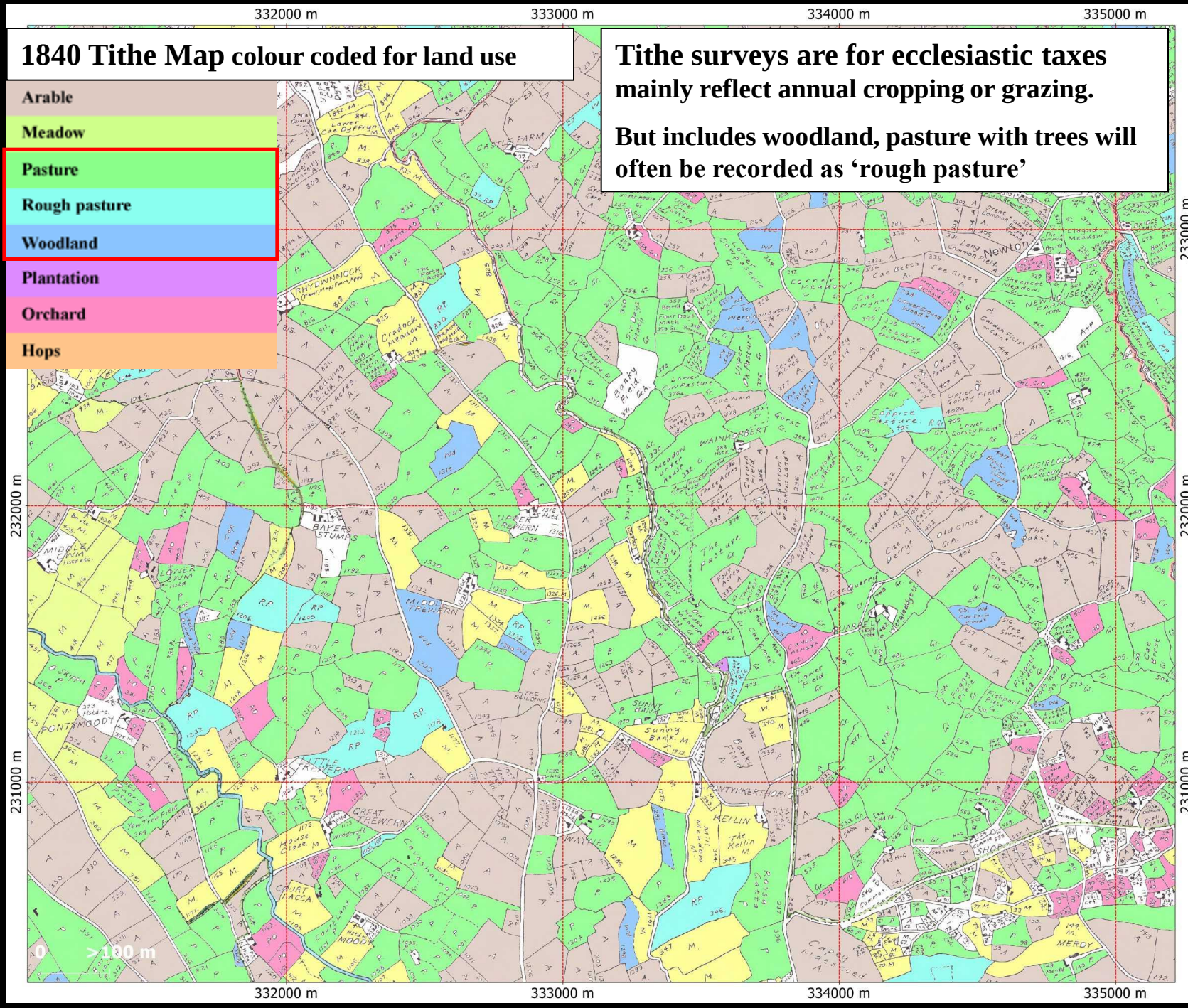
OS 1:25,000

Tithe surveys result of the Tithe Commutation Act 1836.

Include the map of land & property parcels but also separate document ‘apportionment’ schedule with owner, tenant, field name, ‘state of cultivation’, area of each, tithe tax determination

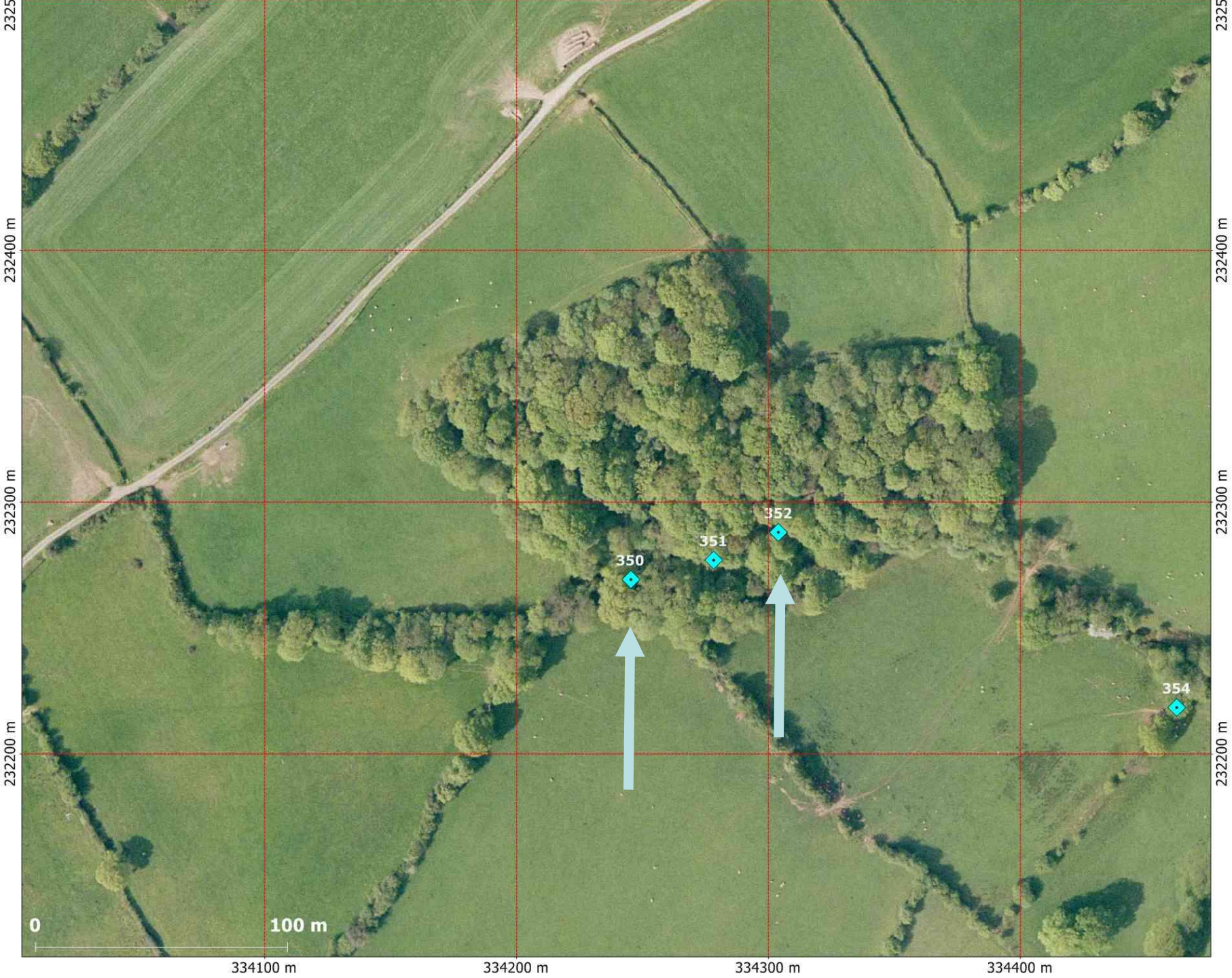


Landowners	Occupiers	Numbers referring to the Plan	Name and Description of Lands and Premises	State of Cultivation	Quantities in Statute Measure A	r	p	Amount of Rent charge Apportioned upon the several Lands and payable to the Rector £	s	d
			Brought Forward		81	.	23	11	11	6
Cox Samuel. (Continued)	Henner Charles (Continued)	1320	Far Breaches	Arable	3	1	11		14	5
		1322	The Yeld	Arable	3	.	5		12	3
		1323	Claydons Cottage Garden &	Arable	1	1	6		4	9
		1324	Rye Grass	Pasture	9	2	1		14	4
		1325	Henners Cottage & Gard	—		1	.			
		1326	Meadow Orchard	Meadow	10	.	5	1	1	7
		"	Buildings and Yard	—						
		1327	West Field	Arable	10	2	21	2	4	6
		1328	Banky Piece	Pasture	13	1			16	7
		1329	Cockshuts	Arable	2	3	2		10	
		1330	Upper Middle Rough	Pasture	3	2	17		3	6
		1331	Young Orchard	Arable	3	3	.		15	4
		1332	Wood in Young Orcha	Wood		2	25			9
		1338	Homestead Garden & Pas	Pasture	2	.	20		3	6
		1341	Old Hopyard & Nursery	Pasture		3	32		2	4
		1342	Evans Cottage & Garde	—			14			
		1343	Old Orchard	Pasture	1	3	35		3	5
		1344	Pennams Meadow	Pasture	3	.	25		4	8
		1345	Austins Cottage & Gard	—			34			
		1348	Park Field	Arable	7	2	9	1	3	6
		1349	Middle Rough	Pasture	4	.	25		4	2
		1350	The Three Acres	Arable	3	1	25		11	3
		1351	Ameleach	Arable	6	.	5		18	8


332000 m
333000 m
334000 m
335000 m
233000 m
232000 m
231000 m
1840 Tithe Map colour coded for land use
Arable
Meadow
Pasture
Rough pasture
Woodland
Plantation
Orchard
Hops
Tithe surveys are for ecclesiastic taxes
mainly reflect annual cropping or grazing.
But includes woodland, pasture with trees will often be recorded as 'rough pasture'
0
>100 m

332000 m
333000 m
334000 m
335000 m
233000 m
232000 m
231000 m
Tithe map “woodland”
Tithe map “rough pasture”
0
>100 m

Nine Acre
A
406
Coppice
Field
A
Past
A
407
Gr.
Upper
Gorst
408a
Coppice
Pasture.
R.Gr.
409
405
352
351
350
404
Gr.
Low
Gorst
Waingvi
403
451
354
Pool
Field
A
0
>10 m
232400 m
232300 m
232200 m
334100 m
334200 m
334300 m
334400 m


352
351
350
354
0
100 m
334100 m
334200 m
334300 m
334400 m
232400 m
232300 m
232200 m

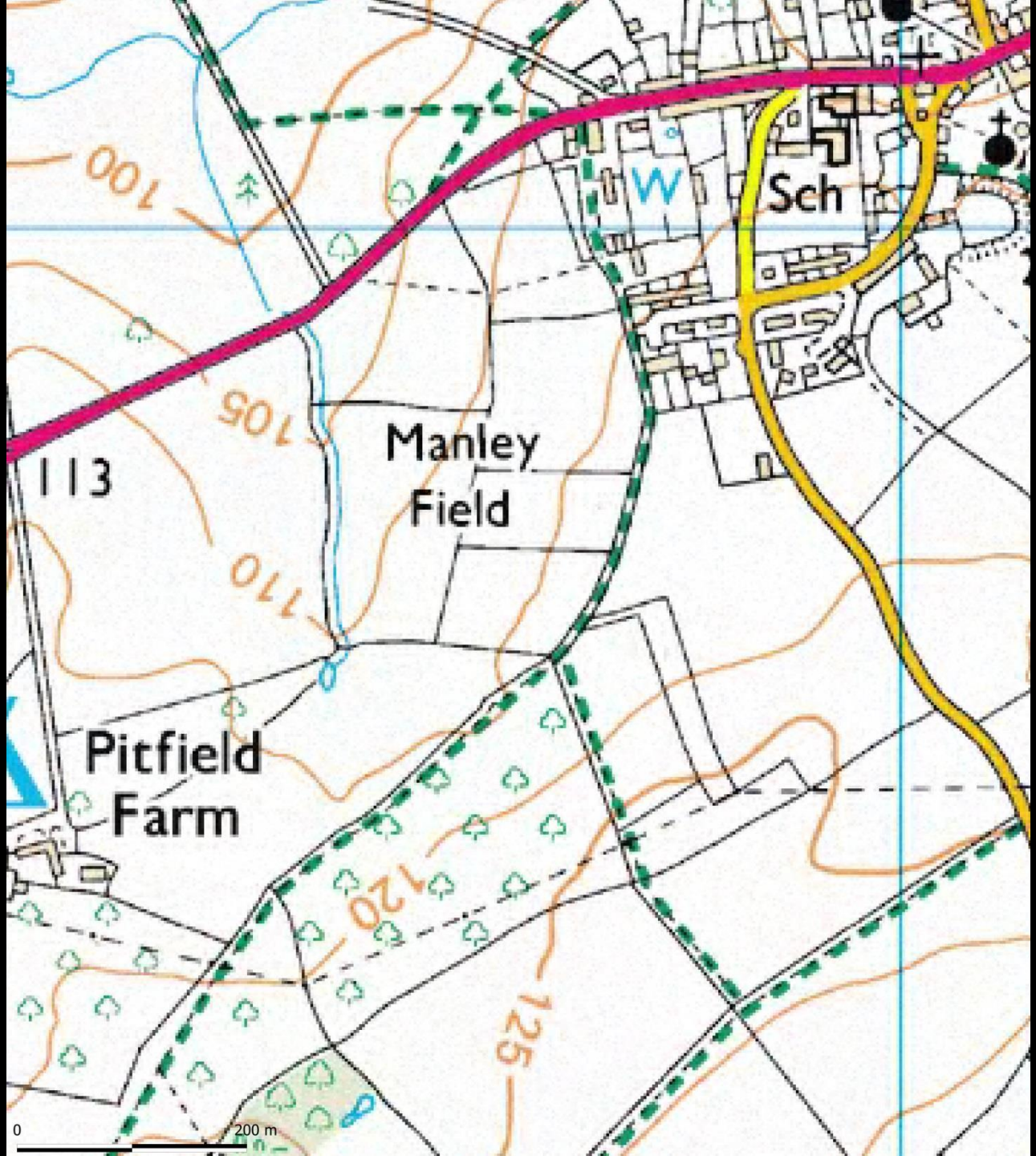
waypoint 350

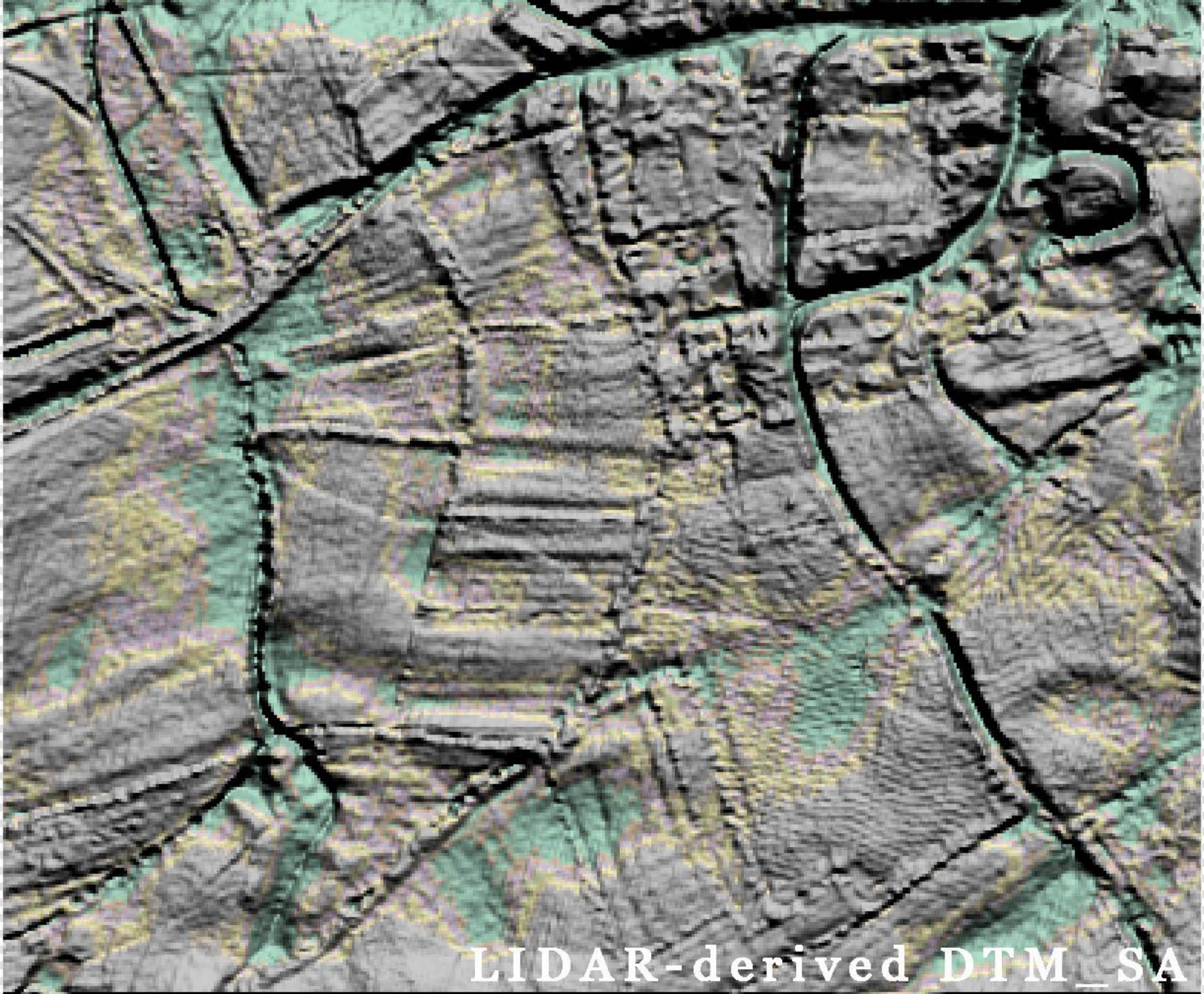
Tilia
waypoint 352

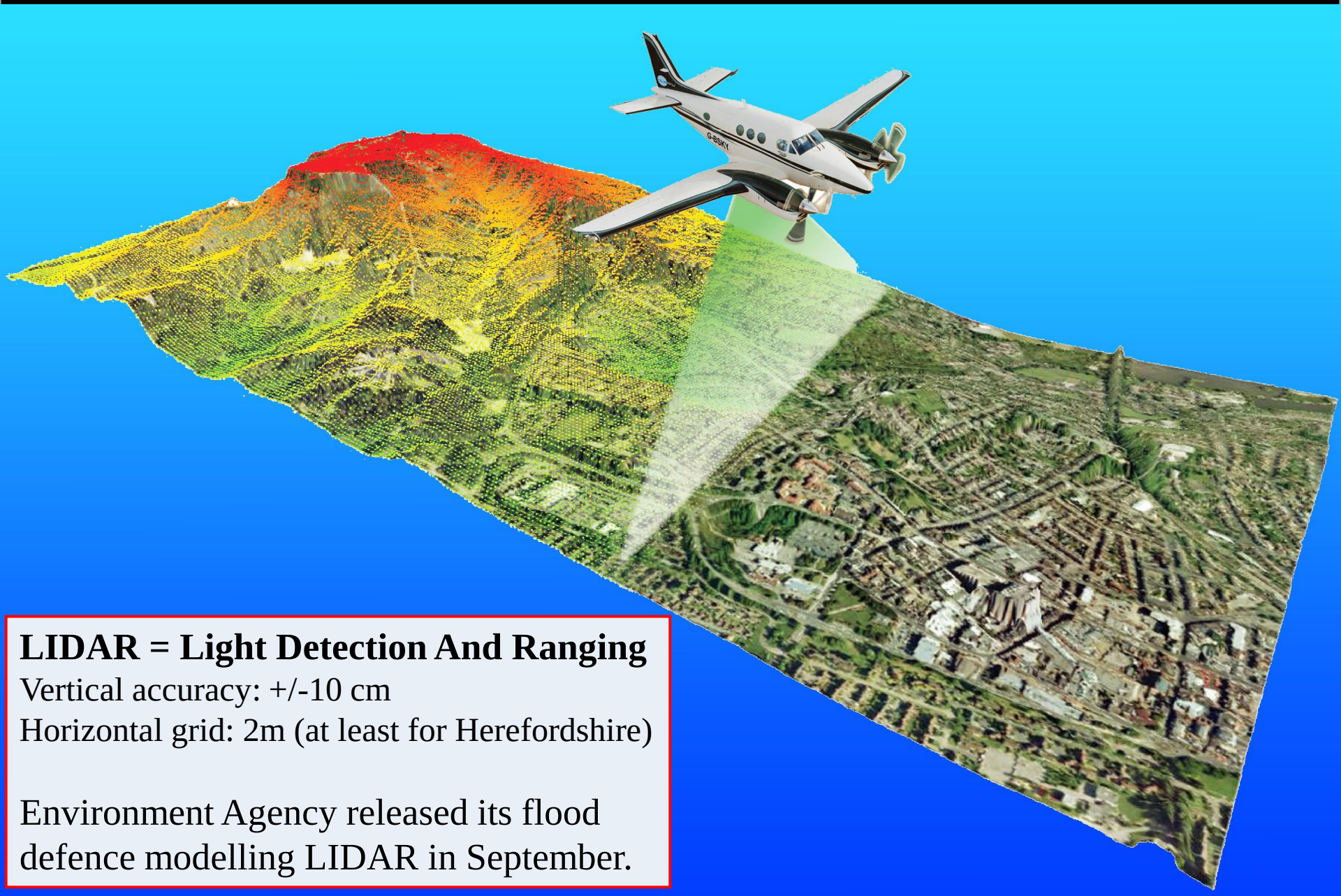
Pembridge parish boundary NW central Herefordshire

Now switch to live QGIS for its 1840 tithe map survey if possible (!)

CHURCH
PITFIELD
0
200 m


100
105
110
120
125
W
Sch
113
Manley
Field
Pitfield
Farm
0
200 m

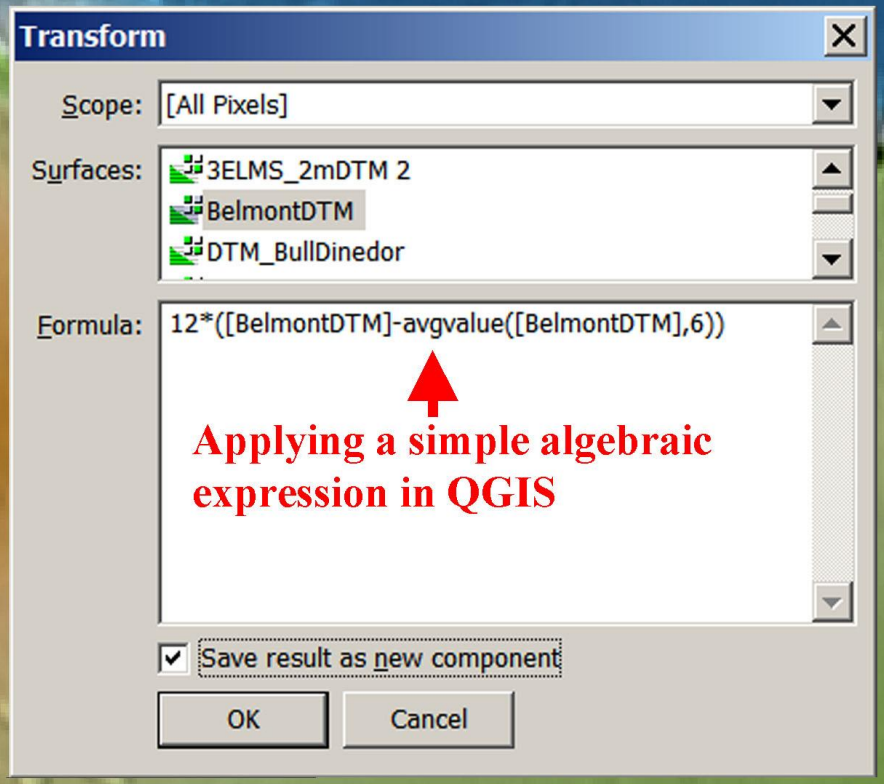

LIDAR-derived DTM_SA



LIDAR = Light Detection And Ranging
Vertical accuracy: +/-10 cm
Horizontal grid: 2m (at least for Herefordshire)

Environment Agency released its flood defence modelling LIDAR in September.

Enhancing LIDAR terrain features
by extracting and amplifying slope variations



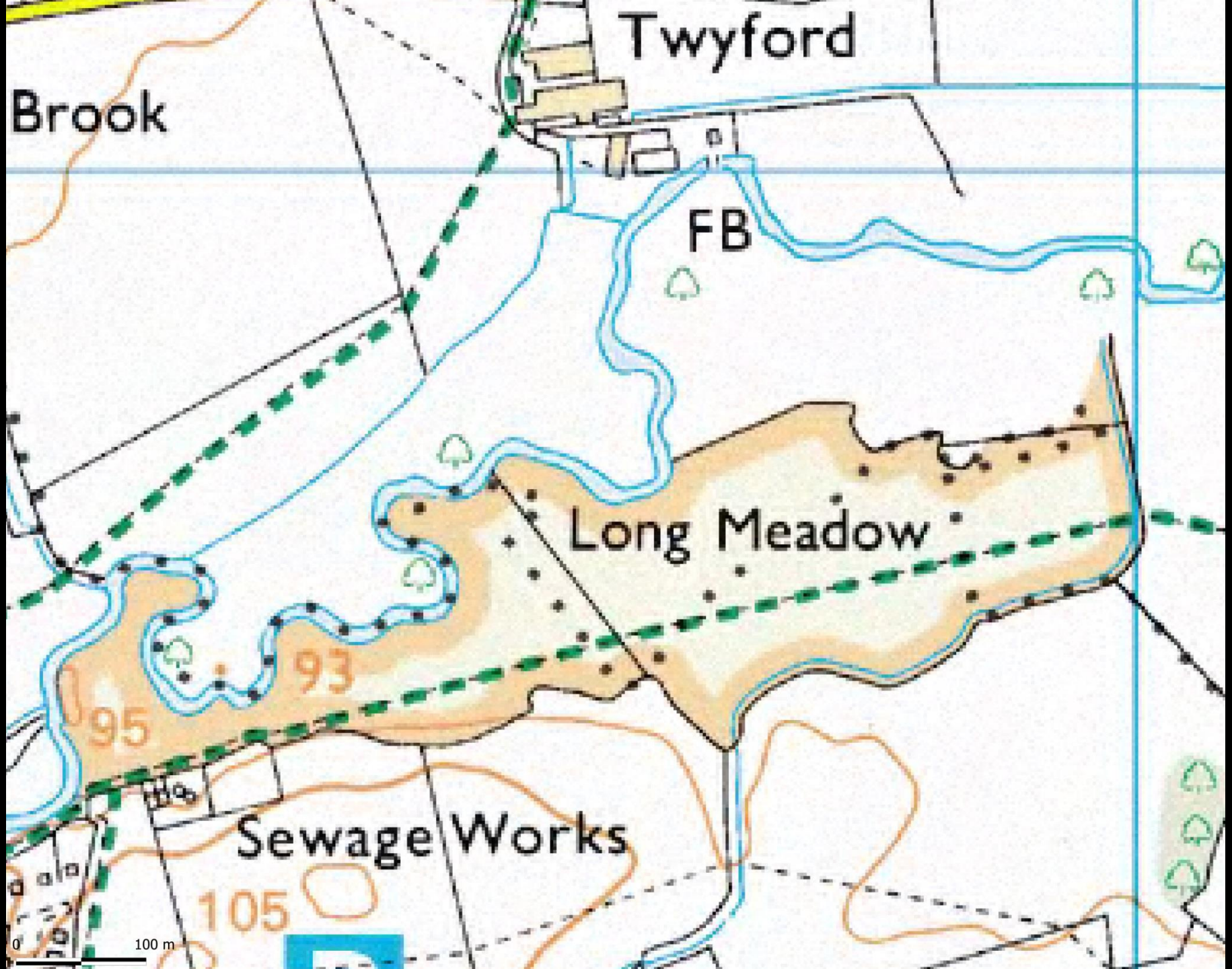
To reveal subtle archaeological features, freely available GOV raw LIDAR DTM files require some arithmetic coding processing

https://environment.data.gov.uk/DefraDataDownload/

0 100 m

347600 m 347700 m 347800 m 347900 m 348000 m 348100 m 348200 m 348300 m

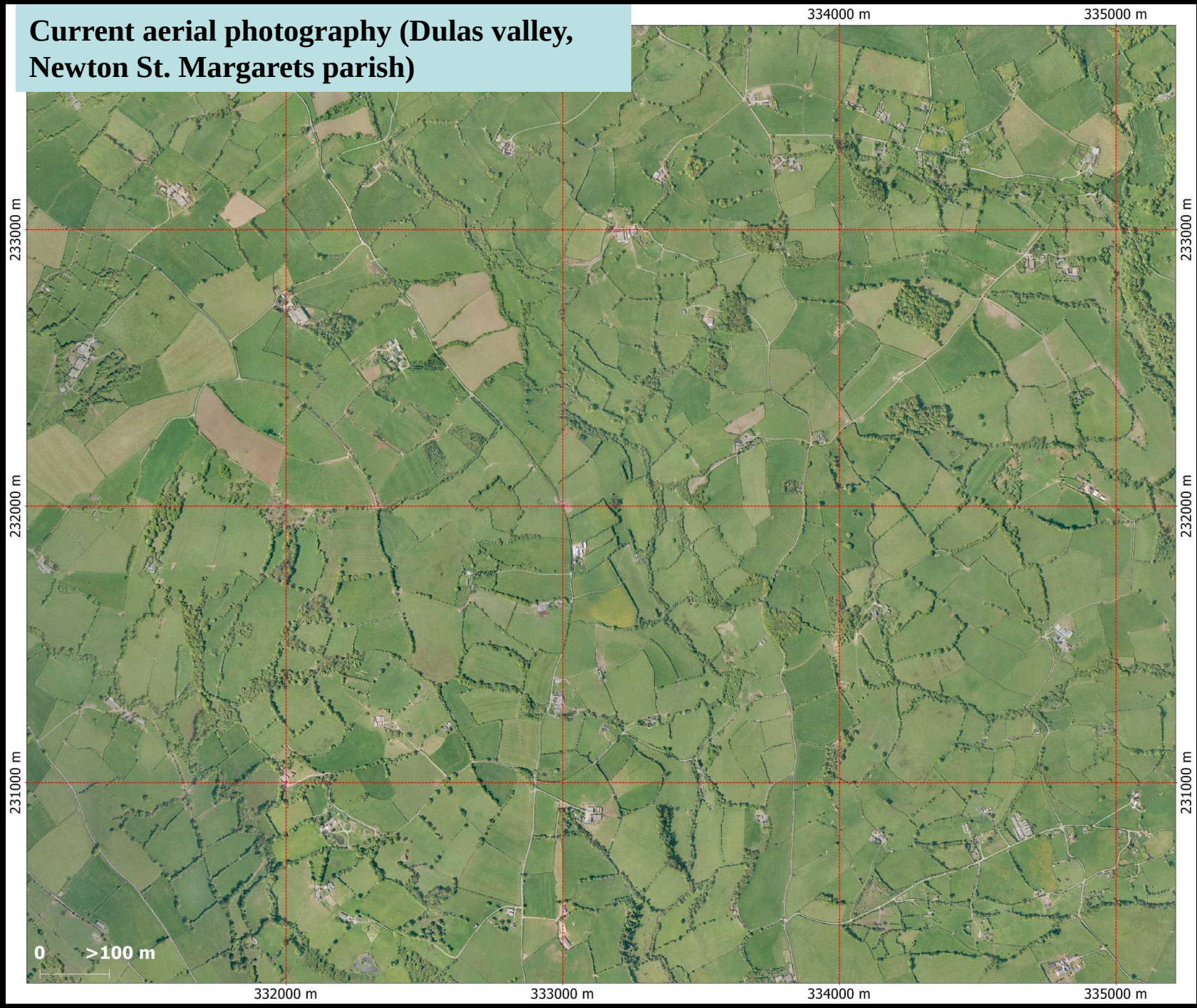
238900 m 238800 m 238700 m 238600 m 238500 m 238400 m 238300 m


Twyford
Brook
FB
Long Meadow
93
95
Sewage Works
105
0
100 m

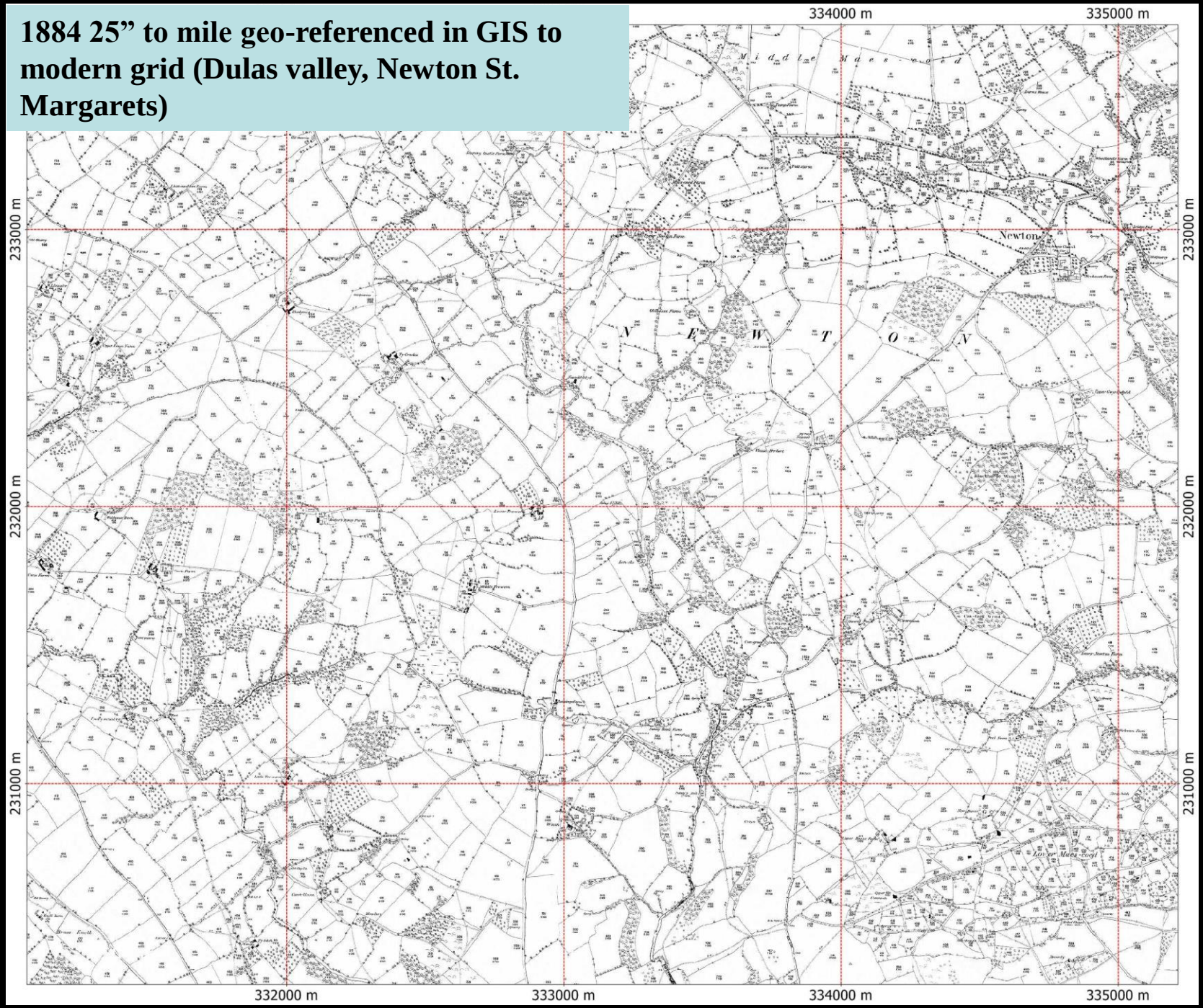
0
100 m

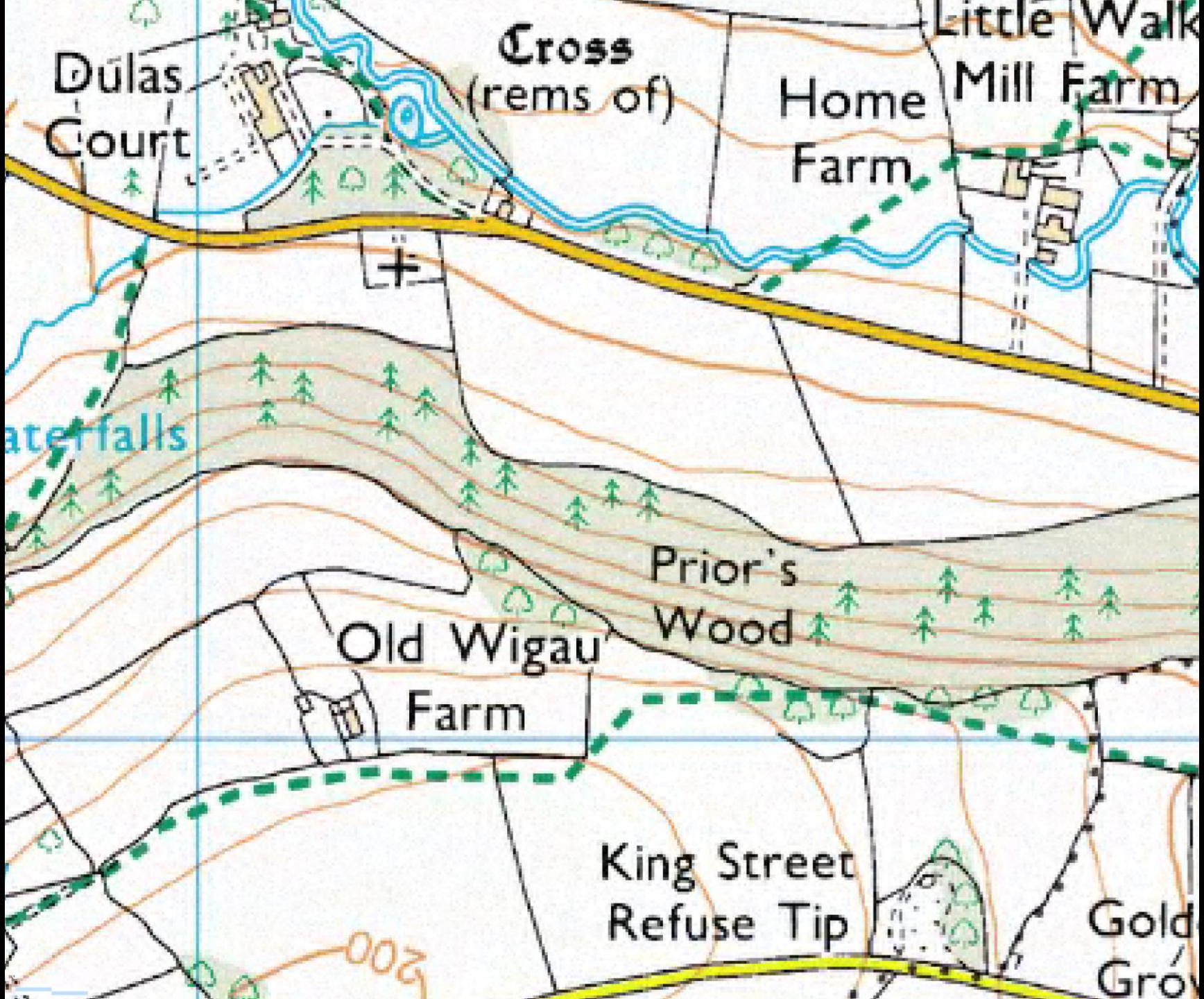
0
100 m

Current aerial photography (Dulas valley, Newton St. Margarets parish)

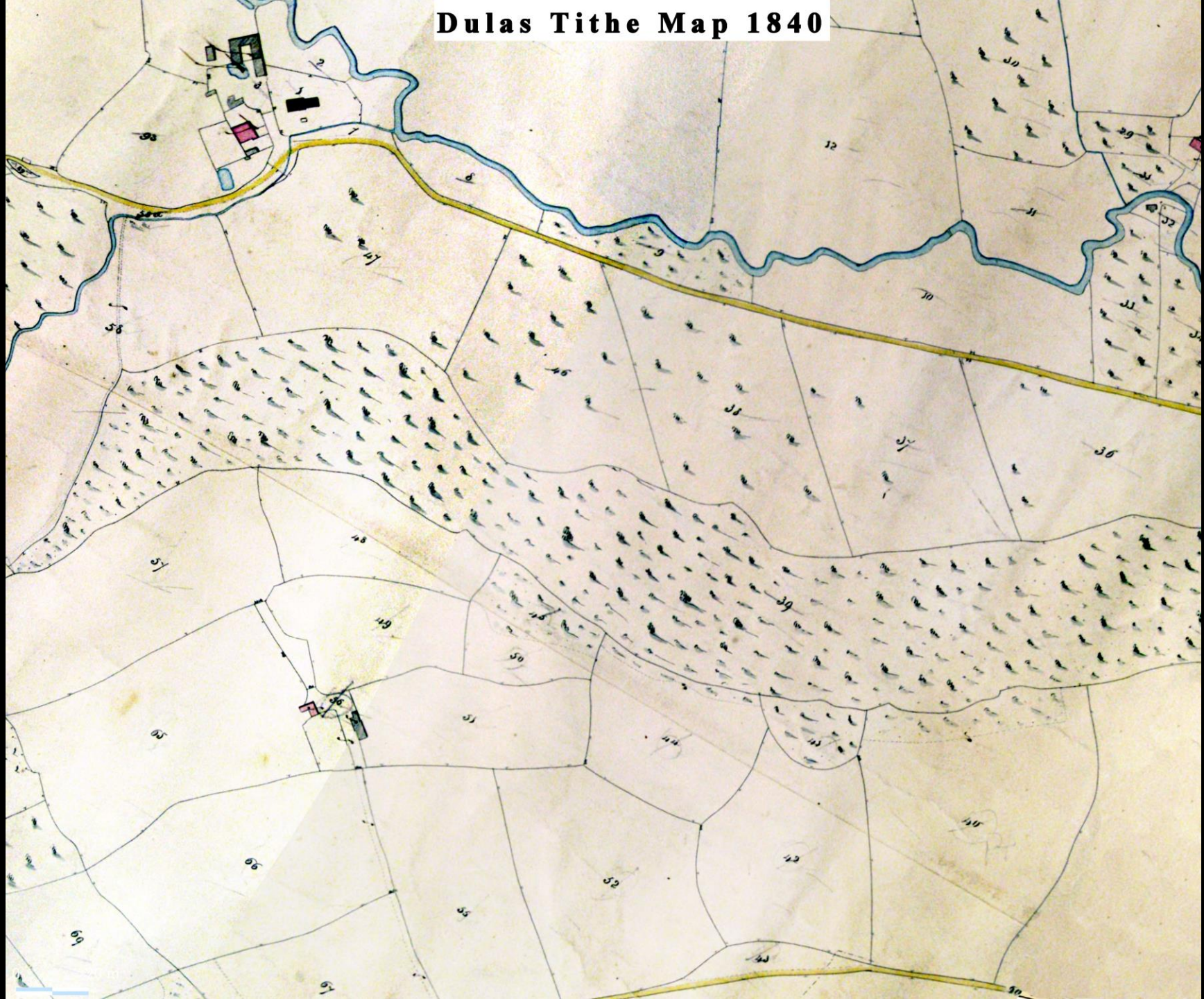


1884 25” to mile geo-referenced in GIS to modern grid (Dulas valley, Newton St. Margarets)



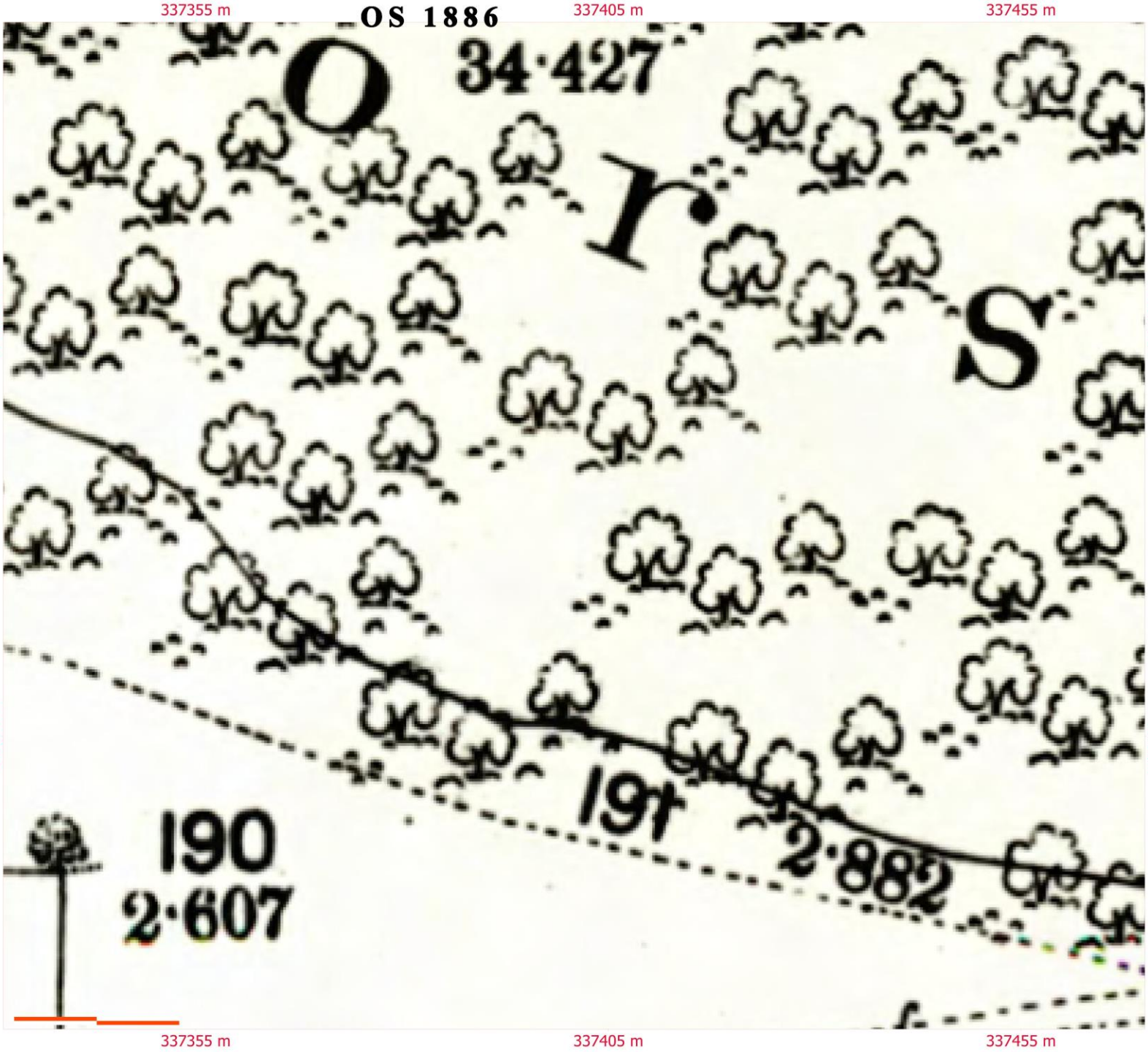

Dulas Court
Cross (rems of)
Home Farm
Little Walk
Mill Farm
aterfalls
Prior's Wood
Old Wigau Farm
King Street Refuse Tip
200

Dulas Tithe Map 1840

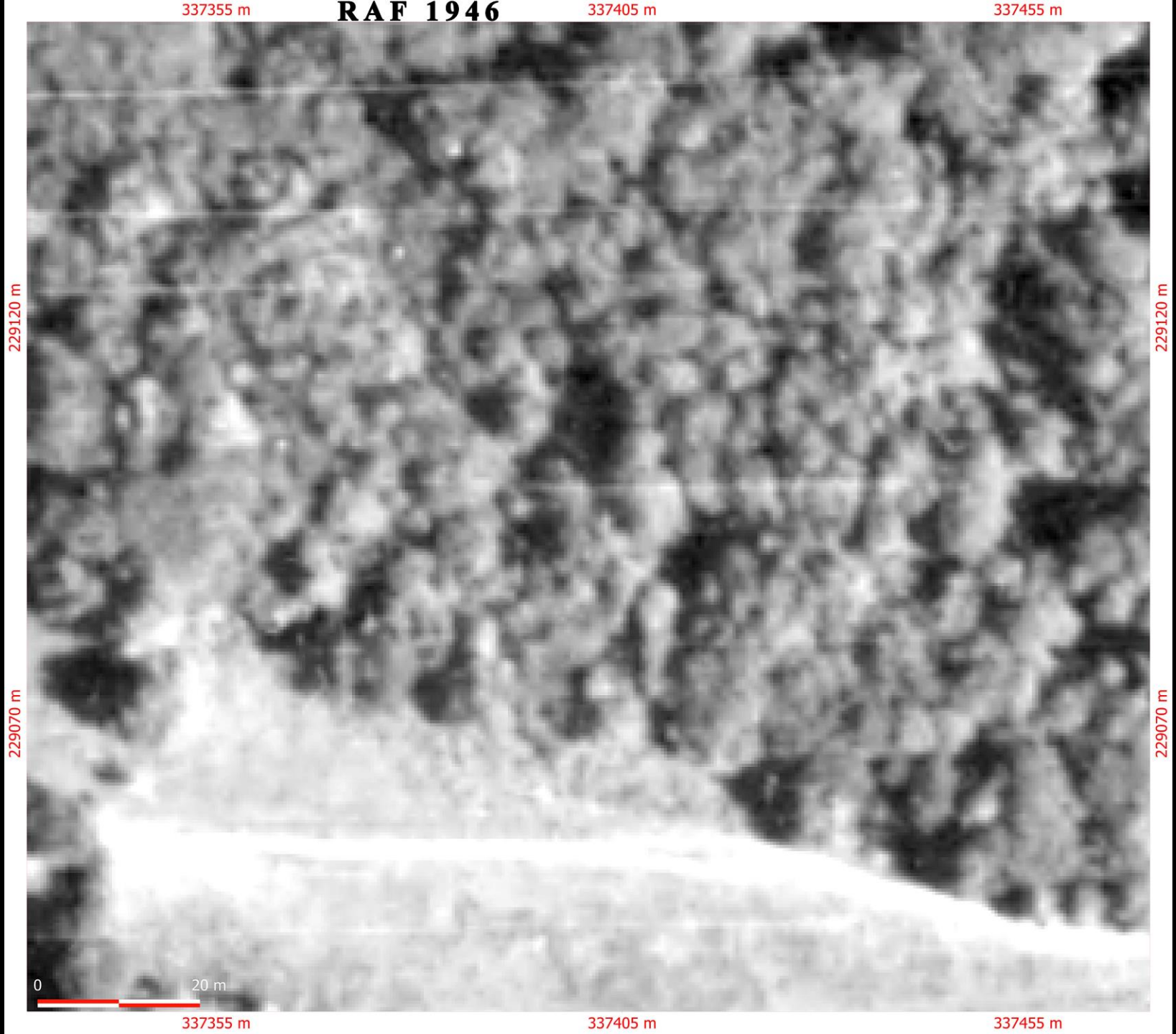


RAF AP July 1946
0
>20 m

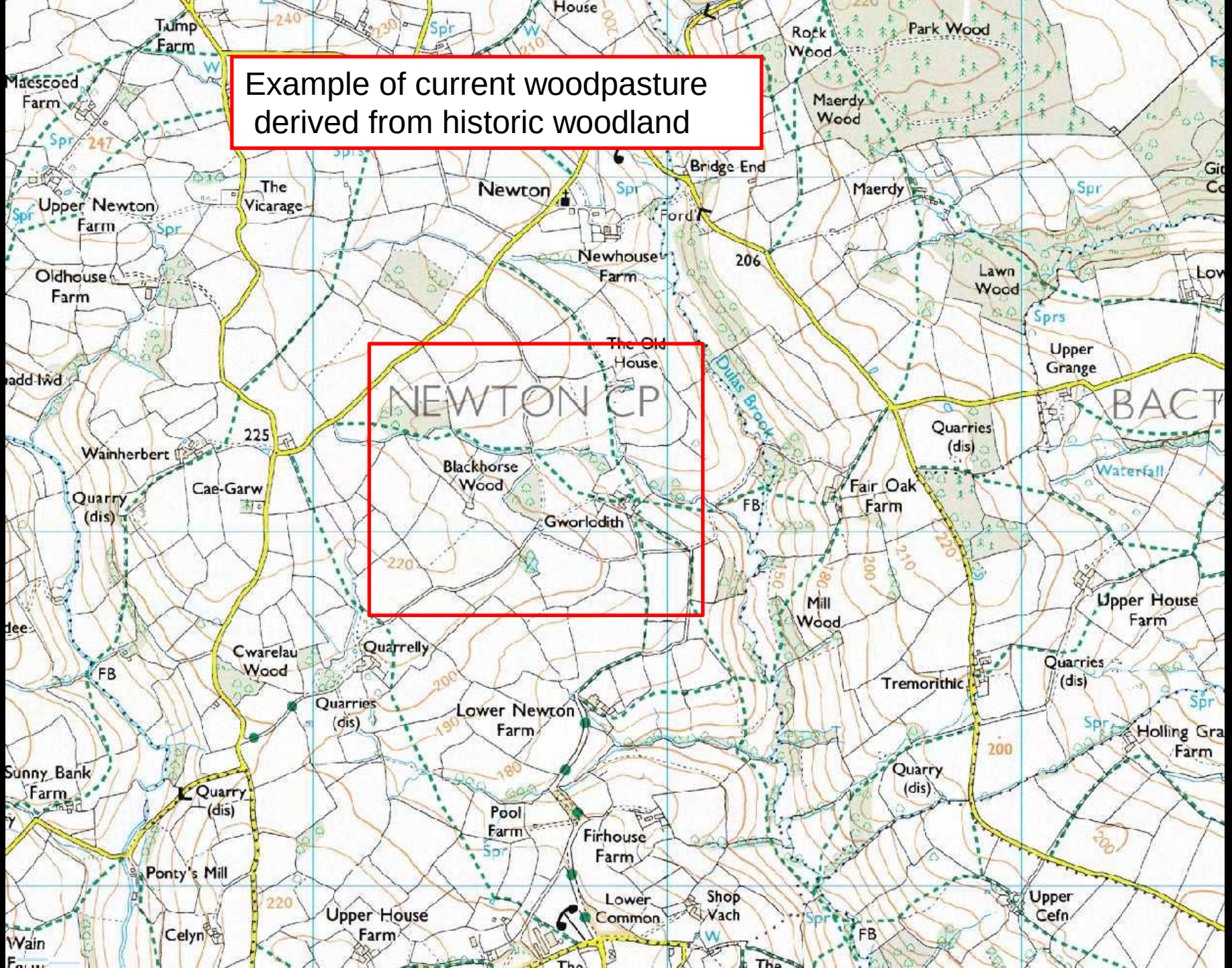
AP 2000
0
>20 m


337355 m
OS 1886
337405 m
337455 m
229120 m
229120 m
O
34·427
r
S
191
2·882
190
2·607
229070 m
229070 m
337355 m
337405 m
337455 m

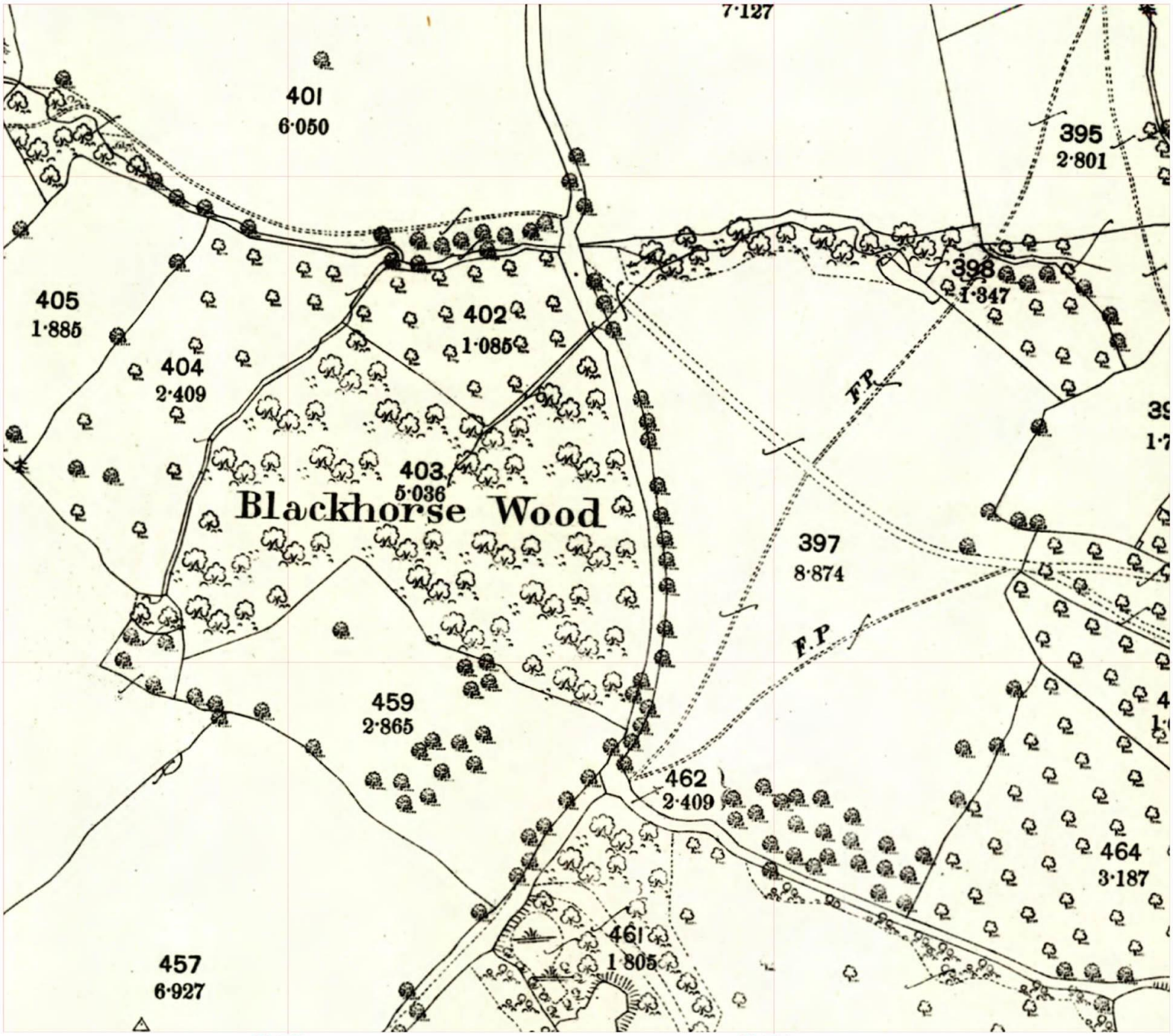
RAF 1946

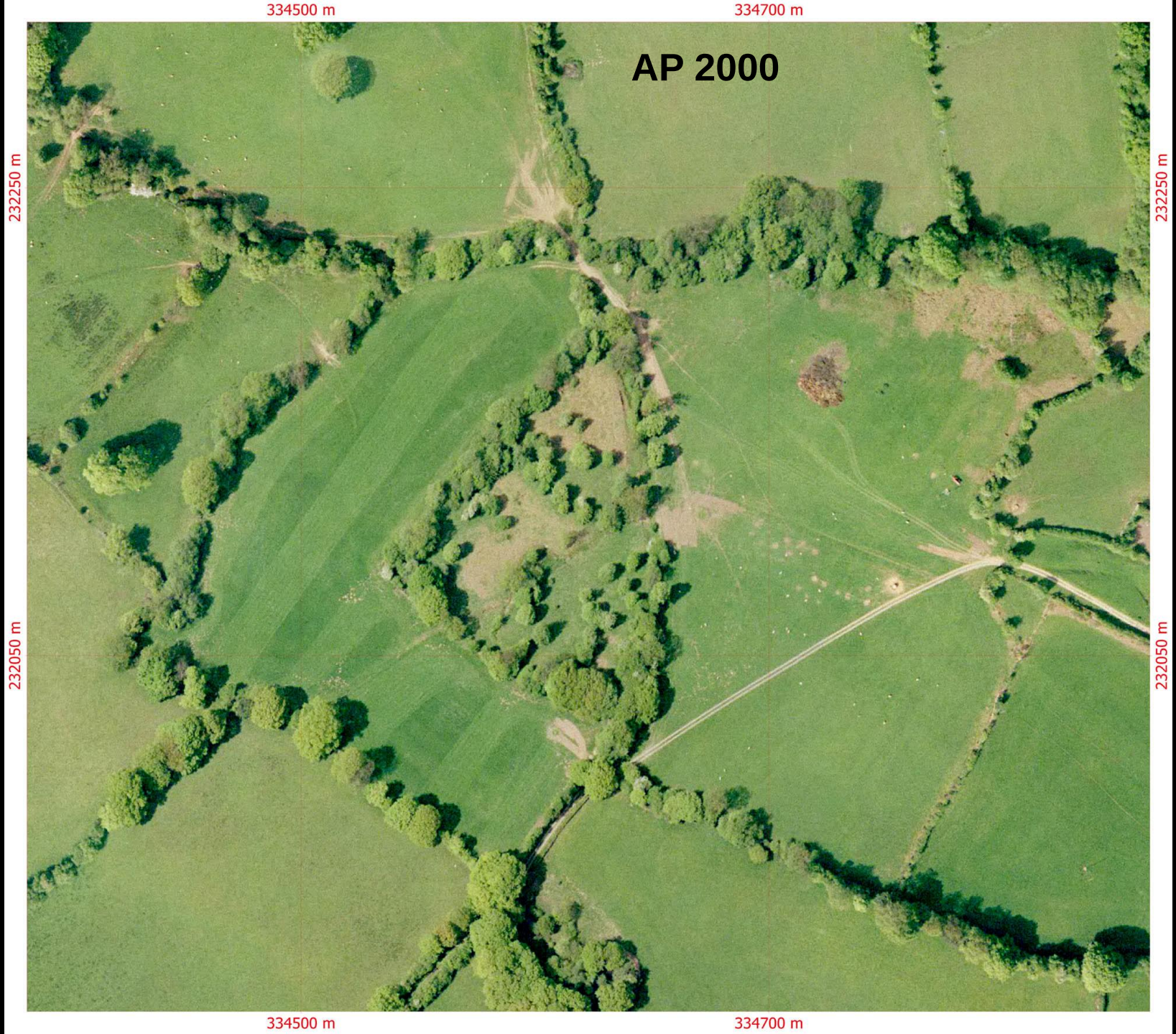


337355 m
337405 m
337455 m
AP 2000
229120 m
229070 m
0
20 m

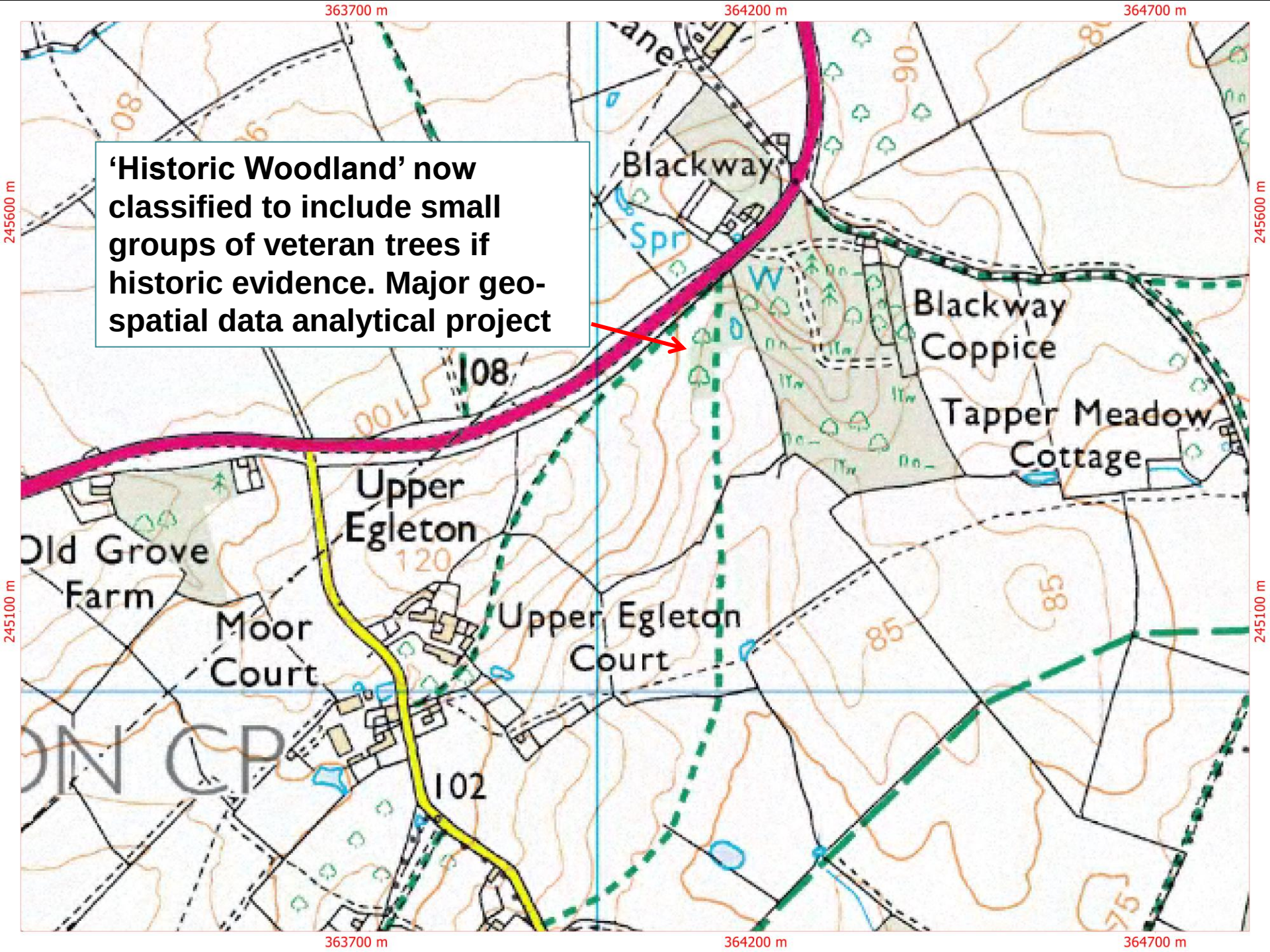

Example of current woodpasture derived from historic woodland
NEWTON CP
Newton
Newhouse Farm
Bridge End
Maerdy
Maerdy Wood
Park Wood
Rock Wood
Tump Farm
Maescoed Farm
Upper Newton Farm
The Vicarage
Oldhouse Farm
The Old House
Dulas Brook
Lawn Wood
Upper Grange
Quarries (dis)
Waterfall
Fair Oak Farm
Blackhorse Wood
Gworlodith
Wainherbert
Cae-Garw
Quarry (dis)
Mill Wood
Upper House Farm
Cwarelau Wood
Quarrelly
Quarries (dis)
Lower Newton Farm
Tremorithic
Holling Gra Farm
Sunny Bank Farm
Quarry (dis)
Pool Farm
Firhouse Farm
Ponty's Mill
Upper House Farm
Lower Common
Shop Vach
Upper Cefn
Celyn
Wain
FB
Spr
Sprs
206
225
220
200
190
180
210
150

334500 m
334700 m
232250 m
232050 m
409.
Lower
Gorsty Field
Gr.
A.
423.
410.
Gr.
Gr.
447.
Black-
horse
Wood
Wd.
450.
Cae Pwll
GWEIRLODY
or
GWORLODY
Hstd
442
444
A.
Gr.
448.
A.
456.
Gr.
446
A.
445.
Wd.
493.
d close
The

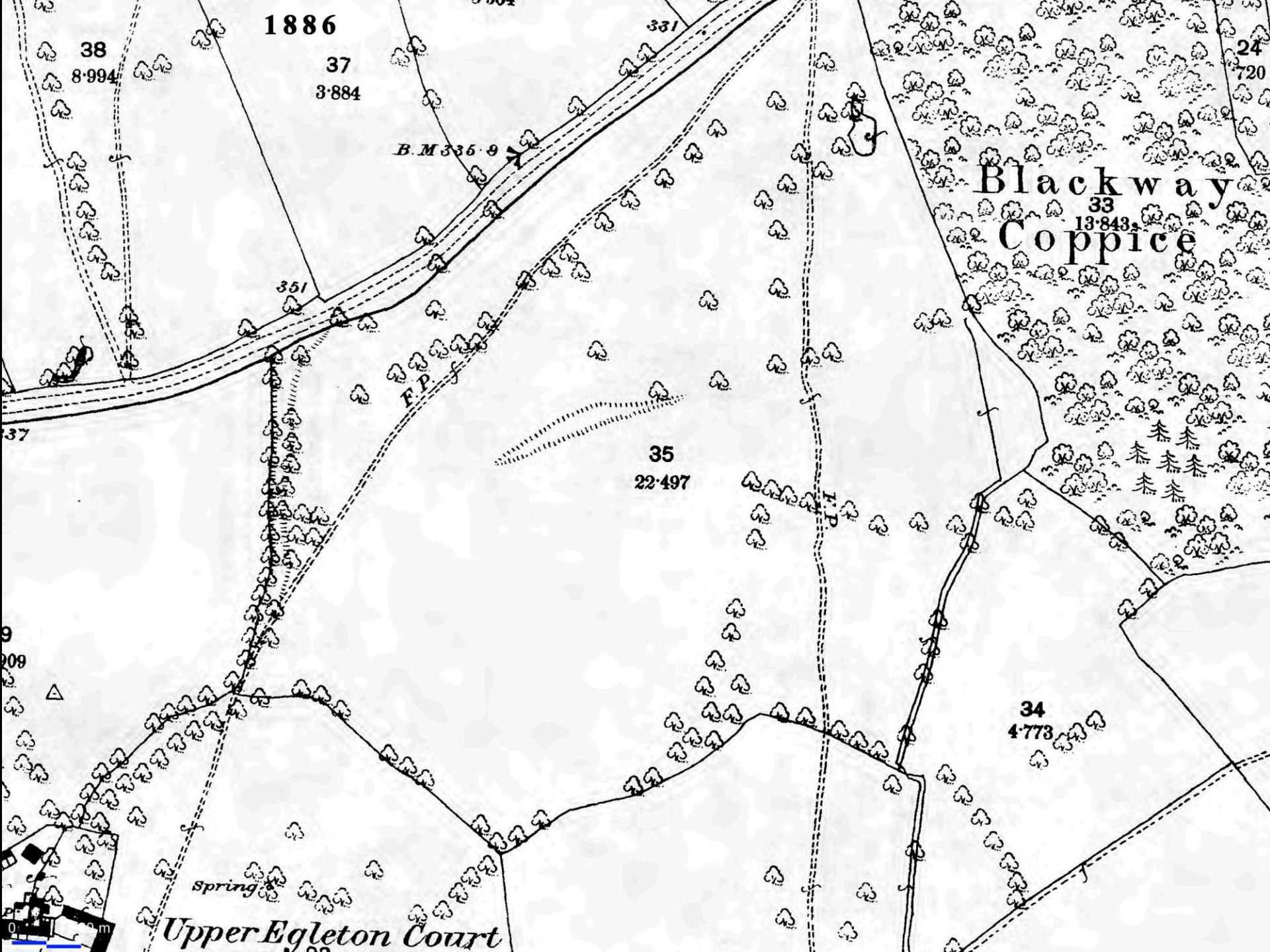

334500 m
334700 m
232250 m
232050 m
401
6·050
7·127
395
2·801
398
1·347
405
1·885
402
1·085
404
2·409
403
5·036
Blackhorse Wood
F.P.
397
8·874
459
2·865
462
2·409
464
3·187
461
1·805
457
6·927


AP 2000
334500 m
334700 m
232250 m
232050 m

334500 m
334700 m
232250 m
232050 m
APGB April 2021

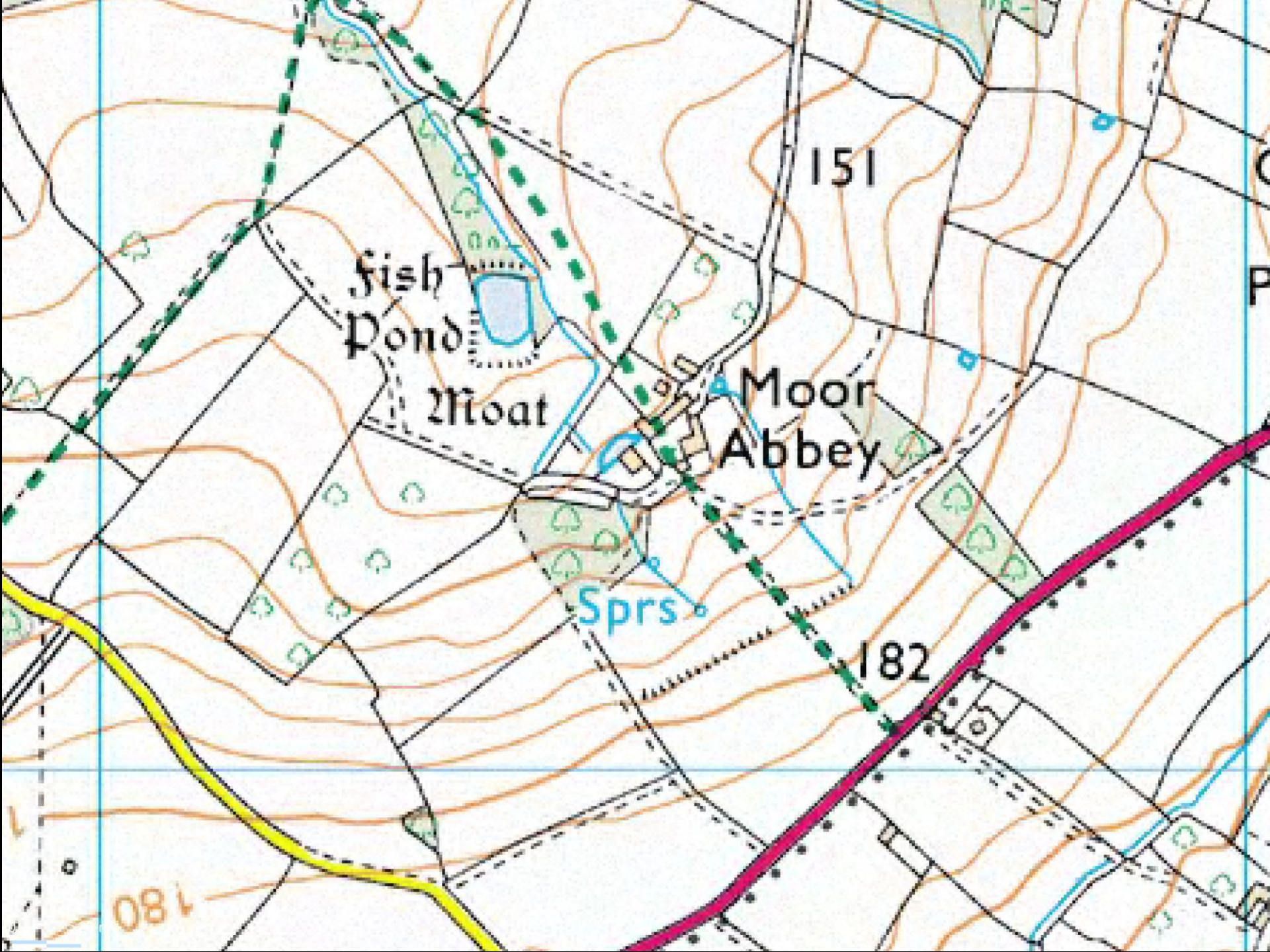

363700 m
364200 m
364700 m
245600 m
245100 m
‘Historic Woodland’ now classified to include small groups of veteran trees if historic evidence. Major geo-spatial data analytical project
Blackway
Blackway Coppice
Tapper Meadow Cottage
108
Upper Egleton
Old Grove Farm
Moor Court
Upper Egleton Court
102
120
100
90
85
75

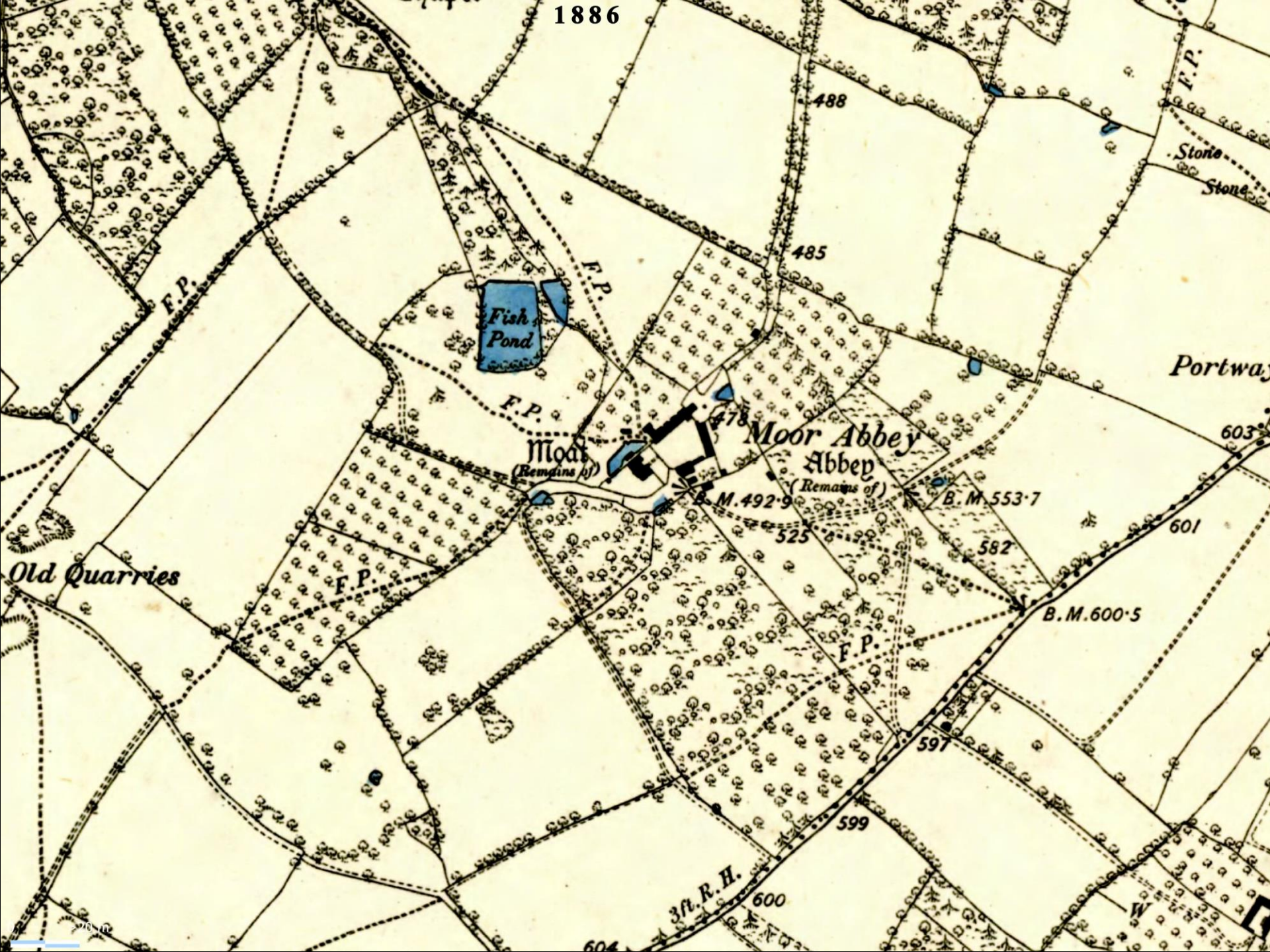
‘New’ wood pasture
site at Eggleton


1886
38
8·994
37
3·884
B.M 335·9
331
351
F.P.
35
22·497
Blackway
Coppice
33
13·843
24
720
34
4·773
Spring
Upper Egleton Court

APGB April 2021

0
20 m


151
Fish
Pond
Moat
Moor
Abbey
Sprs
182
180


1886
488
Stone
Stone
485
F.P.
F.P.
F.P.
Fish Pond
F.P.
478
Moor Abbey
Abbey
(Remains of)
Moat
(Remains of)
B.M.492·9
B.M.553·7
525
582
603
601
Old Quarries
F.P.
B.M.600·5
F.P.
597
599
3/ft. R.H.
600
W

APGB April 2021
0
>20 m

0
20 m

Time lapse geo-referenced aerial photography to display recent stress in veteran oaks.

The case of Moccas Park NNR

Moccas Park central area 2021
334150 m
334250 m
334350 m
334450 m
334550 m
242750 m
242650 m
242550 m
242450 m

334300 m
334350 m
334400 m
2021
0
10 m
242600 m
242600 m
334300 m
334350 m
334400 m
42550 m

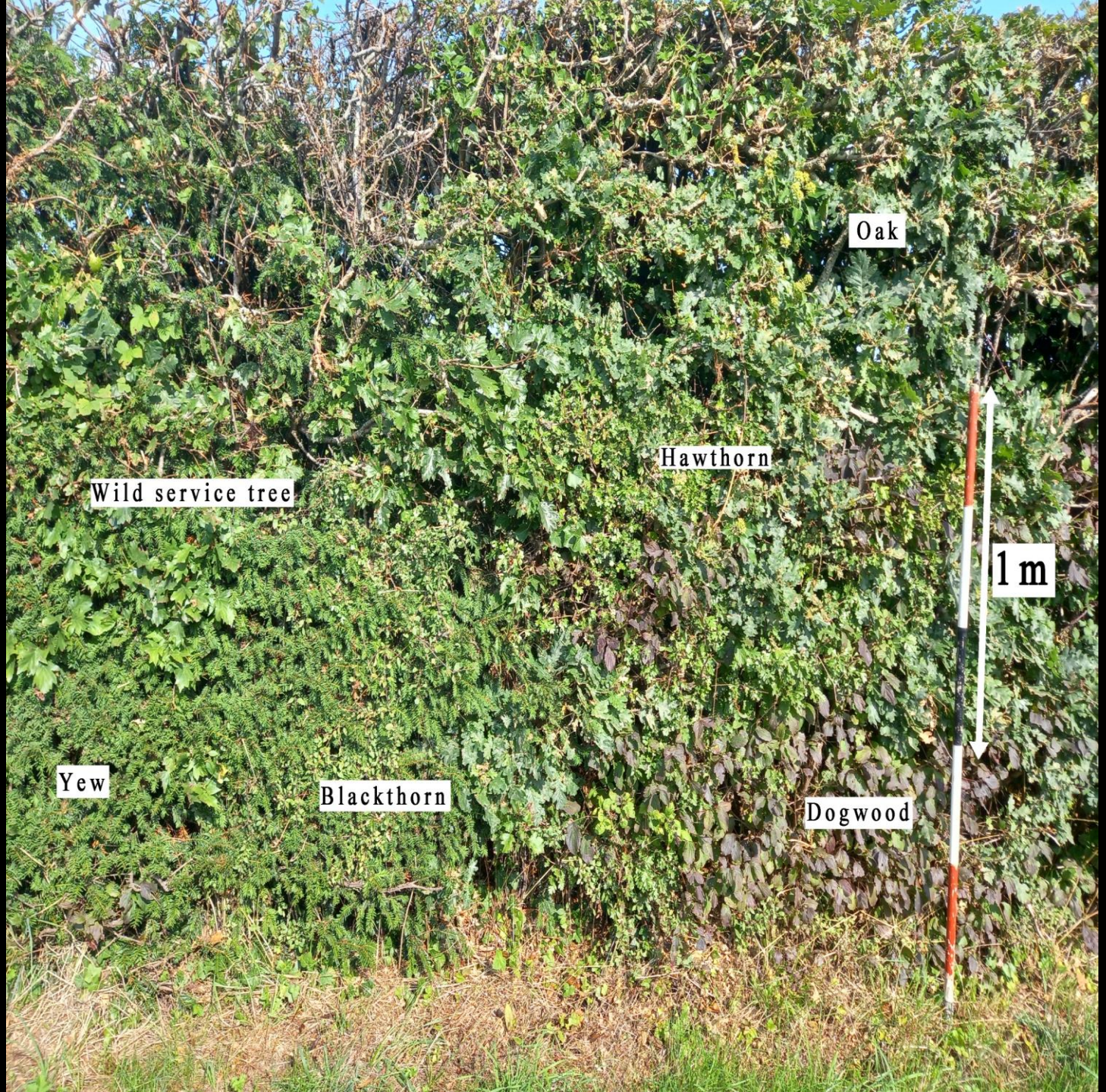
Colwall hedgerow survey using ‘geo-tagged’ mobile phone photos

Lenovo
Ultrabook
CORE i7

20220601_102856.jpg Properties

General | Security | Details | Previous Versions

Property	Value
EXIF version	0220
GPS	
Latitude	52; 7; 52.329700000002042
Longitude	2; 55; 48.0431999999999
Altitude	126
File	
Name	20220601_102856.jpg
Item type	JPG File
Folder path	C:\Geoserver2020\QGIS\QGISes...
Date created	02/06/2022 07:47
Date modified	02/06/2022 09:16
Size	1.63 MB

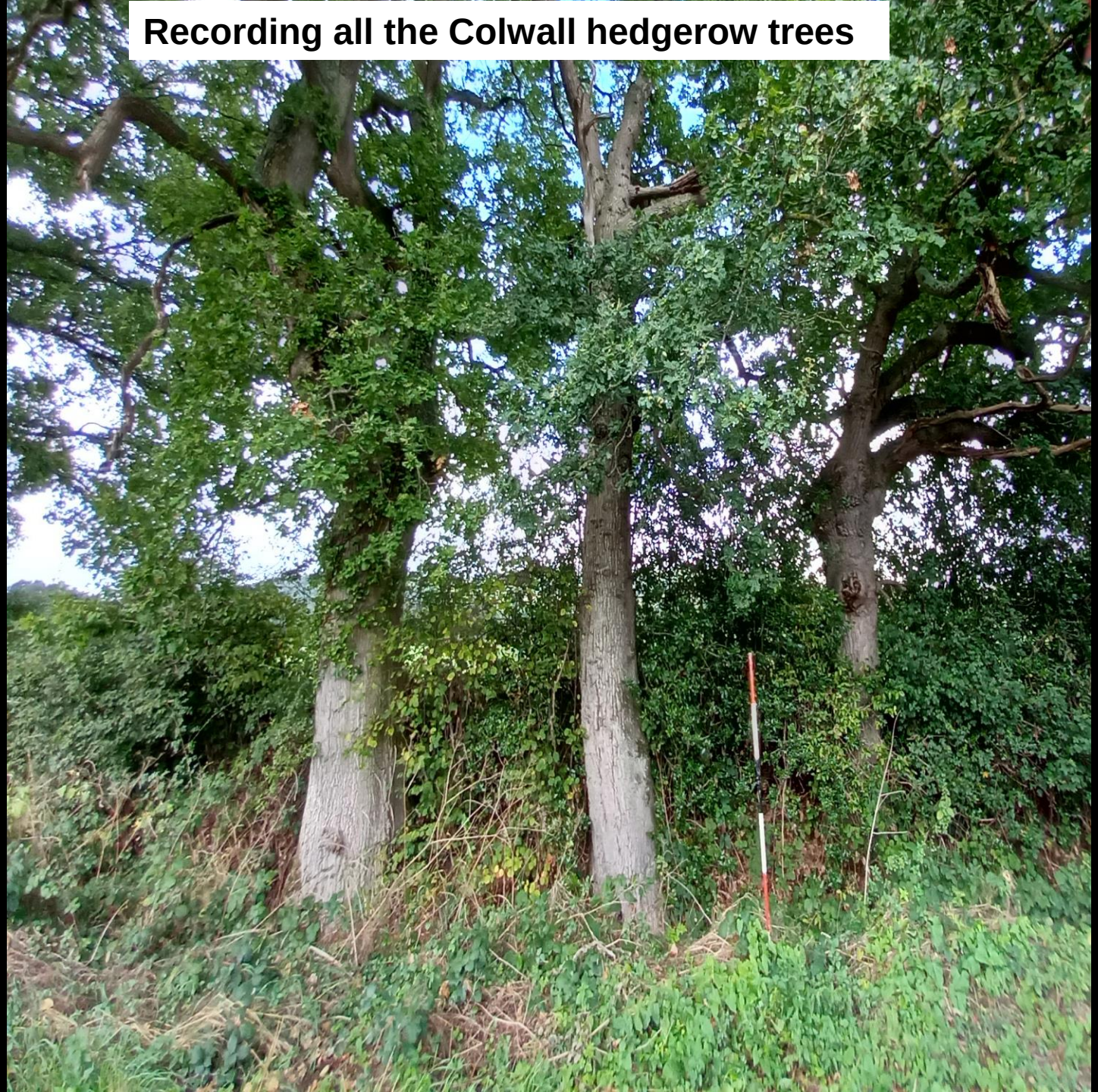

Oak
Hawthorn
Wild service tree
1 m
Yew
Blackthorn
Dogwood

Mobile photo macro setting for close up

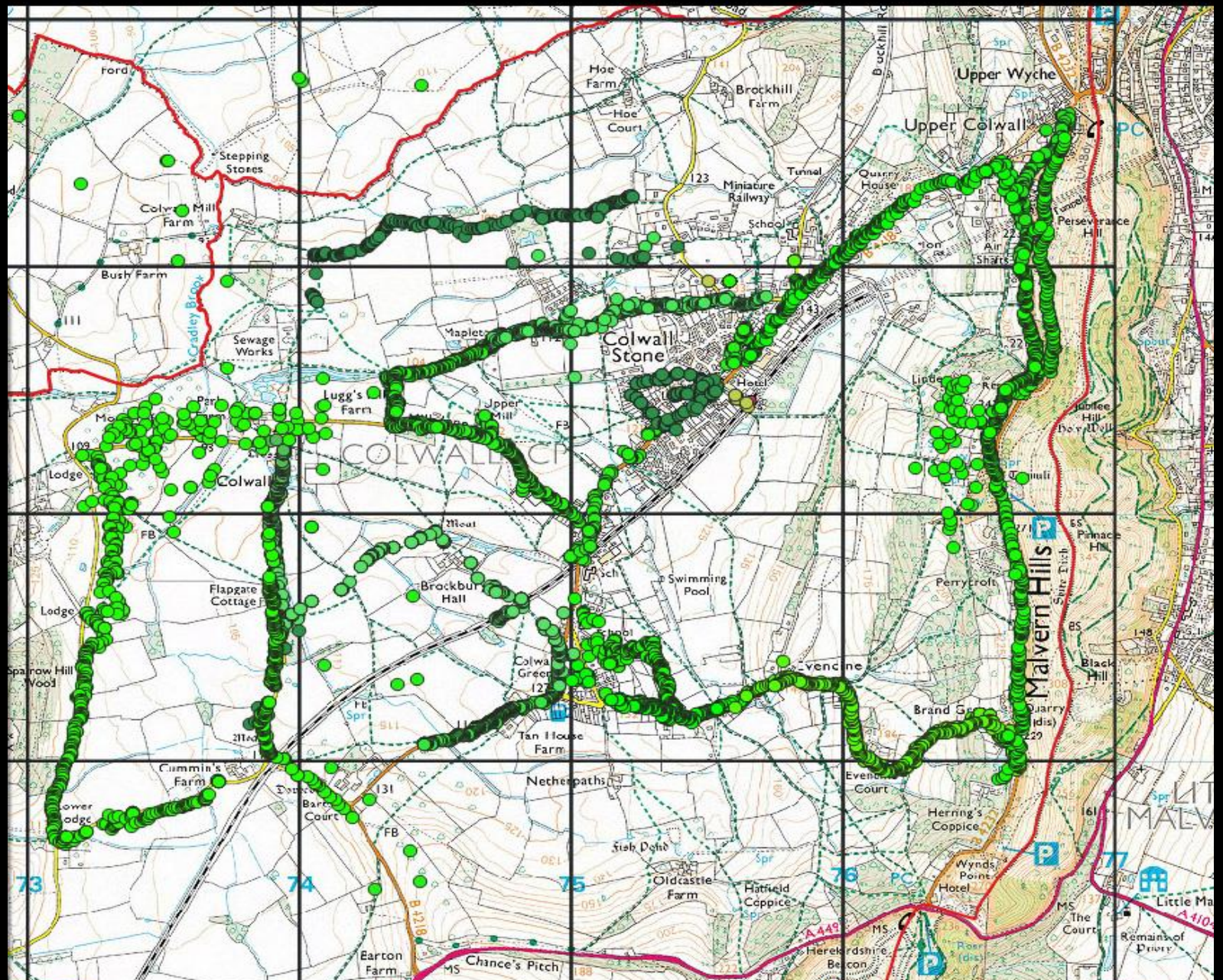
Bee orchid from Hurstans Farm Sollers Hope botanical survey of meadows for potential Local Nature Site status

Oak hook tip part of recording from moth traps at Fairoak Farm Dulas for uploading to county moth recorder

Recording all the Colwall hedgerow trees

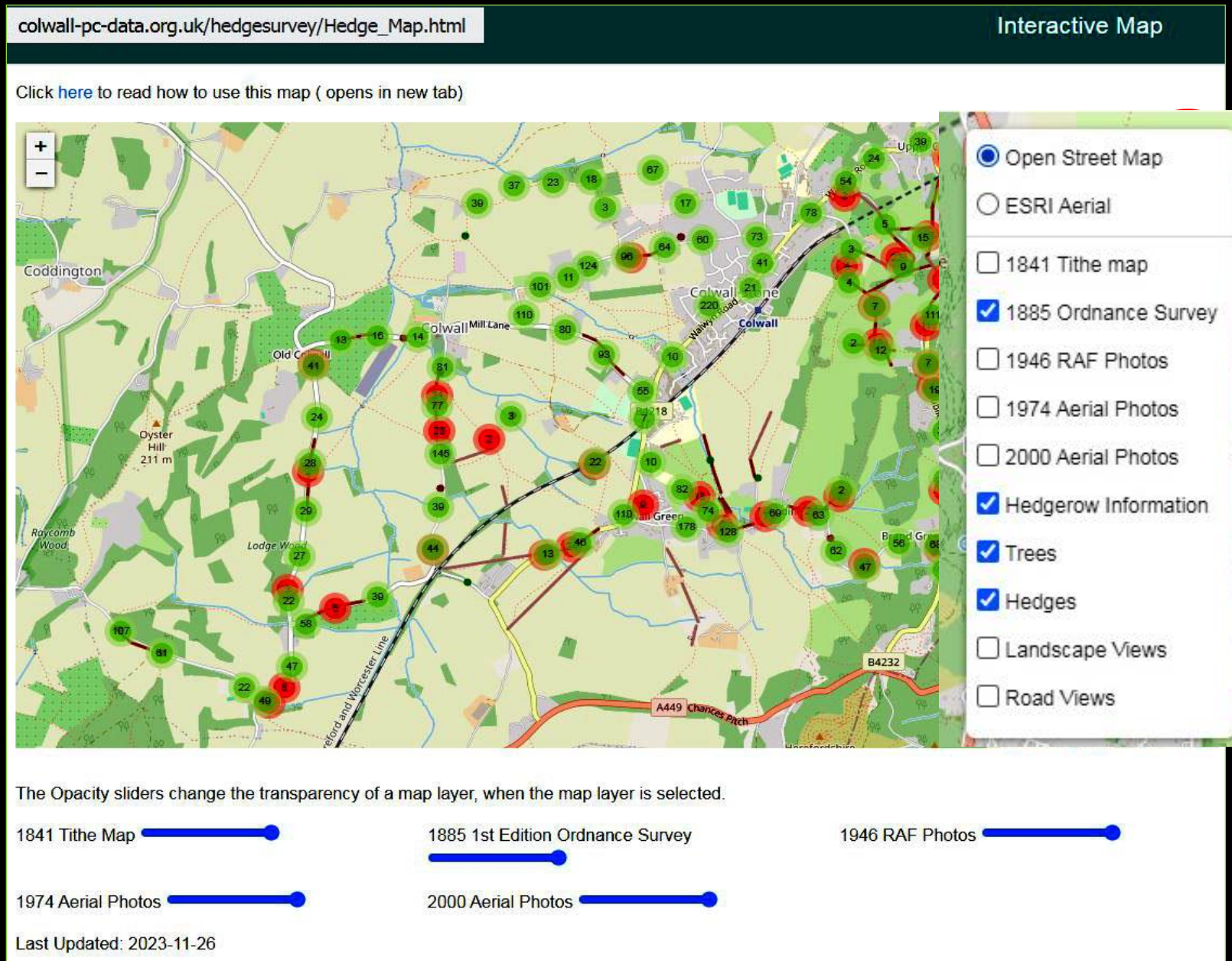


Location of hedgerow survey (+ some landscape) GPS mobile photos 2022



Walking on footpaths from one hedge to another is an opportunity to geo-tag landscape images

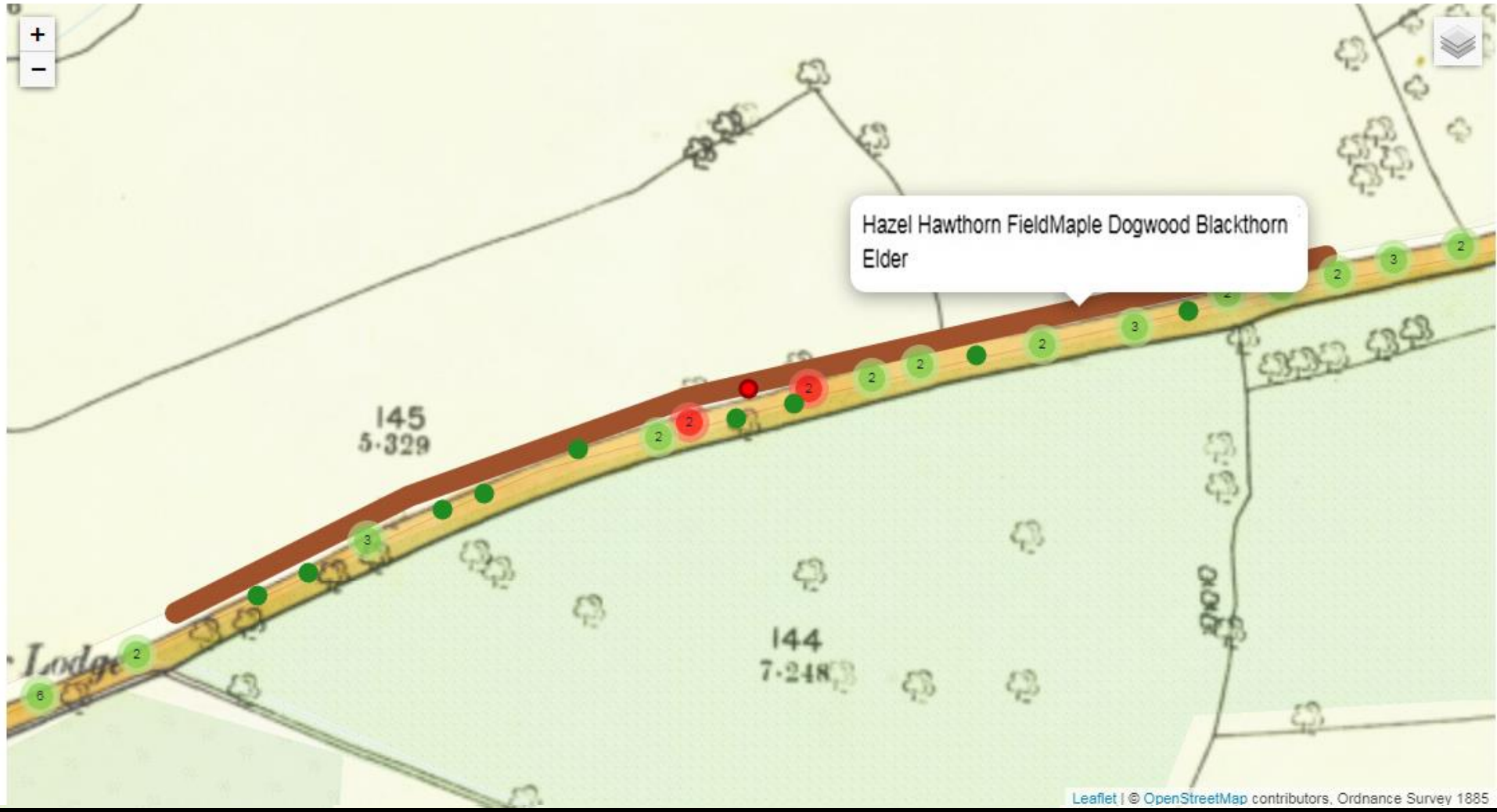
Results placed on the parish council website (QGIS2WEB + Leaflet) includes clickable historic maps and air photos



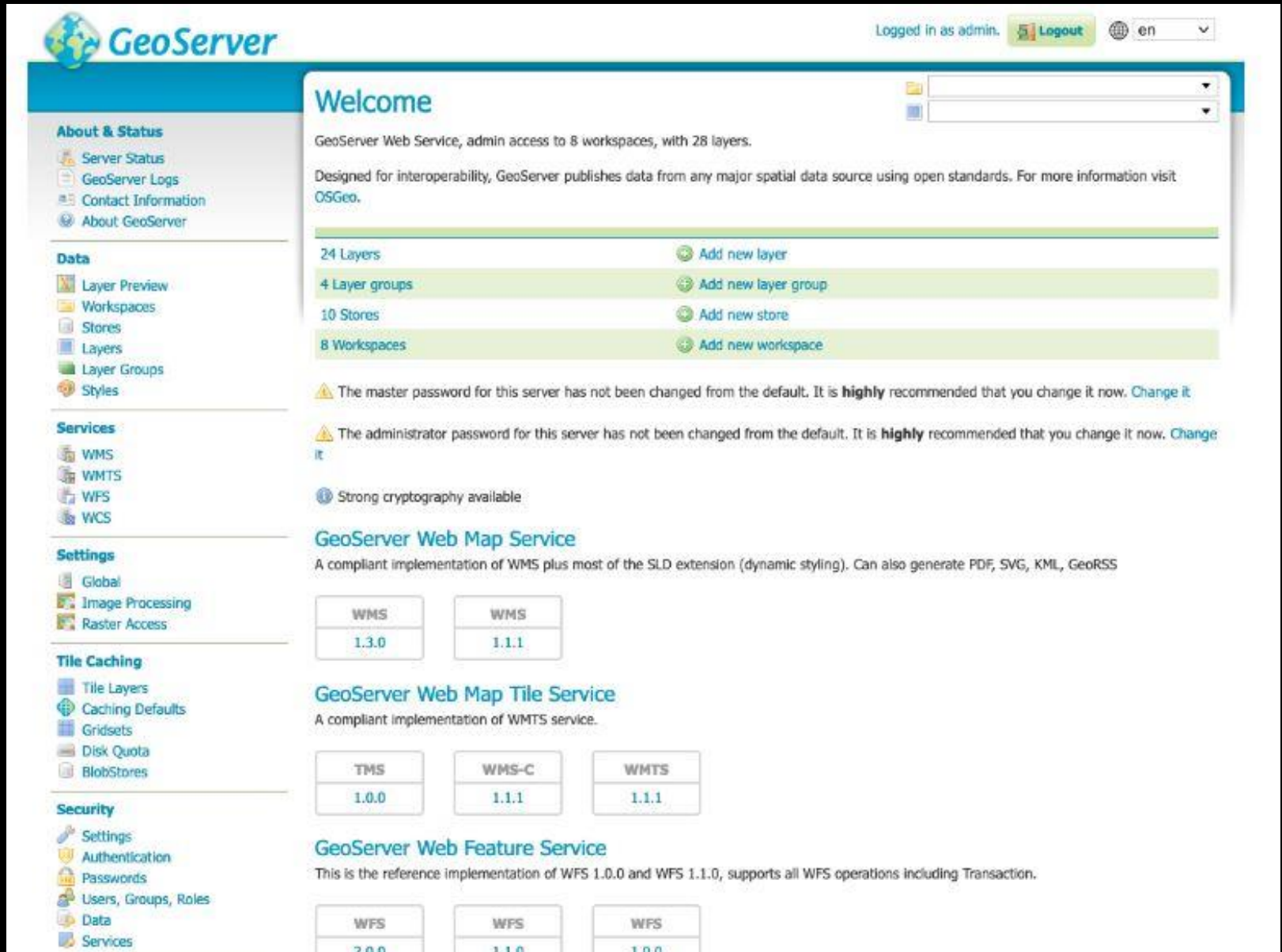
Vector point/line layer was all geo-tagged and species data for hedgerow lengths

Interactive Map

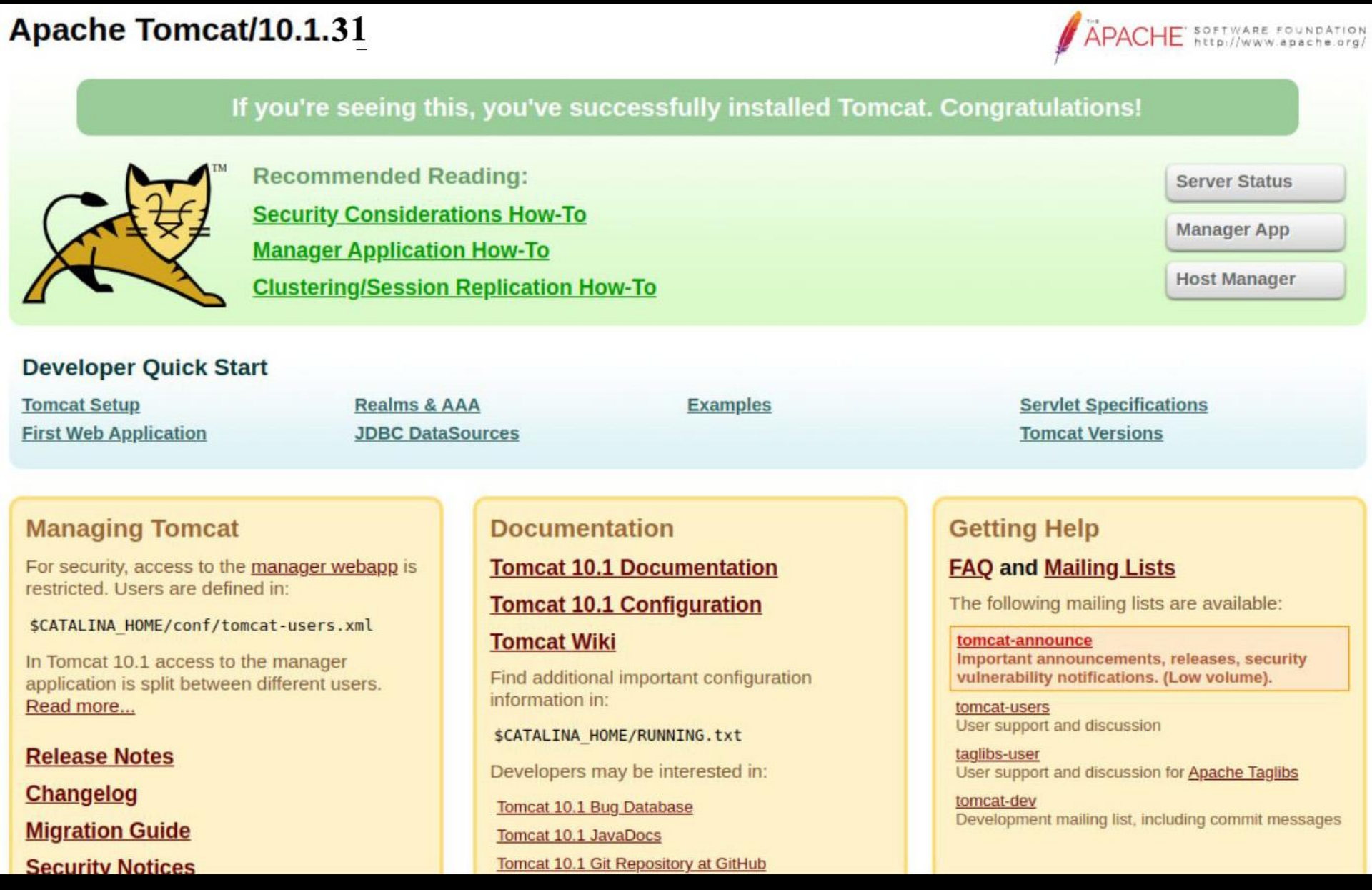
Click here to read how to use this map (opens in new tab)



Whole project needs to placed online in an interactive user friendly way. I've been trying to develop Geoserver running on Tomcat (as advised) I'm on Ubuntu server 22.04.



Can’t even get Tomcat server to function. I’ve followed both GeoServer and Tomcat installations to the letter (have current JRE). Is there an easier way? I ask this audience!



perhaps the currently being developed and crowd-funded new version of GeoServer 3 will be easily to work with for newbies??

With that, its goodbye from me and thanks for listening!

David Lovelace
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