

LANDSCAPE MAPPING



Significant Hedge Survey Final Report

by Samantha Barnes, Simon Bates and David Williams

A report summarising the process and conclusions of a community-led hedge survey across four parishes in the Tamar Valley Area of Outstanding Natural Beauty

2013



TamarValley
Area of Outstanding Natural Beauty



Tamar Valley Area of Outstanding Natural Beauty Significant Hedge Survey

Final report



Samantha Barnes, Simon Bates & Dave Williams

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Cover photo: Panorama of a hedged lane in Calstock Parish. V. Clare © Tamar Valley AONB

1) Executive summary

The hedges of Devon and Cornwall are vital components within the character of the landscape, and contribute to the special qualities of the Tamar Valley Area of Outstanding Natural Beauty (AONB). As part of field trial 3 within the Cordiale project it was felt that a community-orientated activity focused on recording and understanding these landscape features would help achieve the aims of the Cordiale project¹. At the same time, work being delivered in other field trials and by other partners looking at re-establishing the practice of harvesting woodfuel from hedges was being replicated in the Tamar Valley.

If 50% of hedges and 75% of small woods are managed for fuel across the four Cordiale parishes², there could be enough energy to heat 111 average houses in Bere Ferrers, 130 in Buckland Monachorum, 159 in Calstock and 77 in St Dominick³, which although a potentially positive sustainable result, brought to light that using hedges for woodfuel could impact on their biodiversity and cultural values, and may even have detrimental impacts on landscape character. It was therefore decided that the significance of hedges should be assessed using the Hedgerow Regulations criteria for determining significant hedges (1997). This could then form a baseline for effectively managing hedges for woodfuel whilst maintaining their natural and cultural values.

The significant hedge survey was initiated in March 2012, a methodology compiled, volunteers from the Cordiale parishes gathered, training given, and the survey carried out. This report describes each step of the process and the successes and issues encountered along the way.

An analysis of the results suggests that almost every 30m stretch of hedge surveyed is 'significant' in terms of the Hedgerow Regulations 1997. Some of the results included that the most common hedge structure type was the 'Cornish' hedge; almost 50% of hedges surveyed had been flailed; and that 77% of hedges had at least 5 woody species, indicating that they are 'significant' on this criterion alone.

The resulting data and GIS mapping can be made available to anyone with an interest in the management of the Tamar Valley landscape.

The methodology has been turned into a 'tool' as part of the Cordiale toolkit, available at www.cordialeproject.eu/en/toolkit. This is freely available to community groups who wish to undertake their own hedge surveys, and we feel that it is simpler to use than existing methodologies such as that by Defra. However, we also realise that our data is incompatible with the database used by Defra (Hedgelinek); this is discussed in this report.

¹ <http://www.cordialeproject.eu/en/about>

² Calstock and St Dominick in Cornwall, and Buckland Monachorum and Bere Ferrers in Devon.

³ Wolton & Davey, 2012 (report available at: http://www.cordialeproject.eu/en/toolkit/case-stories/cs17_woodfuel_in_the_tamar_valley/)

2) Introduction: why our hedges are important

The hedged field boundaries of the Tamar Valley, within both Devon and Cornwall, are important contributors to landscape character. They tell the story of the development of the landscape, and define ancient and more recently enclosed land. This development is particularly conspicuous in Calstock parish where the sinuous medieval boundaries defining the enclosed strips of former open fields around Harrowbarrow and Metherell contrast with the regular eighteenth and nineteenth enclosures on Kit Hill.

Hedge boundary lines on the Bere Peninsula tell an even clearer story - that of little landscape change, as many marked on a map from 1737 can still be identified today.



1737 map of Bere Ferrers parish, showing 'Colliton' and 'Allerwell', and the field boundaries running south towards the settlement of Bere Ferrers.



Modern 25" OS map showing the same area – whilst place names have evolved to become Collytown and Hallowell, many of the field boundaries – and importantly the track between Collytown and Bere Ferrers – are extant.
OS Licence Number 100051681

Hedges define land ownership and agricultural and horticultural methods, and the changes to them; and were historically also important in the south west to provide protection for field crops such as flowering bulbs and early strawberries. Boundaries also define a rich network of highways, many of which provide evidence for ancient links. These hedges should be looked at differently to field hedges, as they are more likely to have a deeper cycle of development, as they are adapted as road networks change or settlements grow.

The archaeological potential of hedges to provide evidence of human interaction with the landscape throughout time is highlighted through specific criteria in the Hedgerow Regulations 1997, where a hedge is regarded as significant if it is included within a Scheduled Ancient Monument or recorded within the Historic Environment Record⁴.



Section of hedge at Berra Tor on the edge of Dartmoor, the far part of the hedge is a field boundary; the nearer section (on the right of the picture) forms the boundary of an Iron Age camp, a Scheduled Ancient Monument (Photo: © Tamar Valley AONB)

Some of Devon and Cornwall's hedges grow on banks that are perhaps 4,000 years old, and others are remnants of the original wildwood that covered the landscape. In Devon, it is thought that at least a quarter of all hedges are more than 800 years old. That's older than most of our parish churches! In the farmed landscape, these hedges and banks represent continuity and link back to the wildwood.

The UK Biodiversity Action Plan lists hedges as a priority habitat. The hedges of the Tamar Valley are home to rare species such as bastard balm (*Melittis melissophyllum*), and act as feeding corridors for bats.

Hedges generally require some form of management, but often the wood that is removed is discarded. The potential timber value of hedgerow trees, and smaller material, can be an effective source of woodfuel, especially if chipped and used for biomass. If managed effectively this can be a sustainable form of fuel in the context of climate change. A clear understanding of if and why our hedges are significant is important to help guide future management, ensuring that this important element of landscape character is protected and enhanced.

For more on the importance of hedges see the Hedgeline website:

http://www.hedgeline.org.uk/importance-hedges-and-hedgerows.htm?sourcedate=&highlight=ajaxSearch_highlight+ajaxSearch_highlight1#Overview_1

⁴ The Hedgerow Regulations 1997, Schedule I, Part II, Paragraphs 2 and 3.

3) Aims

a) Objectives

- a) Enhance understanding of the evolution of the Tamar Valley landscape.
- b) Involve the public of all ages in a fun and informative way.
- c) Begin to identify hedges that are important for history and wildlife.
- d) Identify 'significant' hedges within the meaning of the 1997 Hedgerow Act and encourage parishes to protect them.
- e) Gain an accurate measure of potential woodfuel from hedges.
- f) Publish a hedge survey method that meets objectives a-e, as one of the Cordiale project tools.

b) Audiences

Based on these objectives the project team identified three audiences to whom the results of the survey could be of use and interest⁵:

- 1) Protect and enhance: Local Planning Authorities; Parish Councils, Natural England, landowners, Dartmoor National Park.
- 2) Technical: French Cordiale partners, Defra, County hedge groups.
- 3) Education: Volunteers, local history and archaeology groups, Tamar Valley AONB, school children, cubs/scouts.

4) Process

The methodology was compiled by the Cordiale team at the Tamar Valley AONB to be used by volunteer surveyors for hedges across four parishes within the AONB: Calstock and St Dominick in Cornwall, and Buckland Monachorum and Bere Ferrers in Devon. The full methodology is available in the Cordiale toolkit⁶.

a) The survey form and guidance

The need to develop a new survey method was partly defined by the recognition of hedges as features across a wider landscape. An existing methodology by Defra⁷ focuses at a much smaller scale, looking in detail at each element of the growing hedge rather than its landscape context, and is aimed at the more experienced surveyor. It was felt that this level of complexity was too great for the volunteers the project would potentially attract.

The Hedge Importance Test (HIT) developed by Robert Meneer⁸ has more focus on local distinctiveness, structure and hedge furniture, but does not answer some of the questions that might identify a hedge as being 'significant'. Therefore it was decided to compile a survey method based on both of these methods, augmenting it with knowledge of the local landscape character and species records.

The resulting survey form comprised four sections, on history, structure and location, species, and management. Alongside this were sections to gather basic data about landowners, surveyors, and the side of the hedge surveyed. By trialing the initial form at a local hedge location, guidance specific to the Tamar Valley AONB was compiled. For example, we referred to the boundary structure types identified by Cornwall Archaeological Unit in 1998⁹; and added in a list of all the woody and woodland species from the Hedgerow Regulations 1997, but within

⁵ These groups are not exclusive, and we anticipate that the results will be of interest to a varied audience.

⁶ http://www.cordialeproject.eu/en/toolkit/tools/tool_02_significant_hedge_identification_methodology/

⁷ Defra (2007) Hedgerow Survey Handbook.

⁸ R. Meneer (2005) Hedge (and Wall) Importance Test.

⁹ E. Bull (1998) Cornwall's Historic Field Boundaries: a review

that highlighted those least-likely to be encountered in the Tamar Valley. However, we retained certain elements such as the Defra guidance on what constitutes 'a hedge' within the hedge network, and the length of hedge to be surveyed¹⁰.

The boundary structure types as identified by Cornwall Archaeological Unit were analysed and an identification sheet of the six definitive types that might be found in the Tamar Valley drawn up. Additionally, seventeen variations identifying the amount and type of growth in a hedge was compiled.

It was never intended that this survey form would be the definitive version, and that from its use in the field we could monitor its usefulness and respond to issues. The most-recent versions are included in the Cordiale tool.

b) Recruiting volunteers

It was always an aim of the project to include local people in the data-gathering element of the hedge survey. This would help fulfill the Cordiale objectives of building deeper understanding of the distinctive character of landscapes and inspire communities to engage with that character.

A call for volunteers was made early in 2012. Publicity included an article on historic hedges in the Tamar Valley AONB newsletter 'The Valley'; advertising via the Tamar Valley AONB website and Facebook page; a press release and subsequent articles in local press and an interview with BBC Radio Devon; and passing the message via word of mouth at various festivals and events the AONB team attended.

After around six weeks forty volunteers with a range of skills and knowledge had registered their interest. Whilst these skills could be utilised for the project, it was also hoped that the volunteers would gain new skills and be inspired to take these forward to future projects and for their personal goals. Each volunteer was asked to rate their knowledge of archaeology and species identification, in order for the project team to structure training as appropriate. It also enabled groups to be formed for the training days with a mix of knowledge and experience.

c) Identifying priority hedges

As the survey was to cover four parishes within the AONB, as a starting point it was decided to choose a selection of 'priority' hedges. By analysing current Ordnance Survey (OS) maps the team were able to identify the long sinuous boundaries of former open-field systems (C8-12); the curving boundaries of these open fields as they were enclosed in the latter part of the C8-12; boundaries enclosing farmsteads, manors and small settlements; and boundaries included in historic features and ancient monuments.

By comparing current and historic mapping a selection of boundaries that related to historic routeways and field systems in place in the eighteenth and nineteenth centuries were selected. Some of these hedges were ground truthed, but their actual character was to be determined by the volunteer surveyors in the field (for example, a boundary marked on the 1737 map of Bere Ferrers parish and the current OS map, may in reality be a post and rail fence).

This selection of potentially historically significant boundaries was added to with biodiversity 'hot spots' informed by parish biodiversity audits. All of the boundaries were then identified on current OS mapping, and ranged from boundaries up to two kilometers long along roadways, to short sections bounding woodland.

¹⁰ Defra (2007) Hedgerow Survey Handbook, pp.11 & 17.

d) Training

In order to ensure consistency when surveying, the AONB project team organised two training sessions in spring 2012, one in Devon at Buckland Abbey (National Trust) and one in Cornwall at the Tamar Valley Centre, home to the AONB team. The sessions were identical, and began with presentations on the historic landscape by local volunteer Dave Williams; and identifying priority hedges (see above). In order to make the session as hands-on as possible two workshops were held, on documentary sources and species identification. The first encouraged the participants to examine historic maps and use web-based resources to find out more about the historic development of a hedge; and the second took place outside led by ecologist Anne Harvey.



*Volunteers undertaking historic map analysis training at Buckland Abbey
(Photo: © Tamar Valley AONB)*



*Volunteers discuss a laid hedge near to the Tamar Valley Centre with Anne Harvey
(Photo: © Tamar Valley AONB)*

The volunteers were then formed into groups, based on the parish they lived in, creating four groups of between four and twelve volunteers. Each group identified a 'facilitator' to encourage participation, be a central point for holding blank survey forms and maps, and feed back to the project officers at regular intervals. Within those groups the volunteers worked in pairs to support each other through their range of knowledge and skills. The group was then given full health and safety instructions and a survey pack containing survey forms and guidance, plant identification sheets (including one on Tamar Valley daffodils researched by volunteer Dr Frances Howard), and a letter of introduction to landowners.

4e) Maps and resources

The first section of the survey form comprised a desk based assessment, aimed at encouraging the volunteer surveyors to understand the context of the hedge in the landscape and any value it may already have attributed to it. This would relate to the entire hedge and not just the 30m surveyed in the field.

Copies of the 1st and 2nd edition historic Ordnance Survey maps were provided by the AONB to each parish group, and where available a copy of the Tithe map and apportionment (c.1830) and earlier estate or manorial maps. The latter were only found for Bere Ferrers parish (1737) and Calstock (1815 and a 1731 map of the Cotehele estate). The volunteers were also directed to web-based resources such as Heritage Gateway (for finding statutory designated heritage sites and Local Authority Historic Environment Record information); local authority websites; and Nature on the Map and Magic website (for natural designations). For those working on hedges in

Calstock parish the 1st edition OS map, Tithe map and Historic Environment Record data was accessible through the Calstock Parish Interactive Heritage map¹¹.

4f) GIS

The priority hedges (see: Section 4c) were plotted as polylines on ArcView 9.3. This task was undertaken during the early stages of the survey, as a printed map at a scale of 1:10000 was given to volunteers to mark their 30m surveyed stretch, position/location of photographs, and any other notes. A completed database would also be linked to this map (see below), creating an accessible resource to be used by stakeholders.

4g) Data collation and analysis

As part of their training packs, the volunteer surveyors were provided with blank survey forms. After collecting their 1:10,000 OS map and more forms as required, the volunteers surveyed their allocated hedges, taking photographs as a point-in-time record and also recording significant views, hedge furniture and any other interesting elements. The maps, forms and photographs were then returned to the AONB where they were checked for completeness and a unique identification number allocated. These numbers were based on the parish, the hedge in terms of when it was mapped as part of the project, and the 30m stretch within that. For example: BF2.3 = Bere Ferrers parish / the second hedge mapped / the third 30m stretch within that hedge. A short name was also given for internal administrative use.

Dave Williams, a local volunteer involved in the hedge survey from its conception, and trained in landscape archaeology, took on the task of entering the data. The database was then linked to a GIS layer. By using GIS the data can be interrogated, analysed and shared. It is particularly useful as an aid for decision making in land use, resource allocation, environmental, transport and, from an archaeological and historic perspective, landscape analysis. Fundamentally, GIS software allows a computer to present information to the user as an interactive map that incorporates textual and numeric data.

Although the character of the boundary data collected essentially lends itself to spatial analysis using GIS software, it was decided that entering the data from the survey sheets into a digital format through the attribute table of a mapping may result in an unwieldy and confusing dataset. The data was therefore transcribed using a MS Access database. Entering the data into small but related tables reduced transcription errors, and created an MS Access form that would allow surveyors to enter data directly into a digital format during future surveys without the need for specialist software. The transcribed data was later copied into a compatible GIS attribute table.

The resulting GIS mapping layer was linked to the attribute table, creating a 'clickable' map showing all the 30m stretches of hedge surveyed with their associated survey data. Where stakeholders have compatible GIS software the survey data can be shared as a shapefile.

4h) Volunteer review sessions

To ensure communication and momentum, review sessions were held throughout 2012 and 2013. Interim training sessions and events were also held, including a presentation by Ann Reynolds of Cornwall Council Historic Environment Service on field systems in Cornwall's historic landscape; a walk and talk led by Martin Summers at Bere Ferrers looking at uses of hedge plants, for example for medicine; a fern identification session at Cotehele, led by Clare Roper; a

¹¹ <http://heritage.tamarvalley.org.uk>

plant identification session led by Anne Harvey for those requiring more training; a walk and talk at Kit Hill and Luckett discovering more about the place of hedges in the historic landscape. The three 'formal' review sessions were held at the Tamar Valley Centre where feedback was given to and invited from the participants, and issues resolved.



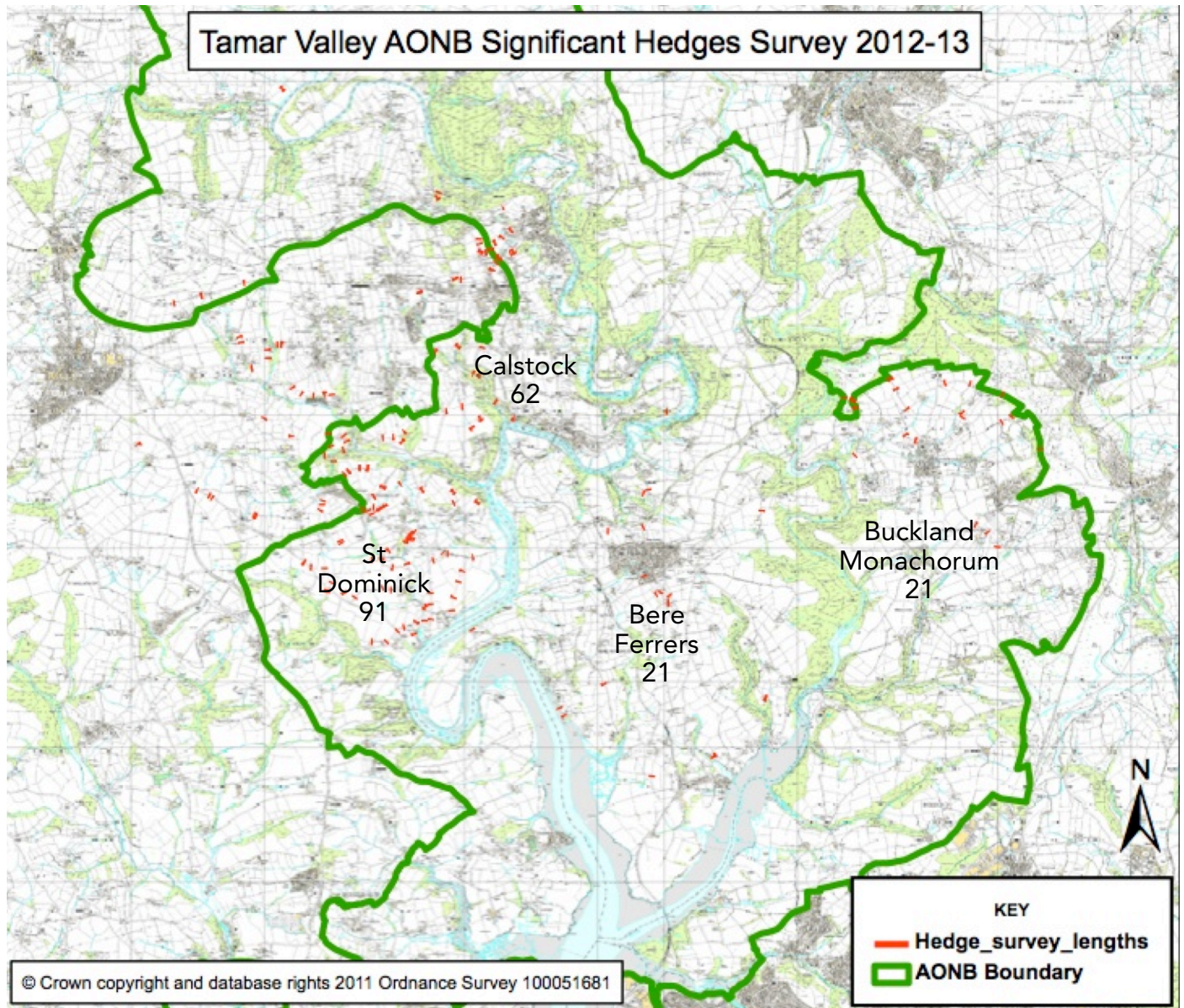
*Volunteer review session and training on fern identification at the Tamar Valley Centre
(Photo: © Tamar Valley AONB)*



*Walk and talk at Kit Hill looking at the wider historic landscape, led by volunteer Dave Williams
(Photo: © Tamar Valley AONB)*

5) Results

5a) Total number of 30m lengths of hedges surveyed¹²



TOTAL=195

5b) Percentage of significant hedges within the four parishes

From only a brief analysis of the data it is clear that a large percentage of the 195 hedges within which one or more 30m lengths were surveyed can be considered as 'significant' within the criteria of the Hedgerow Regulations 1997. Some hedges can immediately be said to not be significant within the criteria: an example is BF23.1 (Marythorne Road, Bere Alston) as Regulations guidance states 'They do not apply...to garden hedges...defined as hedgerows within, or marking a boundary of, the curtilage of a dwelling house'.¹³ Although one side of BF23.1 also bounds a mixed woodland the Regulations criteria to make it significant still do not

¹² Large scale version of this map included at Appendix 3.

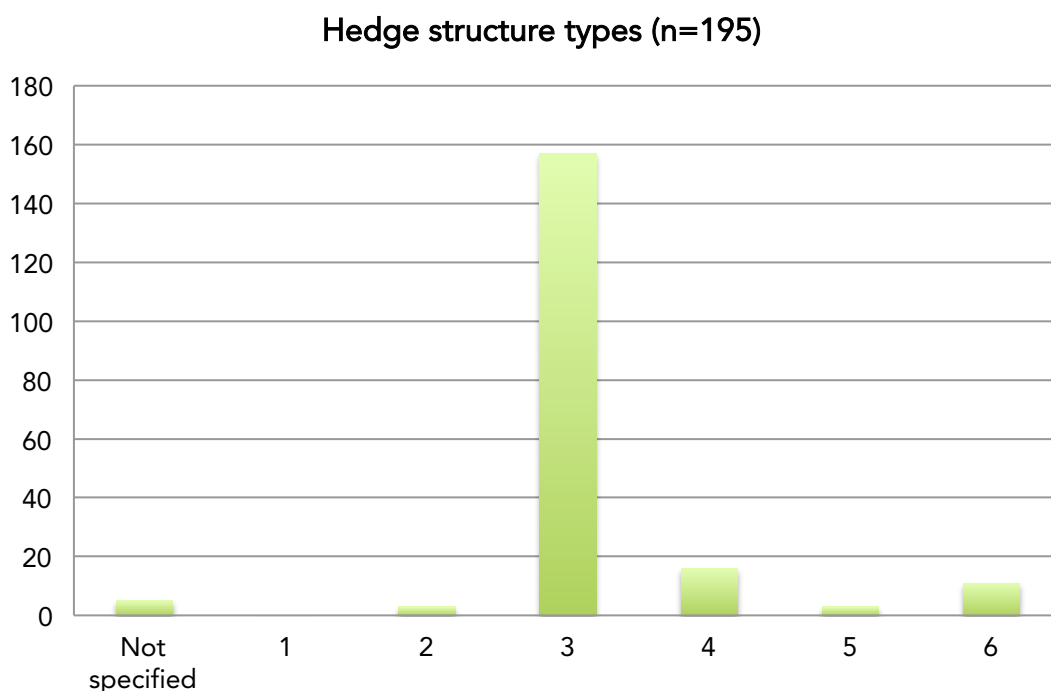
¹³ DEFRA *The Hedgerow Regulations 1997: a guide to law and good practice* (1997) p. 12, para. 3.7.

apply.¹⁴ Further comments on the advantages of using the Hedgerow Regulations criteria are included in the conclusion.



Hedgebank at Marythorne Road, Bere Alston from the surveyor's garden
(Photo: W. Keatley © Tamar Valley AONB)

5c) Hedge types identified



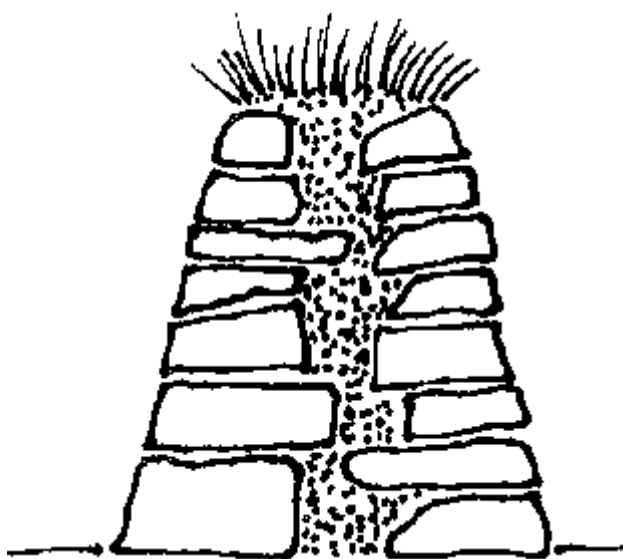
Four of the six structure types as identified at the beginning of the project¹⁵ were found during the survey. Types 1 and 2 were very scarce, probably as these are purely of stone construction and there is little loose stone in the area (such hedges are also not covered by the Hedgerow Regulations criteria, unless they have a soil infill and vegetation on top¹⁶). These four types were

¹⁴ *ibid.*, para.3.6.

¹⁵ See Appendix I

¹⁶ *ibid.*, para.3.5.

further investigated by visiting identified hedges, photographs taken, and an A5 'identification guide' compiled. There may be additional hedge types to these four, but the volunteers were asked to choose the one closest to their surveyed hedge.

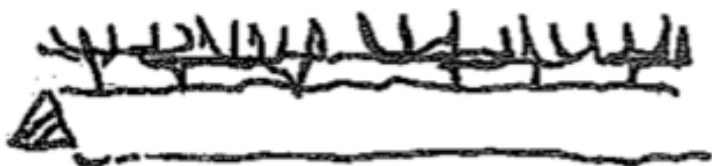


Stone-faced earth wall / 'Cornish' hedge – diagram taken from Cornwall Council Archaeological Unit boundary types report

A typical 'Cornish' hedge at St Ann's Chapel, Calstock parish, Cornwall. (Photo: J. Croft © Tamar Valley AONB)

5d) Hedge styles identified

The 'style' of hedge refers to the amount of growth on the hedgebank (where appropriate) and the percentage of gaps within the 30m stretch surveyed. The most common style (46%) was a bank with a low flailed hedge. There was also a good number of hedges of types 10 and 11; these represent a bank with a shrubby hedge and standard trees, with no gaps and gaps of >10% respectively. Types 6 and 16 were not identified at all (a bank with a low flailed hedge and >50% gaps; and a young recently planted hedge).



Type 4 style from identification sheet: a bank with a low flailed hedge (TVAONB)

Type 4 hedgebank in St Dominick parish (Photo: P.N. Sleep © Tamar Valley AONB).



Type 10 style from identification sheet (TVAONB)



Type 10 bank with standard trees in Buckland Monachorum parish
(Photo: C. Collett/J. Hart © Tamar Valley AONB)

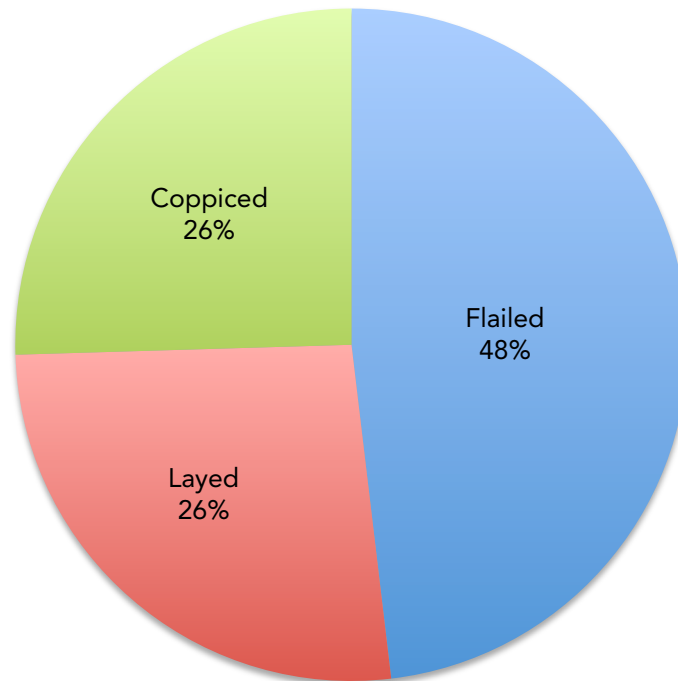


Type 11 style from identification sheet (TVAONB)



Type 11 hedgebank with >10% gaps near Chilsworthy, in Calstock Parish
(Photo: V. Clare © Tamar Valley AONB)

5e) Hedge management



The surveyors were asked to note whether there was evidence in the hedge of laying, pollarding, coppicing, felling, snedding, or if it had been recently cut. Unsurprisingly a high percentage of hedges had been flailed, as this is a locally recognised management practice. There were some good examples of both modern and historic laying and coppicing, although snedding (stripping side shoots from a branch) was not commonly recognised; this may be because it often takes place as part of hedge laying practice, and the management was identified as that instead. The impact of this on the significance of hedges is discussed in Section 7.

Comments were also made about the management of the hedges, many noting when barbed wire or post and wire fences were present. Where the hedge bounds public access (a footpath or road/track) the surveyors always commented on its condition.

5f) Historic environment

Whilst the data collated through this section of the survey is important for understanding the historic significance of hedges in the landscape, the most relevant outcomes relate to their relationship to designated and non-designated heritage assets, and the age of the hedge. Attempts to determine the latter have in the past been based on Hooper's Law, where the number of species in the hedge determines its age: a hedge will gain one species of tree, shrub or woody climber for every 100 years of life, or that 95% of 10 species hedges are between 800 and 1150 years old¹⁷. Hooper suggests that although his figures would not apply to every hedge – and indeed it has been suggested that this process does not work in the south west due to the number of ancient boundaries - 'the general rule of diversity increasing with age has been confirmed'. Instead of using this method, images of different age hedges used alongside available historic mapping enabled the volunteers to gain some idea of the age of the hedge. Most were thought to be late medieval.

¹⁷ Hooper, M.D. (1981) 'Hedgerows as a resource'. In: Last, F.T.; Gardiner, A.S., (eds.) *Forest and woodland ecology: an account of research being done in ITE*. Cambridge, NERC/Institute of Terrestrial Ecology, 20-23. (ITE Symposium, 8), p.22.



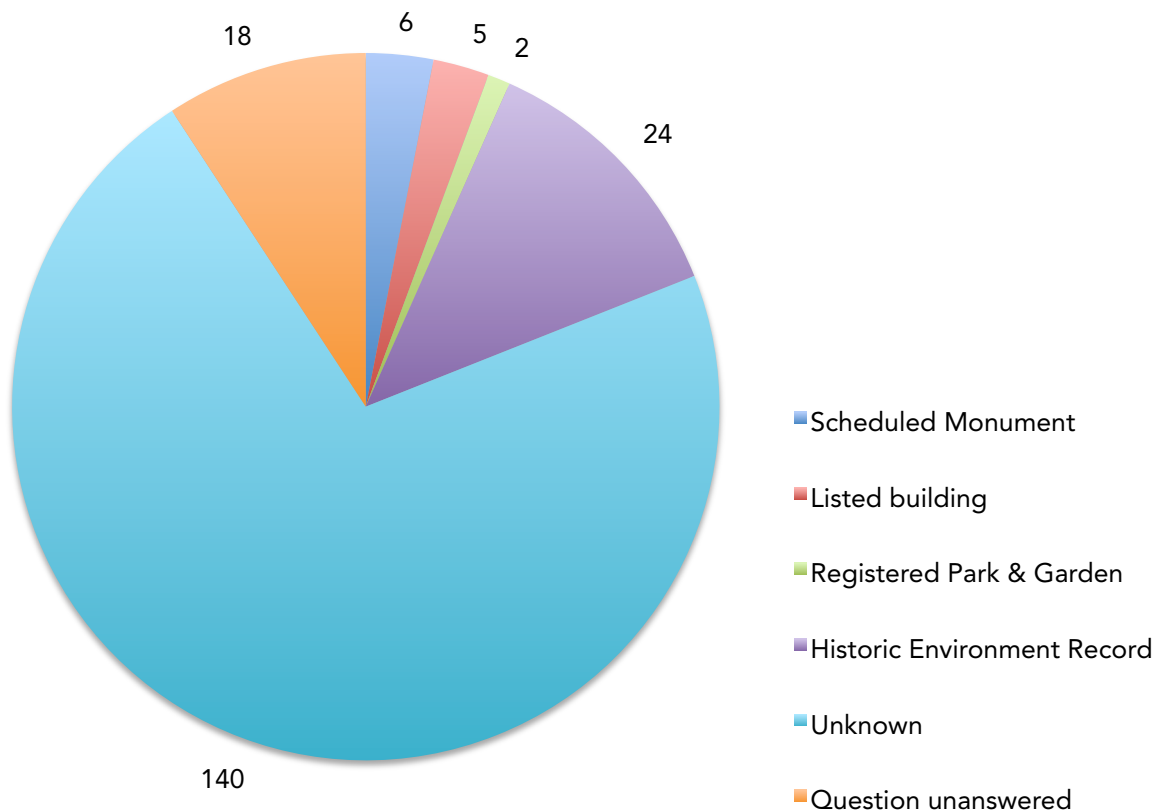
These fields have been enclosed from medieval open field systems in the 14th to 17th centuries. There are lots of good examples of this in the Tamar Valley, especially around Bohetherick and St Dominick.



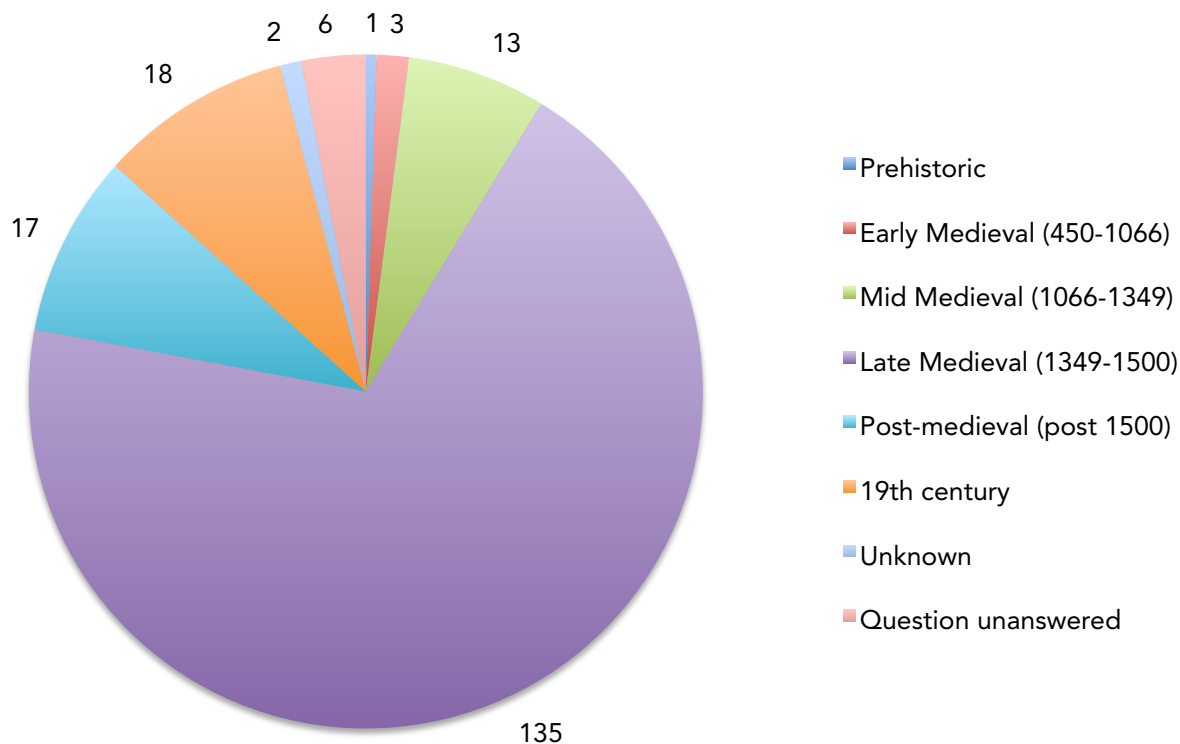
Typical and familiar fields of the 19th century, formed under the Enclosure Acts when large areas of rough ground were transformed into agricultural use. They are typified by their dead straight sides; these are at Hingston Down.

Examples of historic hedge patterns shown to volunteers to aid estimation of the age of a hedge (Photos: © Cornwall Council HES)

Number of hedges within 100m of a designated or identified site or monument (n=195)



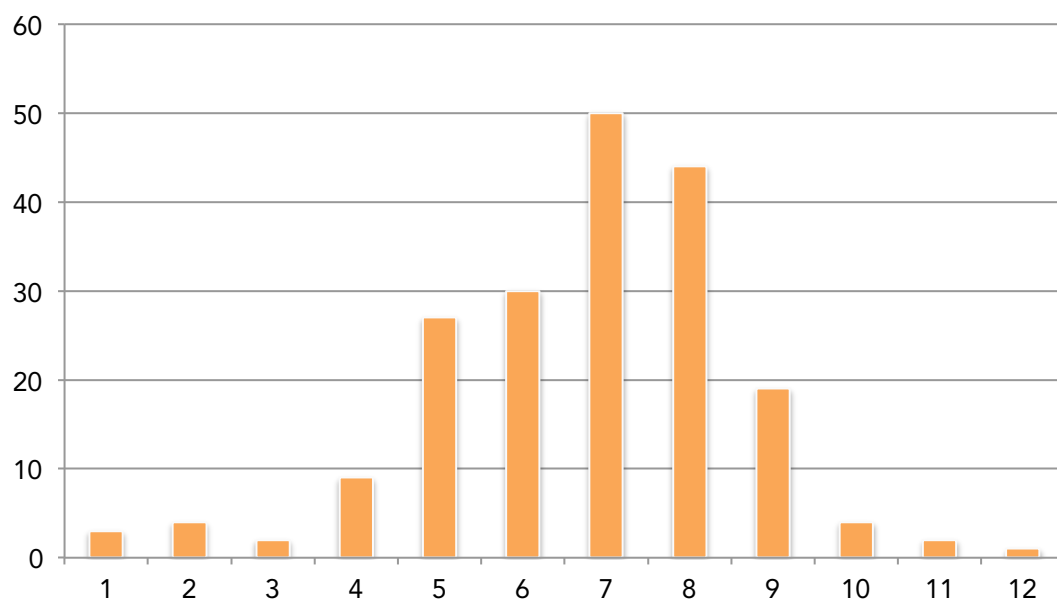
Suggested date of origin (n=195)



Provision for the surveyors to add their own local knowledge has provided us with interesting information, including local names for lanes (Zaggy Lane, Pensingers Lane, Pepper Hill); former uses of adjacent fields, including cherry orchards and strawberry growing; and routes between places, such as mine sites and churches. Intriguingly, the survey also revealed that Vogus Lane in St Dominick was once part of the London to Penzance motor rally route!

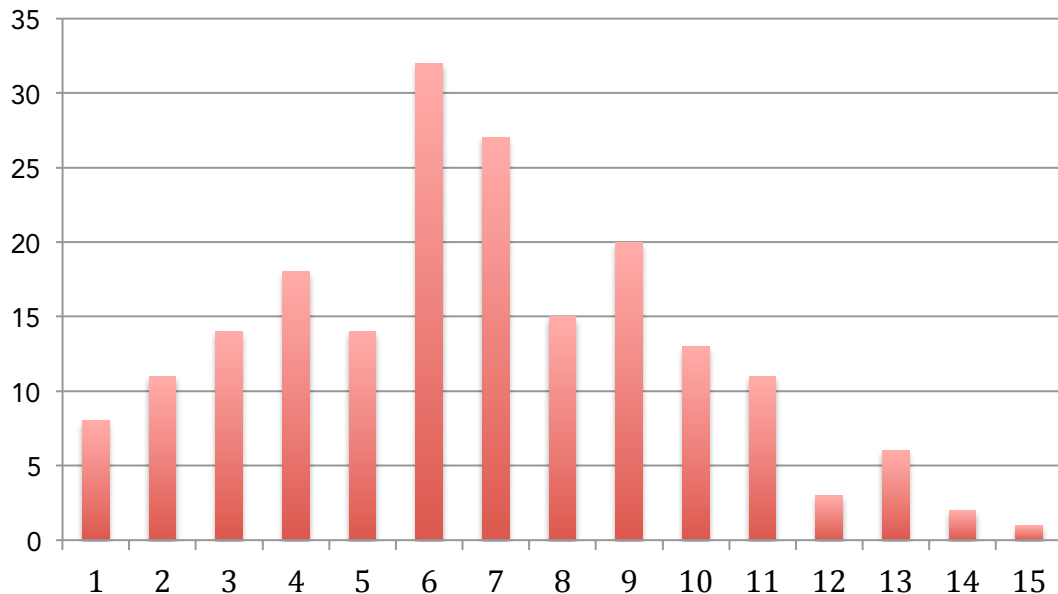
5g) Species

Total number of woody species recorded in a single 30m stretch



This table shows that hedges with 7 woody species in a 30m stretch were most frequently encountered. In fact, 150 (77%) of hedges had at least 5 woody species, indicating that (alongside the assumption that all the hedges are over 30 years old) they are 'significant' on this criterion alone, and that Tamar Valley hedges are diverse in this respect.

Number of woodland species in each 30m stretch



This table shows that hedges with 6 woodland species in a 30m stretch were most frequently encountered.

5h) Products and dissemination

The project team originally identified three outputs from the project. These are outlined below along with the actual output.

- 1) "The data will be used as part of an Atlas that will be produced as the final product of this part of the Cordiale project." *Alongside the toolkit on the Cordiale website is a 'Landscape Map', identifying unique landscape features within each of the protected landscapes in England and France who took part in the Cordiale project. The completed spatial data has been added to the map¹⁸. An added benefit of this map is that it links through to the tool, created as a result of the hedge survey, increasing its visibility to the public.*
- 2) "We will add the data to a spatial plan (a map), which we are planning as the final part of this 'Field Trial' as part of the Cordiale project. The map will identify elements of the historic and natural environment which should be protected and conserved, using a 'traffic light' system to identify elements where there is scope for change, or should be protected as an important and characteristic element of the Tamar Valley landscape (for example, the medieval field systems around Metherell)." *We undertook some stakeholder events to gather interest in such a spatial plan. With the advent of Neighbourhood Plans it was decided that providing the data to Parish Councils and other stakeholders would be more beneficial. It is the local planning authority that make the decision whether a hedge is important or not and they MUST consult the parish council before they reach a decision during development proposals.*

¹⁸ <http://www.cordialeproject.eu/en/landscapes>. At the time the website was being constructed we did not have a complete database of the results of the hedge survey. Therefore this map is not a 'clickable' version and only shows the location of the surveyed hedges.

3) "We are considering creating an interactive-type map (similar to the Calstock Interactive Heritage Map) which would be put on our website. This would include all the data and have an option for local people to add more information and for us to add further research as it happens (for example, research into field names, ownership etc)." *Our data is available to anyone who enquires, and this is noted through our online communication. We will research how the data can be disseminated so that anyone can access it as a 'clickable' map, i.e. those without GIS access.*

Ultimately we see the tool on the Cordiale website as the principle means of disseminating the methodology developed during the project; and the completed dataset and accompanying GIS map as the means of disseminating the data. This report is only a summary of the process and results and should be an accompaniment to the other outputs.

6) Project achievements and improvements

Did we achieve our objectives?

- Enhance understanding of the evolution of the Tamar Valley landscape.
But this is only the beginning! Much more work will need to be done, and together with research already completed on landscape character will increase understanding and awareness of the special qualities of the AONB landscape.
- Involve the public of all ages in a fun and informative way.
See below.
- Begin to identify hedges that are important for history and wildlife.
Almost 100% of hedges surveyed are deemed to be 'significant' in terms of the Hedgerow Regulations 1997 criteria. This suggests that the hedged landscape of the AONB is very important, perhaps even unique.
- Identify 'significant' hedges within the meaning of the 1997 Hedgerow Act and encourage parishes to protect them.
See above; this report will be made available via the internet, and data provided to interested parties as required.
- Gain an accurate measure of potential woodfuel from hedges.
Work is still ongoing; completed reports on the subject are available through the Cordiale toolkit¹⁹.
- Publish a hedge survey method that meets objectives a-e, as one of the Cordiale project tools.
Achieved through the publication of the online toolkit.

The two main successes of the project was the community reaction and willingness of volunteers to take part; and the feedback from the volunteers regarding the high standard of training and the new skills they learnt.

A Survey Monkey poll was created by the Cordiale evaluation team (Pengelly Consultants) to gather feedback from participants of field trial 3, of which this project was an element²⁰. As this poll was not specific to the hedge survey, the percentage of volunteer surveyors who responded is unknown. Interestingly however, out of the 21 respondents several chose volunteering as their motivation to be involved in the Field Trial.

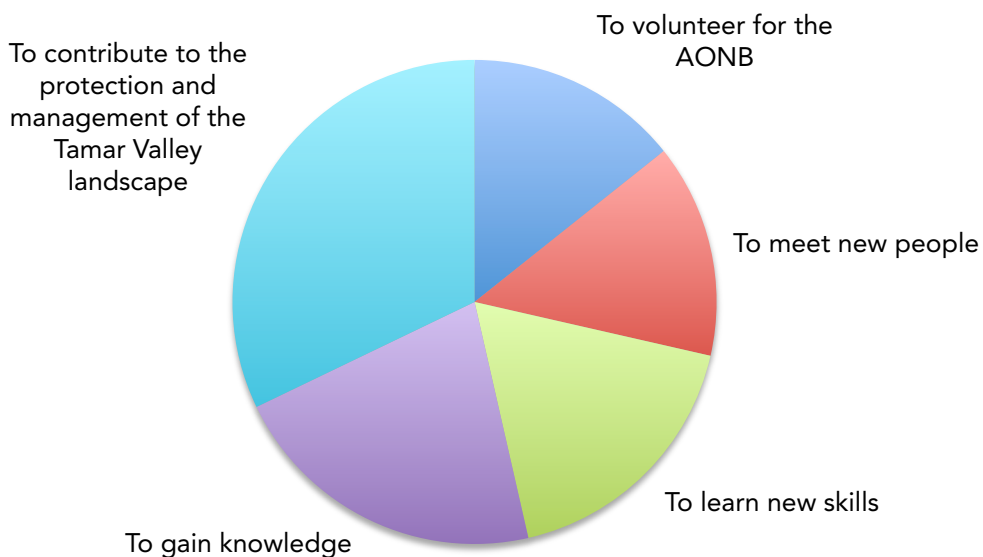
¹⁹ http://www.cordialeproject.eu/en/toolkit/case-stories/cs17_woodfuel_in_the_tamar_valley/

²⁰ Other sub projects and events in Field Trial 3 that included volunteer participation included a community archaeology weekend in Bere Alston and two 'BioBlitz' events on the Pentillie estate.



A 'Wordle' of responses to the question 'What was your motivation to be involved in this Field Trial?'

In order to gather specific feedback from the surveyors, the AONB Cordiale team devised a separate Survey Monkey poll that was sent out to all of the surveyors after completion of the surveys²¹. Ten volunteers responded, and were able to give more than one answer to a question. Asking the same question ('Why did you sign up to become a volunteer hedge surveyor?') produced the following result:



Encouragingly all of the respondents felt that their knowledge of landscape history/archaeology, species recognition, and hedge management increased following the training and surveying. The question 'Please describe your experience of the hedge survey project in three words' produced the following answers:

²¹ See Appendix 2 for a full list of the questions and responses.



A quote from one of the volunteers following completion of the survey sums this up:

"I became involved as a volunteer in the Tamar Valley AONB hedgerow survey programme because of my love of nature, and wild flowers in particular, and had given no thought to the wall beneath the plants. I imagined the hedge was built to keep farm animals in and Mother Nature threw in the wild flowers and ferns, I had no idea that the trees on top were planted by man and thought that they too popped up by magic...I had a lot to learn.

When I began I could name possibly 15-20 of the flowering plants and thought that all the tall white flowers were Cow Parsley. So a book on wild flowers became a constant companion and there were always experts on hand to identify those plants we were unable to.

It may sound as if all I got out of my surveying experience was the ability to identify the flowers...but I learnt so much more along the way. I loved looking at all the maps online to estimate the age of the hedges; my favourites were the Tithe maps that named all the nearby fields and gave a glimpse of long--forgotten paths not visible from the ground, all of which gave more clues.

My surveying partner Sue and I would walk the length of our chosen hedge before selecting the section we would survey so of course we passed some of Cornwall's rich mining heritage along the way plus the site of a brickworks and an old railway line at other locations and I would look up their history. At Kit Hill it was the boundary stones that interested us so more research was needed, I also found a tiny flowering plant at Kit Hill that I had never seen before which turned out to be called Milkwort...I found the entire experience very rewarding, just as I have with all the other volunteering I have done with the AONB in the Tamar Valley."

The project also helped raise awareness of the Tamar Valley AONB, the designation and our work, and has helped in attracting more volunteers to support us across a range of projects.

A further achievement is the point in time record achieved for nearly 200 30m stretches of hedge across four parishes, almost 6km in total. Whilst this data may not be entirely accurate (see below) it provides a good picture of the significance and condition of our hedges. It has been a good starting point to further develop the survey method, and since the end of the project we have had some external interest in the tool, on which we await feedback.



*Volunteers surveying hedges in Bere Ferrers and Calstock parishes
(Photos: D. Lane & T. Ismail © Tamar Valley AONB)*

Despite these achievements, we also encountered some issues that will be analysed to improve the methodology and our approach when training volunteers. On an initial inspection of the survey data a number of problems became immediately apparent. Firstly, the intention of the design of the form was to force the surveyor to provide specific information about the section of hedge without the addition of spurious data that may complicate the data input process. Whilst the appearance of existing data was expected (and sometimes encouraged as free text), strictly adhering to this principle would have provided more consistent data.

Specific examples of inconsistent data include:

- Differentiation between location and description (occasionally hedge type and boundary type were presented in the 'Location' section rather than the 'Description' section).
- Poor answers to historical background section (considered a consequence of incomplete knowledge or guesswork).
- Disagreement with observable evidence (particularly on boundary and hedge types).

Where possible, these discrepancies were tidied up, desktop evidence re-examined and/or rapid field surveys delivered. The issues were accepted as being inevitable in some circumstances and these lapses were generally subsumed by the larger weight of accurate data.

A further issue was encountered when considering how the results should be disseminated. One of the original aims of the project was for decision makers to be able to use the results to inform development proposals, but most parish councils do not have the GIS capability for the data to be provided as such. Resources for producing a detailed report document have not been available. It was also proposed to add the data to the Hedgelink survey database²², but as the fields do not correspond to the standard survey method and form this has not been possible.

²² <https://secure.fera.defra.gov.uk/hedgerow/>

Whilst this has the disadvantage of data not being comparable to other hedges around the country, it has achieved some local conclusions, as outlined below.

7) Discussion

The following discussion summarises the findings of the survey for biodiversity, the historic environment and woodfuel. It is not intended to be definitive and should be seen as initial ideas resulting from this phase of the survey²³.

7a) Biodiversity

A good percentage of Tamar Valley hedges have high biodiversity significance.

The results of the survey suggest a high proportion of species-rich hedges: 77% of 30m lengths had at least five woody species, indicating that they are 'significant' on this criterion alone. Although not requested during the survey, it was noted by some surveyors that they also have a good range of fauna – for example glow-worms at Weir Quay and evidence for dormice. Nesting birds were also spotted. A Parish Biodiversity Audit carried out as part of the Cordiale project also identified that the Tamar Valley has 'an extensive network of species rich hedges'. Retention of hedges with good management practices will encourage these habitats to thrive.

7b) Historic environment and landscape

The local distinctiveness, unique heritage and historic character of the Tamar Valley is reflected in its hedged landscape.

The construction of hedges is a reminder of human interaction with the landscape, particularly in the medieval period, although the later, nineteenth-century enclosures are evidence of the constant development of the landscape. Their survival, and relationship to other features of historic significance (for example the Iron Age enclosure at Berra Tor) is a legacy that contribute to the remarkable heritage and local distinctiveness that are special to the Tamar Valley.

The results of the survey show that much of the local distinctiveness of the Tamar Valley can be expressed through landscape features. The relationship of hedges to routeways, linking farms and settlements with churches and mining sites; the names given to those routeways; and people's local knowledge about what fields were used for, all provide evidence for the integrity of the Tamar Valley people and their landscape.

The survey has confirmed that the Tamar Valley hedges have a high value in terms of the historic environment; the majority are thought to date to the late Medieval period (69%)²⁴ with a good proportion (19%) being related to sites recognised for their national significance (designated sites) or 'local' historic significance (Historic Environment Record entries); the latter often include field systems within which the hedges are integral²⁵. The survey has also identified several historic features that are as yet unrecorded; we will add these to the Calstock Interactive Map as appropriate and pass the information on to the county Historic Environment Records.

²³ Environmental Safeguard guidance is available on the Cordiale toolkit website: http://www.cordialeproject.eu/images/uploads/pdf/Env_safeguards_cover.pdf

²⁴ Throughout the review sessions it was noted that the surveyors had problems pinning down a date just from the style and pattern of the hedge, unless documentary evidence was available. Therefore this figure may not be accurate.

²⁵ This figure may be higher, as 81% of the responses to this question were 'Not known' or the question was not answered. This may be due to the lack of research undertaken by the surveyors.



*Metalled pathway to the east of Delaware Farm (CS7.4)
(Photo: J. Croft © Tamar Valley AONB)*



*Water channel or leat to the east of Delaware Farm
(CS7.4) (Photo: J. Croft © Tamar Valley AONB)*

Neither of these features had been formally identified and recorded. The survey project has enabled us to do this.

7c) Woodfuel

More research needs to be done into the benefits and implications of managing our historic and significant hedges for woodfuel.

Given that the vast majority of boundaries are banks with low flailed hedges, the existing fuel resource is low. There would appear to be three options available to increase the fuel value of these boundaries: (1) allow the existing woody species to grow up, planting trees such as oak, ash, beech, sycamore in the gaps; (2) select and tag existing tree species that have a good strong (preferably single) stem, trimming the immediately surrounding shrubs every three years to prevent competition with tagged trees; (3) replant the whole hedge with trees. The views of local farmers, who will ultimately carry out this work, need to be sought, but perhaps option 2 is the least costly in terms of labour.

The most frequent woody species is hawthorn, found in 84% of hedges, followed closely by hazel (83%). Pedunculate oak was found in 70%, rose 65%, ash 63%, blackthorn 62%. Surprisingly for a tree which, when mature, appears to dominate the landscape, beech was only found in 16% of hedges. Given this mixture of shrubs and trees, it would appear reasonable to assume that option 2 above could succeed if management reverted to a 'cut+coppice' regime. Allowing hazel and ash to grow into tall multi-stemmed forms over a 15 year period, and selecting some oak to grow on as 'standards' would provide a good fuel source, whilst maintaining some landscape and biodiversity continuity in the oaks.

8) Acknowledgments

The project was managed by Samantha Barnes (Tamar Valley AONB Project Officer) and Simon Bates (Cordiale Project Officer). We would like to thank the following people, many of whom gave up their time voluntarily to the project:

Anne Harvey (Benchmark Ecology)
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Faye Davey
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The Tamar Valley AONB team
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And especially all of the volunteer surveyors without whom this project would not have been possible.



The Tamar Valley AONB team would like to dedicate this project to Brian Spencer, one of our volunteers who sadly passed away during the project.

9) Copyright

All text and images © Tamar Valley AONB.

10) References and further reading

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Websites

Cordiale (main website): <http://www.cordialeproject.eu>

Cordiale Toolkit: <http://www.cordialeproject.eu/en/toolkit>

Cordiale Case Stories: <http://www.cordialeproject.eu/en/toolkit/case-stories>

Cordiale Landscape Map: <http://www.cordialeproject.eu/en/landscapes>

Tamar Valley AONB Cordiale webpage: <http://www.tamarvalley.org.uk/projects/cordiale/>

Tamar Valley Calstock Parish Interactive Heritage Map: <http://heritage.tamarvalley.org.uk>

The Hedgerow Regulations 1997 <http://www.legislation.gov.uk/uksi/1997/1160/contents/made>

Defra Hedgeline <http://www.hedgeline.org.uk>

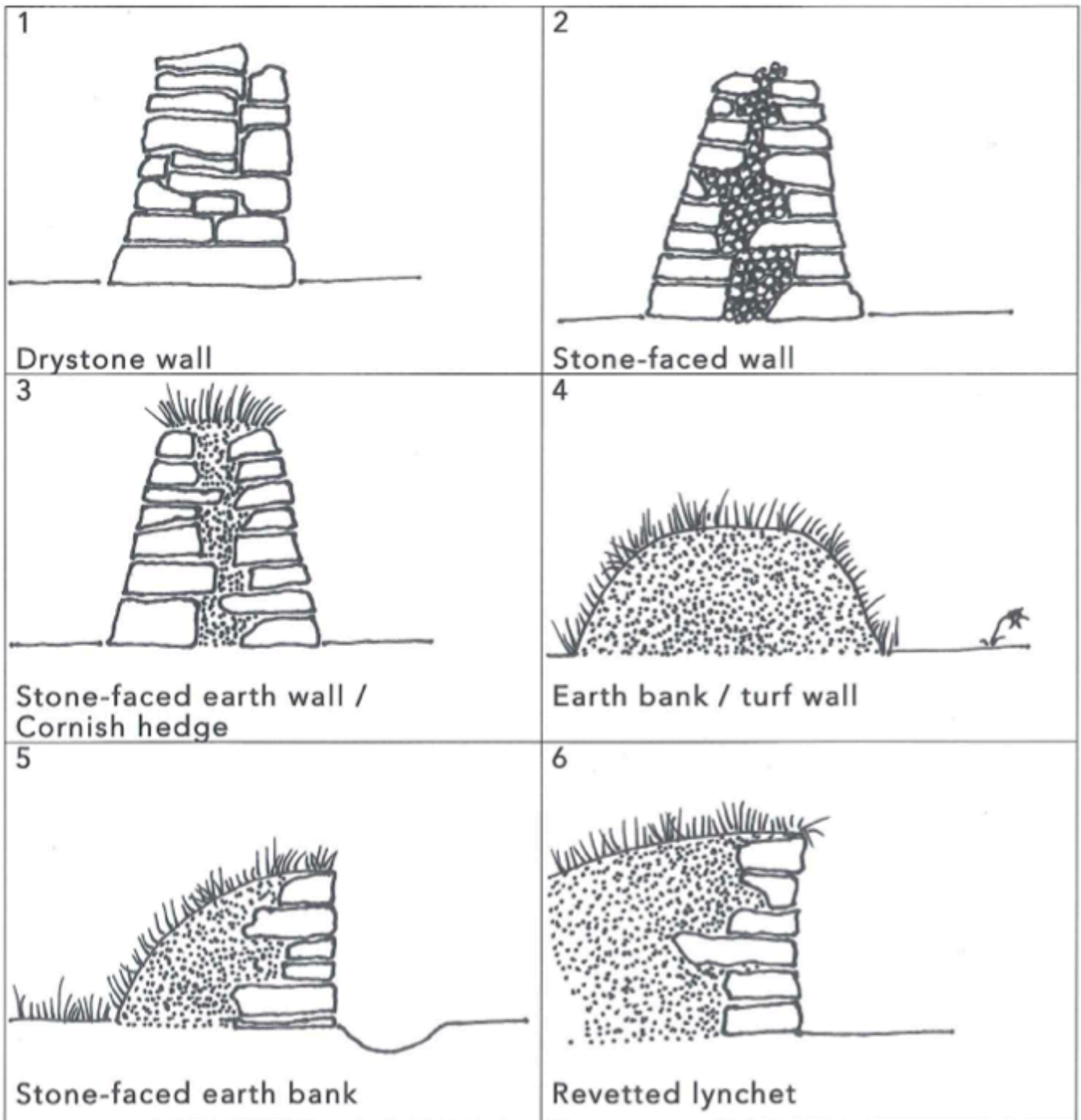
Historic Environment Record for Devon and Cornwall can be accessed through the Heritage Gateway website: <http://www.heritagegateway.org.uk/gateway/chr/default.aspx>

Information on Scheduled Monuments and Listed Buildings, alongside other statutory historic environment designations can be found by searching the National Heritage List for England: <http://www.english-heritage.org.uk/professional/protection/process/national-heritage-list-for-england/>

UK Biodiversity Action Plan <http://jncc.defra.gov.uk/ukbap>

APPENDIX 1

The six hedge boundary types used in the project, after Cornwall Archaeological Unit (1998)



APPENDIX 2

Questions and answers from Survey Monkey volunteer survey (10 respondents)

1) How did you hear about becoming a volunteer hedge surveyor?

Our website: 1
Facebook: 0
Other Internet: 1
Newspaper/magazine: 0
Radio: 0
Word of mouth: 7

2) Why did you sign up to become a volunteer hedge surveyor? Tick all that apply.

To volunteer for the AONB: 4
To meet new people: 4
To learn new skills: 5
To gain knowledge: 6
To contribute to the protection and management of the Tamar Valley landscape: 9

3) If you signed up and/or came to the training day in March 2012, but didn't complete any surveys or be involved in any other way, please explain why.

No responses.

4) Before you undertook the training and started surveying, on a scale of 0-5 (where 0 is none) how did you rate your knowledge of:

	0	1	2	3	4	5
Landscape history/archaeology	2	3	2	1	2	0
Species recognition	0	1	3	5	1	0
Hedge management	4	1	3	2	0	0

5) On a scale of 0-5 (where 0 is none) how would you rate your knowledge now of:

	0	1	2	3	4	5
Landscape history/archaeology	0	0	1	3	5	1
Species recognition	0	0	0	2	8	0
Hedge management	0	1	1	4	4	0

6) On a scale of 0-5 (where 0 is not at all) how useful did you find:

	0	1	2	3	4	5
The initial training sessions	0	0	0	4	4	2
The review sessions	0	0	0	6	3	1
The additional training sessions and events	0	0	1	3	4	2

7) What do you feel were the most and the least useful or fulfilling part of the project?

- Creating general awareness of ancient routes and their evolution. Could not find

enough time to do more surveys. Would like to continue.

- Most - working in partnership with another volunteer and producing some worthwhile results, and meeting new people. Least - where other volunteers could not fulfill their original commitments and some opportunities were lost
- New knowledge gained.
- Going out and doing the surveying
- The practical information and field work
- Field walk most useful. Initially the form and questions seemed extremely daunting
- Most - getting to parts of the Parish not seen before Least - trying to estimate % species cover for wood fuel
- I had never given thought to the use of hedges other than as a barrier to keeping animals contained. I am so much wiser now!
- Most useful seeing and learning plant species and hedge uses least useful lack of co-ordination in our area
- Recognition of ferns

8) What did we do well? And how could we improve?

- Well-presented first lecture and hedge survey at Buckland Abbey. Need more time in this busy world.
- All training events were excellent and visit of ecologist on-site very much appreciated. In addition, a social networking atmosphere was achieved at events and it was obvious many people made new contacts and enjoyed each other's company. Improvement - online submission of data? May not suit all volunteers, though.
- Define the survey more beforehand as the many changes were very confusing.
- Well organised, good people brought in to help out in the beginning.
- I found the initial information confusing, but I think that was probably my fault.
- Instructions for research on the Internet were useful. The form could be improved if made more relevant e.g. only species found in the Tamar Valley were listed
- Very well organised. Could be more emphasis on the value and use of the resulting data.
- The training days were most useful. Making all the maps available was extremely helpful as well.
- Provision of maps slow to start with but feedback and enthusiasm good
- Recognition of species

9) Based on your experience and our organisation of the hedge survey project, will you volunteer in the future for a Tamar Valley AONB project?

Yes: 10

No: 0

10) Finally, please describe your experience of the hedge survey project in three words (e.g. exciting, inspiring, organised).

- Rewarding, Involvement, Surprising
- Fun, learning opportunity, supportive
- Interesting, thought provoking
- Informative, friendly, stimulating
- Hard work! But fulfilling once one realised it was not as difficult as it seemed.
- Educational, organised, exploratory
- Informative, Enlightening, Friendly,
- Informative, interesting, ownership
- Interesting, educational, pleasant