Devon Hedgerow Survey Project

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NATURAL ENGLAND

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FWAG Farming & Wildlife Advisory Group

Contents

Acknowledgements

- Financial support for the project has been provided by Defra's Aggregates Levy Sustainability Fund administered through Natural England;

- Natural England provided list of farm holdings within the parishes concerned and digital maps / aerial photographs for the duration of the project;

- Farmers and landowners granted us permission to survey their hedges throughout the six parishes;

- The Devon Hedge Group have provided guidance and support, thanks in particular to Rob Wolton (Natural England);

- Sir Richard Peek and John Whetman were kind enough to host hedgerow management events;

- The following partner organisations provided representation at the hedge management events:

  North Devon Countryside Service – Tom Hynes
  Devon Hedge Group – Tom Hynes, John Whetman
  Natural England – Mary Ann Walker, Karen Aylward
  Dartmoor National Park Authority – Brian Beasley
  Devon Rural Skills Trust – Sandy Backus

Summary

The project surveyed hedgerows within 6 Devon parishes affected by aggregate extraction (Brayford, Monkleigh, Sourton, Hennock, Brixton and Burlescombe) using the Defra hedge survey methodology between August and November 2007.

- In total 773 hedges were surveyed using the Defra methodology, surveying principally for species richness and condition;
- 63% of surveyed hedges were found to be species rich (containing 5 or more species in a 30 metre stretch). This is above the 42% national average (UK BAP for ancient and/or species-rich hedgerows). This figure would have risen to 68% but for the high percentage of beech hedgerows surveyed in one parish on Exmoor.
- 205 hedgerows (26%) contained 7 or more species in a 30 metre stretch and would automatically be classed as "important" according to the Hedgerows Regulations. The average surveyed hedge contained 5.07 woody species.
- 19% of surveyed hedges are in favourable condition;
- 25% of species rich hedges are in favourable condition;
- Main reasons for unfavourable condition are: small size (low height) of many trimmed hedges (36%), overgrown or gappy hedges (40%) and nutrient enrichment of hedge base (28%);
- Only 1.5% of hedges have received a traditional form of management (coppiced, laid, cast up) over the last 2 years;
- 31% of surveyed hedges would benefit from coppicing/laying by reducing gappiness and restoring growth at the base of the hedge;
- 35% of surveyed hedges would benefit from changes in flail practice by increasing the overall size of the hedge;
- Evidence to suggest that fencing improves hedge and bank condition;
- Evidence to suggest that fencing affects basal floral diversity;
- 487 (70%) hedge banks were classified as being in good condition;
- 36 farmers and landowners, along with local representatives of partner organisations including Natural England attended two awareness raising events;

1 Background

The Devon Hedgerow Survey Project (DHSP) forms part of a national effort to gather data on hedge condition and species diversity contributing to the United Kingdom BAP (BAP) for hedgerows. Similar projects are currently taking place in Cumbria and Warwickshire. It is estimated that Devon has the highest percentage of hedgerows than any other county in the UK and around 25% of the national reserve of species rich hedgerows, resulting in this project being a significant contributor to the national statistics.

The primary objective of the DHSP is to establish the extent and condition of the hedgerow network, and in particular ancient and species-rich hedgerows, at a local level. The assessment will be on a parish basis, with the parishes selected providing representative cover of each joint character area (JCA) within Devon. The survey will therefore also enable an assessment to be made of the status of the hedgerows within a particular JCA, and on a county level.

Devon probably has more species-rich hedges remaining than any other county in the UK. Besides being a BAP habitat in itself, a number of priority BAP species are associated with hedgerows in Devon. These species include the Greater and Lesser horseshoe bats, Brown hare, dormouse, cirl bunting, bullfinch and pearl-bordered fritillary. This makes the distinctive Devon hedge and bank of particular conservation importance. The DHSP therefore is working in an area of particular hedgerow value and will further identify the hedgerows of significant importance.

The Devon BAP identifies ancient and species-rich hedgerows as a priority habitat for conservation and enhancement. Devon FWAG is a key member of the Devon Hedge Group, one of the key bodies responsible for delivering the local action plan. This survey work and the follow up advice and education provided will support the delivery of the Devon hedgerow BAP.

The project has been funded through the Aggregates Levy Sustainability Fund and all surveyed hedges have been within an 8 km radius of an active quarry extraction site. The locations of each have been as evenly dispersed throughout the county to try and include as many of the environmental characteristics / Joint Character Areas present in Devon.

An additional survey of hedgerows in Bradninch parish in mid-Devon was conducted in summer 2007 using separate funding from Defra's funding for Local Hedgerow Surveys.

Two awareness raising events gave the opportunity for landowners and members of the public to learn about the importance of hedgerows for wildlife and their contribution to landscape character. The events were hosted on FWAG farms with contributions from partner organisations.

2 Aims and objectives

The DHSP has had three principal aims; a survey of existing hedgerows, give farmers and landowners guidance on appropriate future management and grant opportunities and raise local community awareness on the value of hedgerows.

Hedgerow survey objectives:

- detailed survey of hedges within 6 parishes surrounding quarry extraction sites using Defra survey protocol;
- A representative survey of Devon hedges by selecting parishes that are spread across the county and are representative of the different JCA landscape types found within Devon;
- contribute to Devon and UK BAP targets for ancient and species rich hedgerows; which are a priority habitat;
- identify hedges requiring additional management to enhance wildlife or local landscape character value.

Hedgerow management objectives:

- produce a brief site specific hedgerow management plan for identified hedges to enhance species diversity and contribute to the local landscape character;
- promote appropriate management/restoration techniques;
- promote the benefits of agri-environment schemes, particularly hedgerow Entry Level Stewardship options to appropriate farmers and landowners.

Community awareness objectives:

- provide feedback on the key findings from the project;
- raise awareness to the local community, landowners and quarry operators about the environmental importance of hedgerows as wildlife corridors and the benefits of adopting appropriate management techniques;d
- promote the wider benefits of sustainable agriculture as a tool for managing and enhancing habitat value in Devon and championing the work of landowners at the local level.

3 Survey methodology

The data collected through the Devon survey will contribute towards a national database on the hedges condition throughout the United Kingdom. Large areas of Cumbria and Warwickshire have been surveyed during 2006/2207 and it is believed that similar projects will commence in other areas of the country in 2008. In order for the data to be comparable all projects have been using the methodology described in the *"Hedgerow Survey Handbook"* (defra 2nd ed 2007).

The late confirmation of project start (end of July) meant a smaller than ideal window for hedge surveying and this meant that some of the voluntary elements of the survey protocol had to be adapted.

3.1 Targeting

As it is not possible to survey all hedges in Devon in a short timescale, a representative sample of 6 parishes have been selected. Alll have been heavily influenced by the quarrying industry and are distributed evenly throughout the county to aim to represent the different landscape types / JCAs .

The selected parishes were:

Parish	Location	Quarry Name	Operation	Operator
Brayford	North Devon District	Bray Valley Quarry	Sandstone extraction	Hanson
Brixton	South Hams District	Moorcroft Quarry	Aggregate extraction	Aggregate Industries
Burlescombe	Mid Devon District	Westleigh Quarry	Limestone extraction	Aggregate Industries
Hennock	Teignbridge District	Trusham Quarry	Dolerite extraction	Hanson
Monkleigh	Torridge District	Beam Quarry	Sandstone extraction	Torrington Stone Ltd
Sourton	West Devon District	Meldon Quarry	Aggregates extraction	Aggregate Industries

Table 1.1, location of surveyed parishes with quarry details

Bray Valley Quarry– Brayford

A map showing the location of the surveyed parishes is included in Appendix 3.

3.2 Identifying hedges and landowners

The Defra protocol for conducting a random sample survey suggests using a hedge density of 9hedges/km². This was achieved by dividing the 1 km² grids on an Ordinance Survey map into 333 m² blocks, the hedge closest to the centre of each block was then selected for surveying (full details are described in the Defra Hedgerow Survey Handbook 2nd ed). This process was carried out for each of the 6 parishes with maps being produced for each with each hedge selected being issued with a unique identification code. Hedges located in urban areas or along residential buildings were omitted from the survey.

Natural England kindly provided a list of all RLR (Rural Land Registered) holdings in each parish which formed the basis of the project awareness campaign. Landowners were sent an initial letter (appendix 2) explaining the project followed up with a phone call to arrange a suitable survey date.

The project was initially met with scepticism from some landowners, particularly in Brayford and Sourton. In many cases the landowners were happy for FWAG to look at the hedges but were unsure about the details being loaded onto a national database, it was felt that it would be used against them in the future. Due to a number of rejections over the telephone it was felt that a 'face to face' approach from a FWAG staff member would yield better results. A number of FWAG members offered their holdings for the project and also encouraged their neighbours to be involved.

In parishes where a number of landowners denied access, holdings outside the parish boundary were contacted and surveyed. The details of these additional farms were primarily gained on referral from previously surveyed landowners who felt they would like to be involved in the project. It was necessary that these farms were surveyed in order to maintain sample numbers, enable meaningful comparison between parishes and give an accurate representation of hedges in the area. Although the additional holdings are outside the selected parish boundary they are all within an 8 km radius of the quarry site.

Parish	**Number of holdings**
Brayford	18
Brixton	11
Burlescombe	9
Hennock	16
Monkleigh	12
Sourton	11
Total	**77**

Table 1.2, number of surveyed holdings per parish

As shown in table 1.2, 77 holdings took part in the survey.

The planned development of an urban village in Brixton resulted in a large area that could not be surveyed. Many of the affected hedges were previously assessed through the planning stage of the development and were scheduled for removal, it was felt including them in the project would not be worthwhile. In this case the survey area was migrated eastwards into Yealmpton parish to make up sample numbers.
The problems in gaining access onto holdings were exacerbated during September and October 2007 due to the Foot and Mouth outbreaks in the South East of the country. FWAG placed a two week precautionary staff restriction on farm visits during these periods. Many holdings that were booked in for surveying decided to postpone visits until the 4 week surveillance period had been met and others cancelled entirely, this was exacerbated further by the Bluetongue outbreak.

3.3 Field survey

The survey method stated in the Defra Hedgerow Survey Handbook 2nd ed was followed with compulsory section A being completed and adaptations made to non-compulsory section B. The decision to make the adaptations were made after survey staff attended a Defra led training session during July 2007 and it was suggested that it would not be possible to complete all original elements within the project timeframe. An additional staff training session was organised on a FWAG committee member's farm to trial the new survey form including adaptations.

All selected hedges were surveyed over a 30 m stretch on both sides. In some cases it was not possible to survey both sides of the hedge due to accessibility being denied from neighbours or being unable to make contact at time of survey. In some cases it was not possible to assess side B due to physical or safety factors.

Through consultation with an ecologist it was decided to omit the ground flora element from the survey as many of the indicator species would not be present during the autumn survey period. It would also not have been possible to conduct a full 2 m² quadrate survey of every hedge in the time period. This element was replaced by a basic assessment of species diversity in the form of low, medium and high. Although not scientifically accurate it gives an indication as to the general diversity of the hedge base.

In order to give appropriate feedback to the landowners a section on future management was included on the survey form in part B.

Section A of the form was adapted in order for it to fit on three sides of A4 which ultimately saved paper wastage and reduced costs. All elements were still included but could be added onto the electronic database at time of entry. Information on hedge length and grid reference was obtained from digital maps in the FWAG office supplied by Natural England.

A copy of the adapted survey form used during the survey can be found in appendix 2.

Surveying commenced in August 2007 in Brixton, Burlescombe and Sourton with Hennock, Monkleigh and Brayford starting September. The foot and mouth

outbreaks in September prevented surveying for two weeks which was then followed by another outbreak in October causing further delays. Surveying in Brixton, Sourton and Burlescombe was stopped at the end of October due to the beginning of shooting season; a number of small holdings were accessed in November to increase hedge numbers. Surveying was completed in the three remaining parishes in mid November.

Table 1.3 details the total number of hedges surveyed in each parish.

Parish	**Hedges Surveyed**
Brayford	159
Brixton	128
Burlescombe	114
Hennock	119
Monkleigh	132
Sourton	121
Total	**773**

Table 1.3, number of surveyed hedges per parish

In total 773 hedges were surveyed across the six parishes by the end of the season. This figure is below the desired value but still gives a good representative sample of the parishes and of Devon as a whole.

3.4 Recording

The completed survey forms have been entered onto a Defra designed Microsoft Access database for collation and analysis (with corresponding changes made to section B of the survey form). Information stored on the database was transferred into a Microsoft Excel spreadsheet and used with ESRI ArcMap digital mapping programme (examples are shown in appendix 3).

The database will be sent back to Defra for further analysis and inclusion in the national statistics.

4. Survey results and discussion

The results in this section have been obtained from the 773 hedges surveyed in the 6 Devon parishes and uses data collected from hedgerow side A unless otherwise stated.

4.1 Adjacent land use

Parish	Cultivated Arable	Uncultivated Arable	Improved Grassland	Semi Imp Grassland	Un Imp Grassland	Major Road	Minor Road	Track
Brayford	2	2	87	36	10	1	16	7
Brixton	61	4	33	18	0	0	8	1
Burlescombe	13	4	71	12	0	3	9	2
Hennock	15	0	57	21	2	0	16	3
Monkleigh	21	7	84	3	0	1	11	4
Sourton	1	0	106	3	4	1	4	2
Total	**113**	**17**	**438**	**93**	**16**	**6**	**64**	**16**

Table 2.1, description of land cover on side A.

The majority of hedges surveyed were bordering intensive grassland. This is as would be expected as Devon is predominantly a livestock rearing county. Brixton had the highest number of arable fields in the survey area and Brayford had the largest amount of unimproved grassland.

4.2 Hedgerow Structure

Parish	Shrubby	Line of Trees	Shrubby with Line of Trees
Brayford	94	30	32
Brixton	97	6	24
Burlescombe	105	2	7
Hennock	87	16	16
Monkleigh	124	2	6
Sourton	102	10	9
Total	**609**	**68**	**94**

Table 2.2, description of hedge structure per parish

The full description for each of the structure categories is described in the Defra *"Hedgerow Survey Handbook"* (defra 2nd ed 2007).

The 'shrubby' hedges form by far the majority of the hedgerows surveyed and these hedges generally receive a form of management on a regular basis which would usually be indicative of a regular flail trimming routine (although this may not be applied to the whole hedge, many of the hedges in Brayford had been sided but not topped) . The hedges defined as 'line of trees' have generally received little or no management for many years and have developed into a mature hedge with no shrubby base – just under half of the hedges within this category are located in Brayford. The

remaining hedges have also developed into a line of trees but they retain a shrubby component at the base.

4.3 Species richness

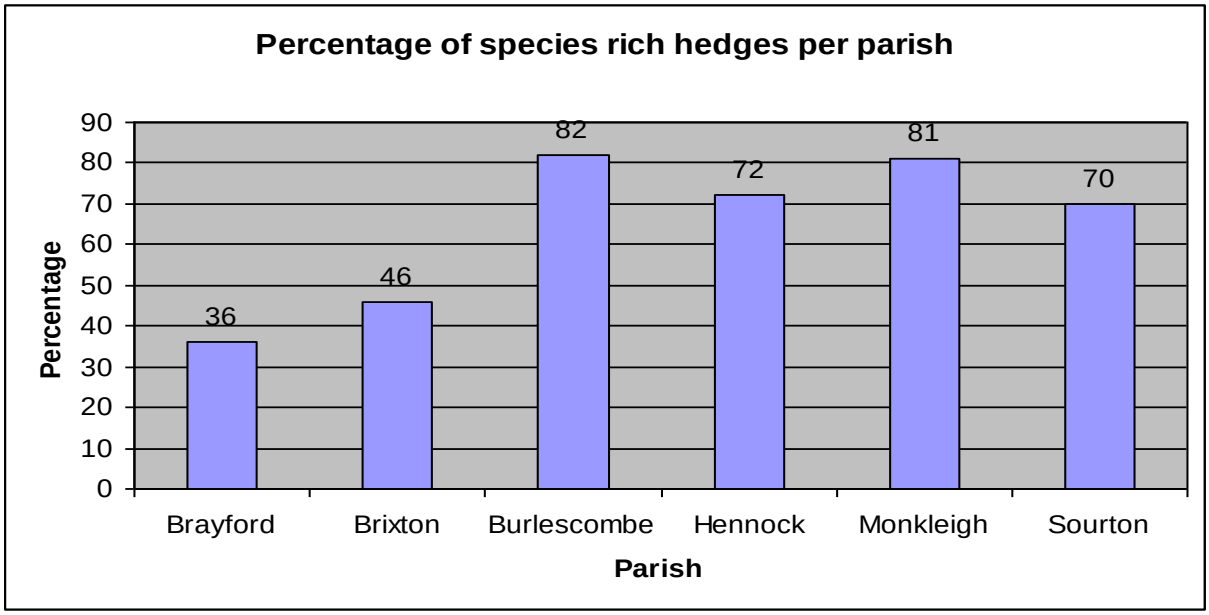
The Defra protocol defines a species rich hedge as one which contains 5 or more native or archaeophyte woody species per 30 m length not including climbers (other than roses) or brambles.

Using Hoopers Law it is possible to estimate the age of the hedge, with every individual species found within a hedge representing 100 years of age. Although this theory has largely been discredited in recent years it can still be used for a rough guide or anecdotal evidence. The number of species found within a 30 m stretch is also used in The Hedgerows Regulations Act 1997 for determining an "important" hedge, any containing over 7 species/30m are automatically classified as important.

A total of 38 woody species were found in the 773 surveyed hedges which are listed in full in appendix 2. The species maps for each parish in appendix 3 identify the locations of more interesting hedge species.

From the 773 hedges surveyed:

- 488 can be described as being species rich (63%)
- 205 (26%) contained 7 or more species and would automatically be classed as "important" according to the Hedgerows Regulations
- 2 hedges had the highest diversity of 11 species/30m
- 118 hedges fell just below the species rich threshold with 4 species
- 5.07 species/30 m is the average number of species found in all surveyed hedges
- 6.38 species/30m is the average number of species found within species rich hedges

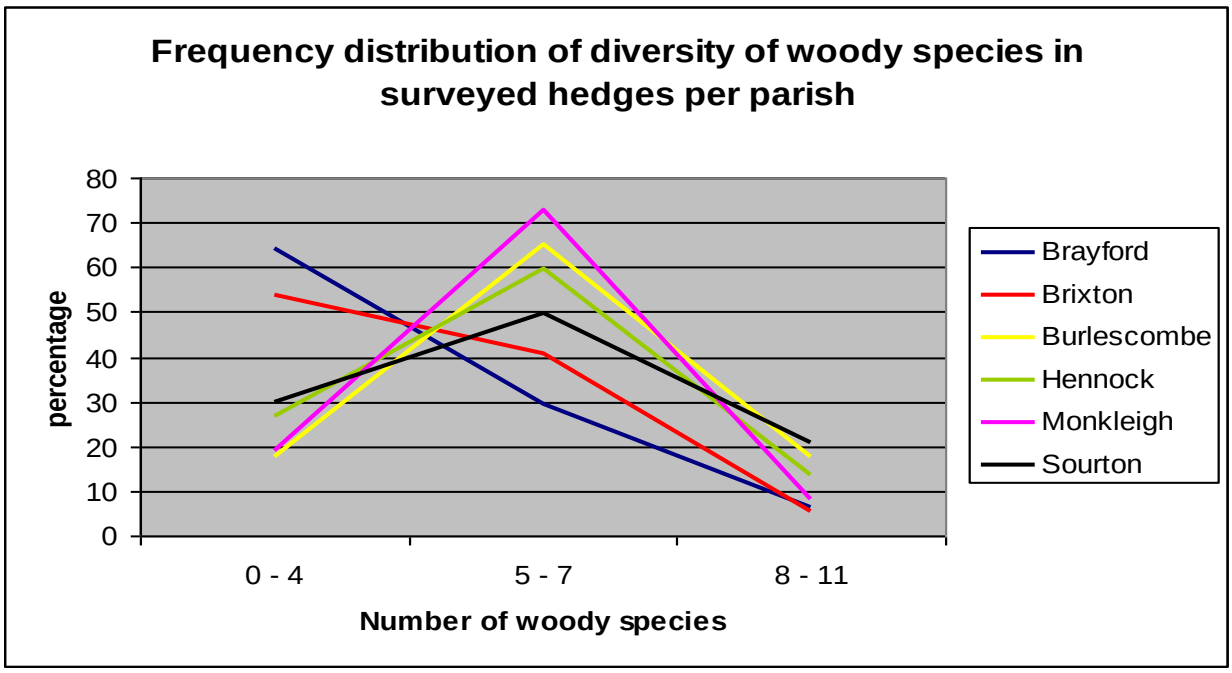


Graph 2.1, percentage of species rich hedges/parish

As shown in graph 2.1, Burlescombe and Monkleigh had the highest percentage of species rich hedges at 82% and 81% respectively. Brayford and Brixton had the lowest percentage of 36% and 46% respectively. The low figure for Brayford is explained by the high numbers of Exmoor beech hedges in this parish.

The percentage of species rich hedges across the whole survey area has been calculated at 63%, although this is above the national figure of 42% (UKBAP for Hedgerows) it is less than was expected. If Brayford were to be removed from the survey the overall percentage of species hedges surveyed would be 68.4%.

The maps found in appendix 3 show the distribution of species rich hedges per parish.



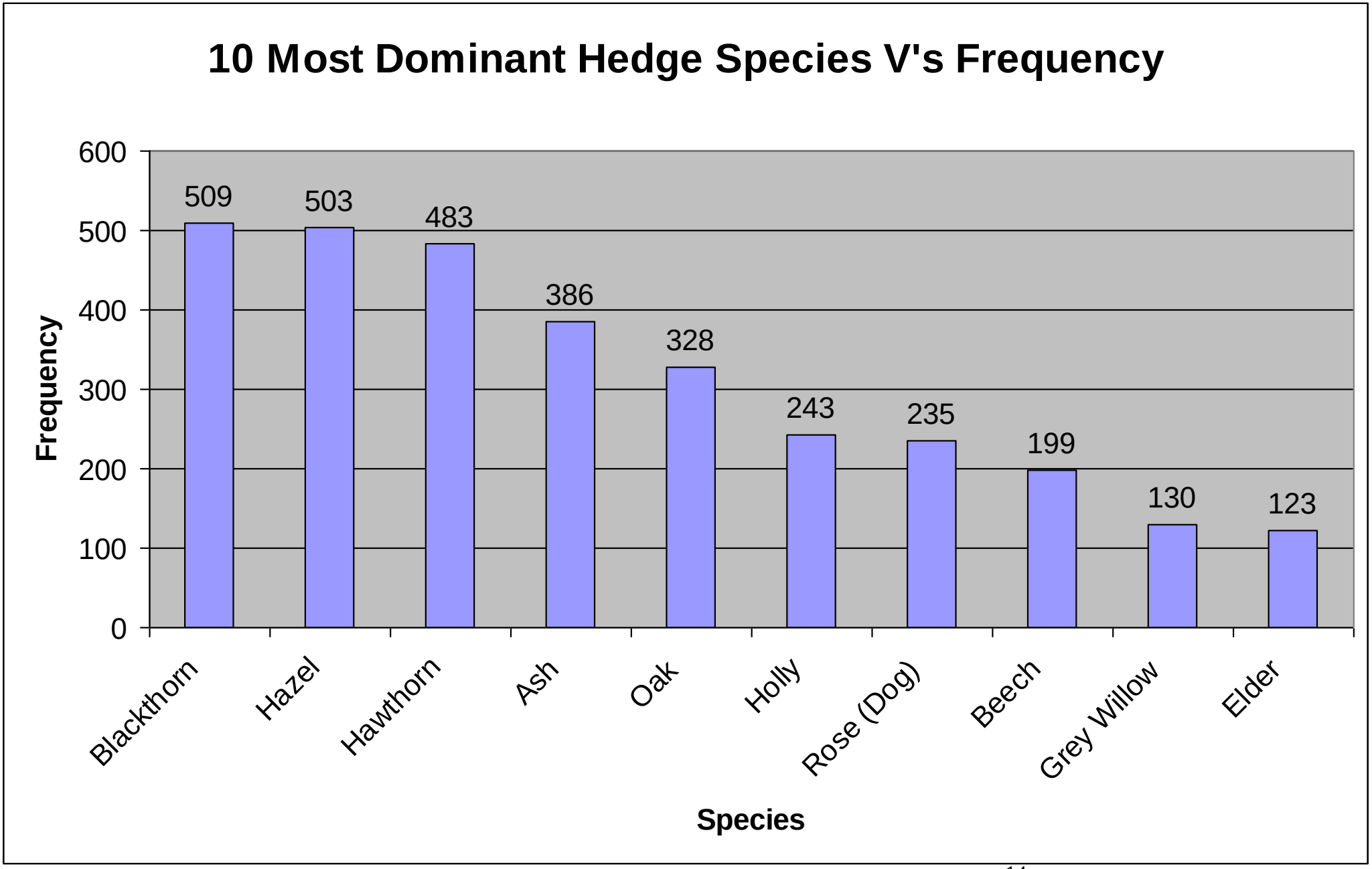
Graph 2.2, frequency of hedges within species count bands.

Graph 2.2 shows the distribution of hedges per parish within each species count category. Over 70% of the hedges in Monkleigh contained between 5 – 7 species and less than 10 % contained more than 8 species. Sourton had the highest percentage of hedges containing 8 – 11 species at 21% and Brixton the lowest with 7%.

4.4 Species composition

Graph 2.3 (page 13) describes the ten most common hedge species in the survey area. As shown Blackthorn, Hazel and Hawthorn are the three most common species and have been found in over 62% of hedges. More 'interesting' species including spindle, uilder-rose, hornbeam, sweet chestnut, whitebeam and crab apple were also found across the six parishes. As an example of these spindle was found in 67 (9%) hedges, particularly in Brixton and Hennock.

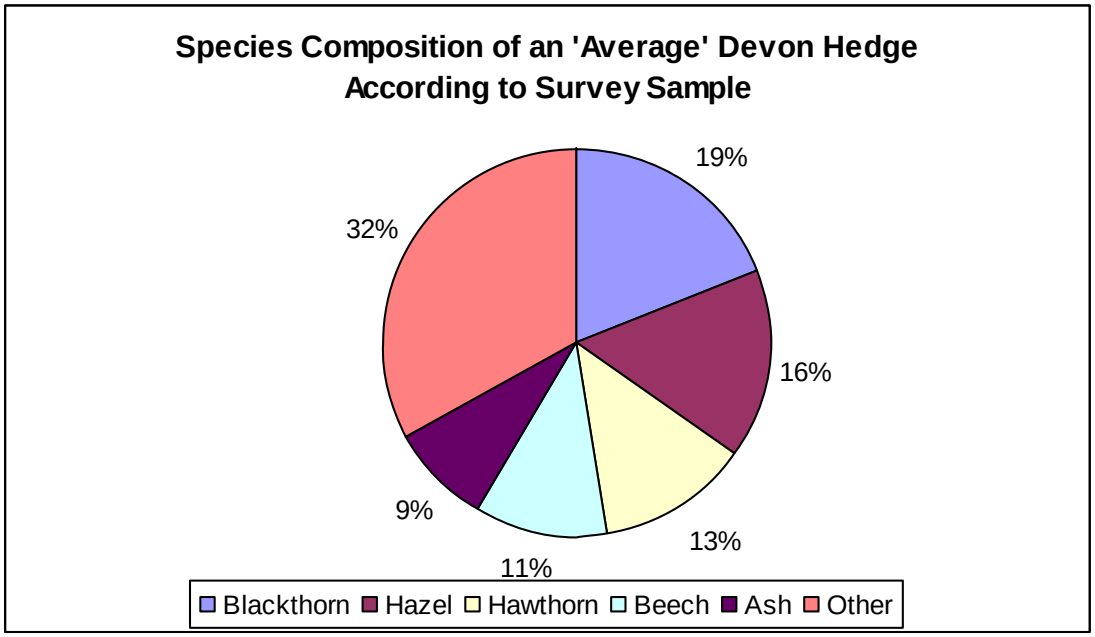
The table in appendix 2 shows the total breakdown of all woody species recorded.



Graph 2.3, 10 most frequent species in the survey area

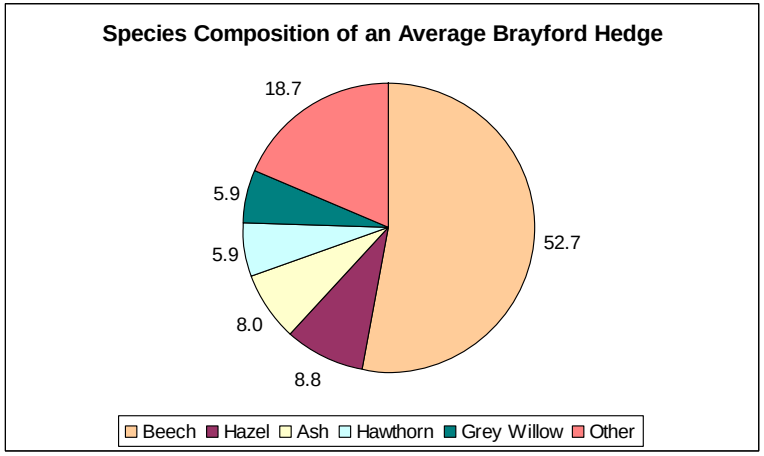
In addition to species count the survey gathered information on percentage of species cover across the 30m survey length. This has been used to construct a species composition list for the top five most dominant species within each parish as shown in graphs 2.4 – 2.9 (following page)

Blackthorn, hawthorn and hazel are the three most dominant species in all but two of the parishes, Brixton where ash is third and Brayford where beech has a 52% majority. The dominance of beech in Brayford allowed it to be included in the 'average Devon hedge' as shown in graph 2.10. Sourton had the second highest proportion of Beech at 6.2%, predominantly found in hedges on the edges of Dartmoor. Sycamore is present in all parishes but only contributes 1.9% to the average Devon hedge, Brixton and Burlescombe have the highest percentage of Sycamore at 2.5%.

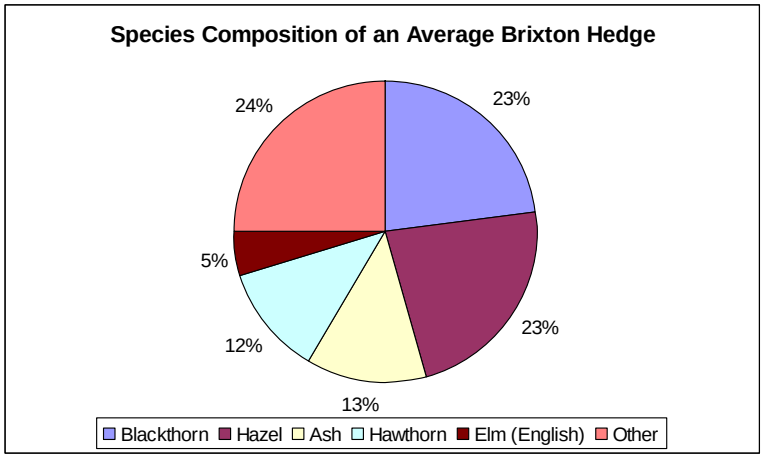


Graph 2.10, 5 most dominant species by cover for the average Devon hedge (according to survey results)

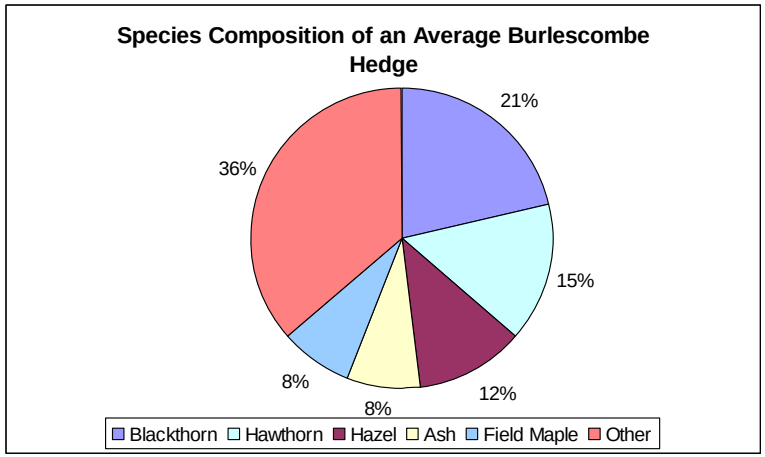
The graphs over the page can also be used as a rough guide to the diversity of species within each parish by the size of the 'other' category. As shown 36% of Burlescombe hedges and 34% of Sourton hedges comprise of species below 8% dominance.



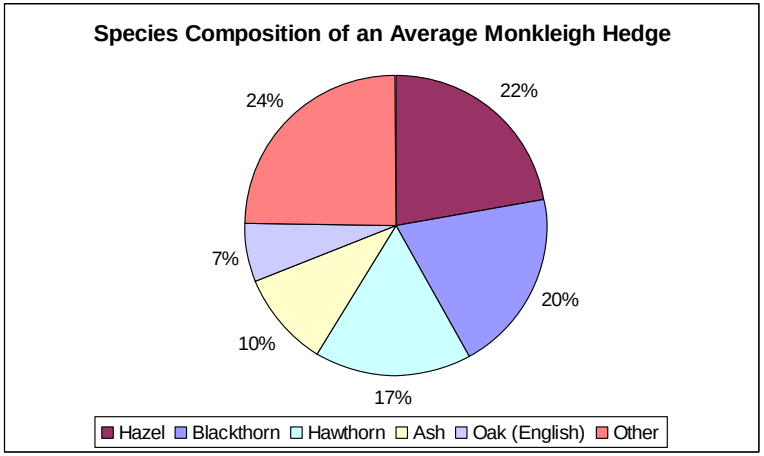
Graph 2.4, Percentage cover of species within an average Brayford



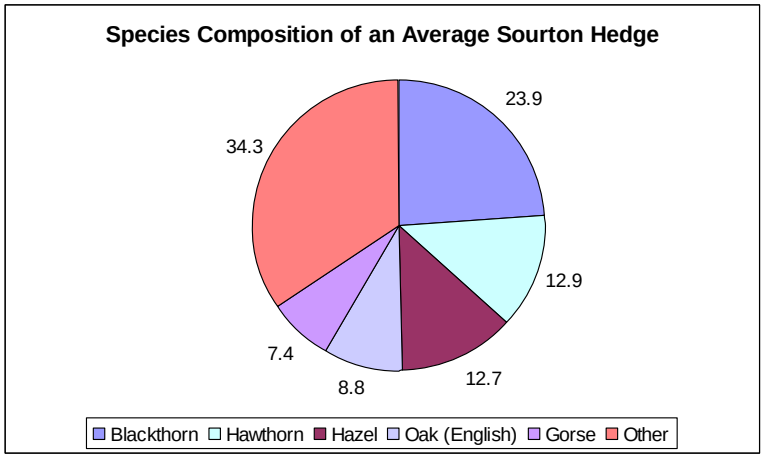
Graph 2.5, Percentage cover of species within an average Brixton hedge



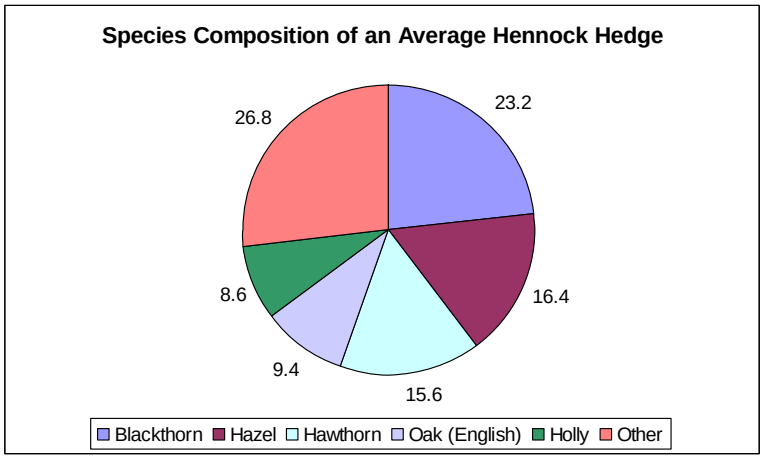
Graph 2.6, Percentage cover of species within an average Burlescombe hedge



Graph 2.7, Percentage cover of species within an average Monkleigh hedge



Graph 2.8, Percentage cover of species within an average Sourton hedge



Graph 2.9, Percentage cover of species within an average Hennock hedge

4.5 Condition assessment

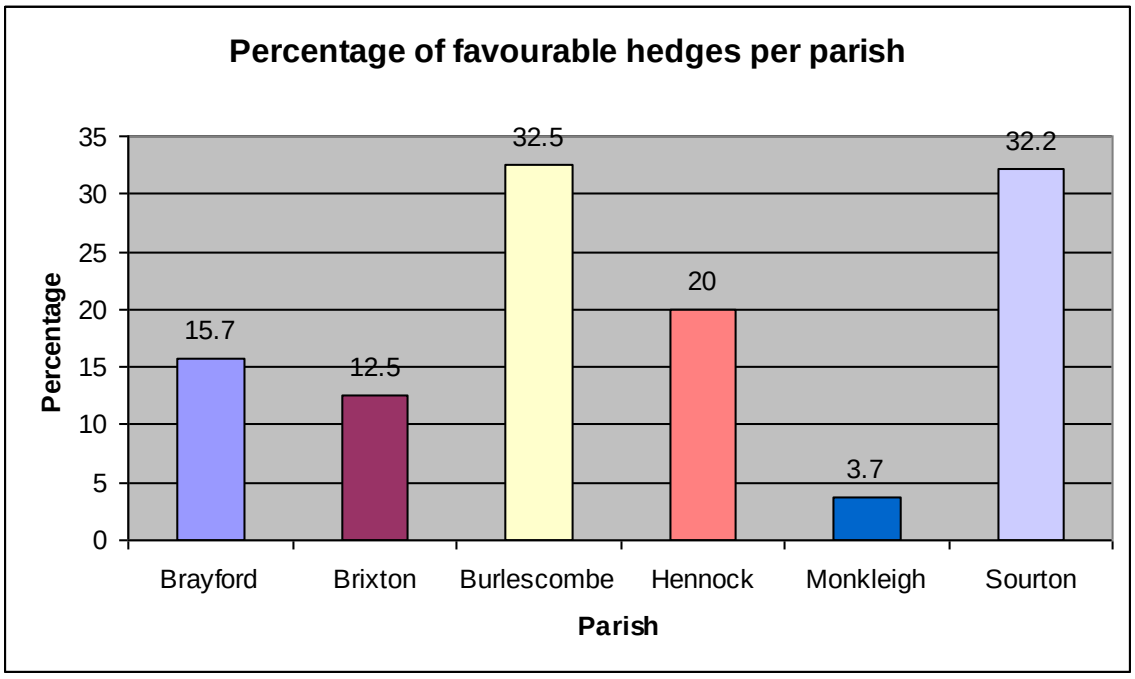
The *"Hedgerow Survey Handbook"* (defra 2nd ed 2007) details 5 thresholds that have to be met to classify a hedgerow as in favourable condition.

- **Undisturbed ground and perennial herbaceous vegetation cover:** at least 2m of undisturbed ground and 1m of herbaceous vegetation cover from the hedge centre line.
- **Nutrient enrichment:** less then 20% cover combined of nettles, cleavers and docks.
- **Recently introduced non native species:** Non native herbaceous species (maximum 10%), non native woody species (maximum 10%).
- **Size:** at least 1m high, at least 1.5m wide, at least 3m² cross-sectional area.
- **Integrity/continuity:** less than 10% gaps, no gaps greater than 5m, base of canopy less than 0.5m above ground.

Very few surveyed hedges contained any evidence of non native species allowing this threshold to be effectively discounted from the condition assessment.

In total 147 (19%) of the 773 surveyed hedges were found to be in favourable condition from the four remaining thresholds.

Graph 2.11, percentage of favourable hedges per parish



Graph 2.11 describes the percentage of surveyed hedges per parish that are in favourable condition. As shown Burlescombe and Sourton have the highest percentage of favourable hedges and Monkleigh the lowest. The hedge condition maps in appendix 3 show which hedges have failed on a number of condition thresholds, again Monkleigh shows the greatest proportion of hedges failing on two and three categories. Brixton shows the greatest diversity of hedge condition as 12.5%

are favourable but there are more hedges failing on all four thresholds than any other parish.

Table 2.3 shows how many hedges within each parish are failing the individual condition thresholds. The two most common causes for hedges failing to be favourable in the survey area is due to size and integrity/continuity

Parish	Undisturbed ground	Nutrient enrichment	Size	Integrity/continuity
Brayford	4	35	31	102
Brixton	49	61	61	53
Burlescombe	13	39	35	26
Hennock	14	11	49	45
Monkleigh	30	48	71	40
Sourton	0	26	32	47
Total	110	220	279	313

Table 2.3, breakdown of hedges failing each condition assessment per parish

The large number of hedges failing integrity/continuity is mainly due to base of canopy being above 0.5m, particularly in Brayford where there are a number of mature beech hedges. Laying or coppicing would improve gappiness and significantly reduce the height of canopy to within the threshold limit. It is important to note that estimating the height of canopy can be difficult on some Devon hedge banks and there is potential for it to become subjective to the surveyor.

Hedge size is a particular issue in Brixton and Monkleigh where hedges are prevented from increasing above 3m² by the practice of tight annual flailing. Encouraging the flail height to be increased steadily over a number of years would have a positive impact on hedge condition

Brixton and Monkleigh both have the highest numbers of hedges failing undisturbed ground, nutrient enrichment and size. This may be due to the higher proportion of arable ground in these parishes and the associated farm management techniques used. It has been difficult to show a strong link between arable and hedge condition within this survey as the parishes have been predominantly grassland areas.

Nutrient enrichment is an optional part of the condition assessment and a number of other surveys have omitted it from their results. For the purpose of this report the decision was taken to include this element as it gives an indication to the diversity of the hedge bottom and also an insight into the management of surrounding land. Nutrient enrichment was found to be a significant factor affecting hedgerow condition. Future surveys may observe a drop in the number of hedges failing nutrient enrichment due to Cross Compliance regulations on establishment of buffer strips 2m from hedge centre. In many cases Devon hedges are wide enough to meet this requirement without additional buffer strip adjacent to hedge base.

4.6 Management

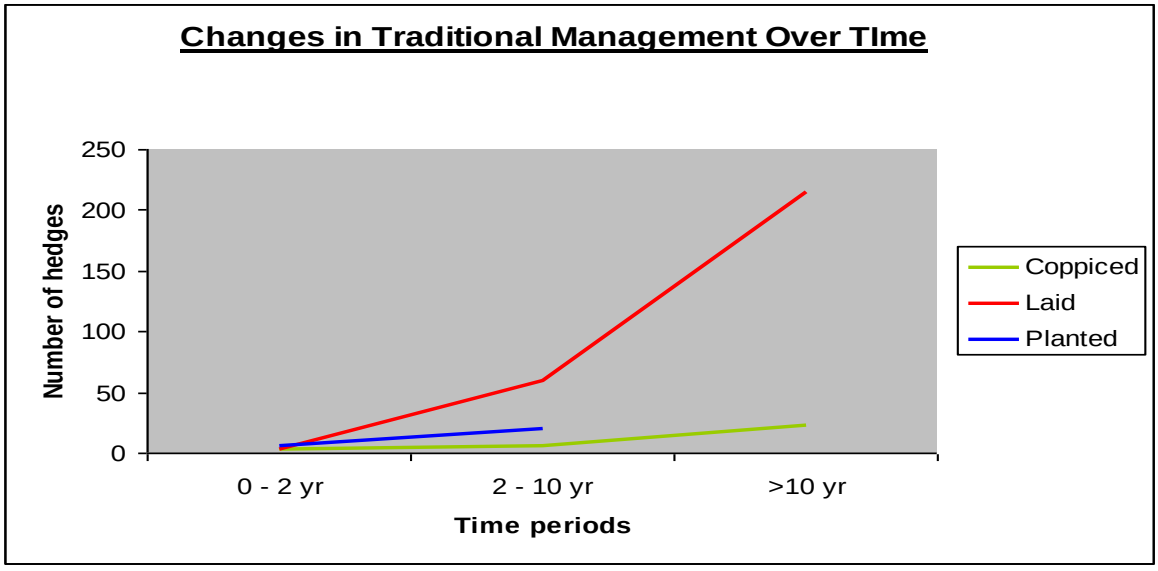
The survey has identified whether hedge management has occurred over 3 time scales, within the last 0-2 years, 2 – 10 years and >10 years. In cases where the type of hedge management has not been possible to identify then the option for NONE was selected. This is particularly prevalent for >10 year management on wide hedges where the base has been obscured by outgrowth. It is not possible to accurately identify flailing over 10 years old and so has been omitted from this section.

	0 – 2 yr	2 - 10 yr	>10 yr
Flailed	512	355	
Coppiced	3	6	22
Laid	3	60	215
(re) Planted	6	20	0
None	249	332	536

Table 2.7, changes in hedge management over time

Flailing has been shown to be the most common form of hedge management in the survey area over the 0 – 2 year and 2 – 10 year ranges. The number of hedges showing signs of NO management increases steadily over time due to the difficulties described above.

Graph 2.12, shows the changes in traditional hedge management (coppicing and laying) over the 3 timescales in the survey area.



Graph 2.12, changes in traditional hedge management over time

The graph shows a significant reduction in the use of traditional hedge management techniques in the survey area over recent years with only 1.5% of hedges in the last 0 – 2 year period, particularly for laying. It is believed that this graph also represents the fall in availability of grants for traditional hedgerow management for farmers and landowners in recent years due to the changes in 2005 from classic agri-environment schemes to Environmental Stewardship. Many holdings in the survey area are currently not in a position to apply for HLS (High Level Stewardship) which is the only form of grant funding (outside of local area projects). It was noted during the survey process that many farmers who have finished CSS (Countryside Stewardship

Scheme) or ESA (Environmentally Sensitive Area) agreement would like to continue laying their hedges but are unable to as they will not qualify for HLS. The cost of traditional management is seen as too great without some form of grant funding.

4.7 Bank condition and fencing

Condition of the hedgebank was also rated as A, B or C, with A being good condition. Banks can deteriorate through slumping, lack of fencing and stock ranching. Stone banks lose their stonework over time. 487 (70%) of the hedge banks surveyed were classified as condition A. This is a surprisingly high figure.

Presence or absence of fencing alongside the hedgerow was also recorded.

Table 2.4 details hedge bank condition on side A with the associated management techniques used. The results indicate that fencing has a slight positive effect on bank condition in the survey area as 48.4 % of those in condition A are fenced apposed to 33% for the none category. Fencing can prevent stock from excessively eroding the bank, particularly cattle; sheep also have a tendency to climb onto the bank for shelter when there is no fencing.

	Condition A	**Condition B**	**Condition C**	**Total**
None	161	53	34	**248**
Fenced	238	65	17	**320**
Grazed	37	13	6	**56**
Mown/Cut	51	12	2	**65**
Total	**487**	**143**	**59**	**689**

Table 2.,4 bank condition with associated management

Table 2.5 describes the number of hedges that passed each condition threshold and the quantity that were fenced along side A. 409 (53%) of the 773 surveyed hedges had some form of fencing along side A, 83 (20%) of those were both fenced and in favourable condition.

	Undisturbed ground	**Nutrient enrichment**	**Size**	**Integrity/continuity**
# hedges passed	663	553	494	460
# fenced hedges	380	313	280	267
Percentage	57.3	56.6	56.7	58.0

Table 2,5 number of hedges passing each condition assessment against number of fenced hedges

The percentages would suggest that there is a slight positive correlation between fencing and hedge condition but it is not strong enough to be conclusive. It has been noted that this survey did not distinguish between the different styles of fencing which may have produced more conclusive evidence.

Fencing can have a negative impact on flora if there is no management in the form of mowing to control dominant grasses that swamp smaller flowers. Sheep are often able

to graze the hedge bottom through 2 strand barbed wire and can often be beneficial to flora if over grazing is prevented. It was noticed in Brayford that 2 strand 'jump fences' were often used on stone faced banks which allowed sheep to graze tightly to the bank but were unable to browse the hedge or affect its structure. Many of these hedges showed a slightly higher diversity of basal flora than otherwise would have been expected. This style of fencing may not be suitable on earth banks which are susceptible to stock erosion.

Table 2.6, shows the percentage of hedges within each basal floral diversity category for fenced and non fenced.

	Low diversity	**Medium diversity**	**High diversity**
Fenced	45.9 %	48.4 %	5.6 %
Not Fenced	50.5 %	41.4 %	8.5 %

Table 2.,6 basal floral diversity against fenced hedges

The results from this survey would suggest that fencing hedgerows has little effect on the floral diversity of the hedge bottom. The percentages within the fenced and non fenced categories are within 10% of each other for low and medium diversity and within 3% for high diversity. Again, future surveys identifying the different types of fencing may be able to provide more substantial results.

5 Hedgerow management advice

It was important that any feedback given to the farmers and landowners not only provided information on the survey results but also gave advice on the individual hedges on their holding.

5.1 On-site advice

At the time of field survey, surveyors had face-to-face discussions with the farmer / landowner as to hedgerow management techniques employed and advice given as to appropriate management for individual hedges and the farm as a whole. A number of farmers and landowners were interested to find out more and prepared to accompany the surveyor during the survey, and this enabled a great deal of beneficial discussion.

An important part of the discussion centred around the uptake or otherwise of an agri-environment agreement such as Countryside Stewardship, Environmentally Sensitive Areas or Environmental Stewardship. For those that were eligible for Entry Level Stewardship (ELS) but had not joined, time was taken to explain the scheme with particular attention to the benefits of selecting hedge options. In a number of cases landowners who were not familiar with the application procedure or were experiencing problems in gaining points were able to join after a short conversation with the surveyor.

5.2 Farm hedgerow management plans

A basic site management plan was constructed using aerial photographs provided by Natural England for each of the participating holdings. It was not possible to survey and include every hedge on the farm, so those that were surveyed for the Defra protocol survey were covered as a representation of the hedgerows on the farm. The plan identified which hedges had been surveyed, those that were species rich and recommended future management. An example is shown in appendix 1.

For selecting the most appropriate management option the hedge was not only assessed on its current condition but also how it fitted into the landscape and the quality of habitat it provided, now and in the future. The ideal is to create a mosaic of different hedge structures and sizes across the farm to establish a range of habitat types.

The seven management options included in section B of the survey forms were condensed into three, **M**aintain, **E**nhance and **R**estore; the description for each is printed on the reverse of the map (see appendix 1). As there are many different thoughts on best practice for hedge management it was felt that only giving three options would keep the map concise and encourage the landowner to seek additional advice on individual hedges.

A full list of the species found in each holding with a composition for an average hedge was also provided to each landowner in a covering letter. It was felt that this information would be useful for any future hedge planting or restoration work taking place (appendix 1).

6 Community awareness-raising / demonstration events

Three events were organised during March 2008 in Brayford, Brixton and Hennock. Over 500 landowners had been contacted through the post and adverts had been posted on well known environmental websites for public attention. The events had been marketed as an opportunity for anyone with an interest in hedges to learn of the survey results and see examples of laying and coppicing first hand. Farmers also had the opportunity to hear about available grants from a Natural England representative (an example of the flier is included in appendix 1). Representatives from local quarry operators were individually invited to the events**.**

Good weather preceding the Brixton event resulted in it being cancelled due to poor numbers; those already booked on were transferred to the later Hennock event. In total 36 landowners and members of the public attended the two events (itineraries from both events have been included in appendix 1).

Speakers included:

Tom Hynes – North Devon Coast and Countryside Service, Devon Hedge Group
Mary Ann Walker – Natural England Project Officer
Sir Richard Peek – Landowner
Roland Stonex – Farming and Wildlife Advisory Group
Brain Beasley – Dartmoor National Park Authority
Karen Aylward – Natural England Project Officer
Sandy Backus – Devon Rural Skills Trust
John Whetman – Landowner, Devon Hedge Group
Craig Hodgson – Farming and Wildlife Advisory Group

Both events were rated highly by attendees due to the wide range of speakers and the opportunity to see examples of good and bad hedge management during the farm walk. It was particularly beneficial having a local Natural England project officer who could answer questions regarding grant funding and alleviate some of the scepticism surrounding Environmental Stewardship.

6. 1 Brayford Event 6th March 2008, Wallover Barton, Bratton Fleming

Results from the hedgerow survey being passed back to landowners and attendees at the Brayford event.

Discussion on the practicalities of restoring outgrown hedges

Example being shown of a newly laid hedge

Results from hedgerow survey project given to 19 attendees at the Hennock

Introduction to Deer Park Farm by John Whetman

An example of a year old laid hedge being shown to attendees

7 Key points to take forward

- ✓ **High proportion of species-rich hedges.**
  It was known before the survey that Devon held a high proportion of species-rich hedgerows, but now there is some objective evidence to back up this claim. 63% of surveyed hedges have been found to be species rich with 26% containing 7 or more species. This figure is above the 42% national average as quoted in the United Kingdom BAP for Hedgerows.

- × **Majority of hedges are in unfavourable condition**
  Only 25% of the species-rich hedges surveyed were in favourable condition and 19% of all surveyed hedges are in favourable condition. 'size' and 'base of canopy' have been significant contributors to poor condition.

- × **Low uptake of good hedge trimming practice**
  Changes to flail techniques would have a considerable affect on reducing the number of hedges failing on size (over 35% of hedges sampled), particularly increasing the height progressively over a number of years. Encouraging and advising farmers and landowners to choose hedge options such as biannual trimming in an ELS application may be one method of achieving this.

- × **Low levels of traditional hedgerow management / availability of grant**
  The survey shows that traditional hedge management such as coppicing and laying has fallen from favour in recent years to a state where only 1.5% of surveyed hedges have been laid/coppiced in the last 0-2 years. This is likely to be due to high levels of labour intensity and economic pressures, and also the inaccessibility of capital grants for the vast majority of commercial farmers in Devon has exacerbated the situation. Landowner feedback at the time of surveying and during the promotional events suggests that many farmers would like to continue laying hedges but are unable to make it economically viable without some form of grant aid. It is felt that reintroduction of laying/coppicing could have a positive impact in improving hedge condition by reducing canopy height, reducing gaps and increasing hedge lifespan.

- × **Many hedges suffer from nutrient enrichment at their base**
  Despite introduction of Cross Compliance buffer strips, nearly 30% of the hedgerows sampled suffer from nutrient enrichment evidenced by coarse aggressive weed species which can swamp native flora. There is a need for provision of advice to farmers and landowners on appropriate field edge management.

7.1 Potential further work

A number of areas of further work have come to light during the survey project:

- Undertake comparison of hedgerow condition vs farm types and uptake of agri-environment scheme hedgerow options;

- Provide advice and incentives to farmers and landowners to address poor hedgerow condition (see above);

- Defra survey methodology in general does not deal well with hedges that are situated on banks as is the case in Devon – special modules could be developed for embanked hedges;

- There needs to be some way of determining 'degrees of favourability' of a hedgerow – at the moment a hedge that fails one condition assessment has the same status as one that fails four condition assessments;

- Unify Defra hedgerow survey protocol, Farm Environment Plan condition assessment and determination of 'important' hedgerows under Hedgerows Regulations;

- Incorporate historic / archaeological value within the survey and compare with Historic Landscape Characterisation;

- Undertake more representative sample of hedges across the county – the funding necessitated selecting areas near to aggregates extracting quarries;

- Undertake comparison of locations of stone-faced vs earth or turf faced hedgebanks.

7.2 Contribution to Devon BAP Species Rich Hedgerows Target

The Defra LHSG Devon Hedgerow survey and ALSF DHSP have contributed to 4 of the 8 Priority or Indicative Action Plan Targets for Species-rich Hedges in Devon.

- Continue to promote proper hedgerow maintenance, enhancement and restoration via agri-environment schemes, training and education of farmers and other land managers – 88 farmers and landowners received on-farm advice; 38 attended training events. 500 farmers and landowners were mailshotted.

- Continue to encourage planting of new species-rich hedges, especially to fill in gaps in networks and compensate for hedges lost through planning permission – 88 farmers received management plans detailing opportunities and guidelines for new planting.

- Continue to monitor, at a district level, the quantity and quality of hedges and their trees. Ensure the data is available through DBRC – details of 893 hedgerow surveys across Devon will be made available to DBRC.

- Promote an awareness of the wildlife, farming, landscape and archaeological importance of hedges to farmers and the general population of Devon – 88

farmers and landowners received on-farm advice; 38 attended training events. 500 farmers and landowners were mailshotted.

(Species-rich Hedges Devon Biodiversity Action Plan: April 2005)