



BOUNDARIES SURVEY
IN THE PARISH OF COTTENHAM
CAMBRIDGESHIRE

COTTENHAM ENVIRONMENT AUDIT GROUP

Cottenham Environment Audit Group is jointly initiated by
Cottenham Village Design Group : Cottenham Footpath Group : Cottenham Wildlife Group



SUMMARY

During the period spring 2002 to summer 2004 the Cottenham Environment Audit Group surveyed 219 field boundaries within the parish of Cottenham (outside the built environment) to record the make-up and condition of the hedgerows, trees, ditches, lodes and other features forming them. The methodology used was based on that of the Suffolk Hedgerow Survey under the auspices of the Suffolk Coastal Greenprint Forum. The survey required the use of a considerable number of volunteers and the co-operation and assistance of many local residents and landowners.

Several types of boundary were found, the majority being hedgerows and fences of one sort or another (interlaced with remnants of hedgerows). Very little hedge planting appeared to be going on, and hedgerow management was very patchy.

Shrub species were the most frequent found, making up the bulk of boundaries – hawthorn was found in 86.2% of the shrub-containing boundaries surveyed, bramble in 50% and elder in 36.3%. Trees were infrequent in the boundaries, only 230 being found. The most common species were ash (25.2% of all the trees found) and oak (13.9%). Surprisingly some 12.2% of the trees were elm. The herb layer was not specifically surveyed but occasional species of interest were noted.

Many of the boundaries originate from the Enclosures of the 1840s and from post-World War II agricultural improvements, so the hedgerows are relatively young. Cottenham's market gardening and orchard history has left its legacy in the plot sizes and in the number and variety of boundaries.

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1 TERMS OF REFERENCE / INTRODUCTION

The Survey was set up as part of an audit of the parish environment following an initial meeting in late 2000 of representatives of the Cottenham Village Design Group, the Cottenham Wildlife Group (the Cottenham Area Group of the Wildlife Trust for Bedfordshire, Cambridgeshire, Northamptonshire and Peterborough) and the Cottenham Footpath Group. A steering group circulated details to all member organisations of the Fen Edge Community Association and to all other potentially interested individuals and organisations in the parish, both to publicise the survey and to gain volunteers to help.

The intention was “to audit the landscape in the parish of Cottenham by carrying out a detailed boundaries survey, recording the make-up and condition of hedgerows, trees, ditches, lodes and other features forming all of the 535 boundaries in the parish.”

The results of the audit overall were to be:

- local landscape guidelines to be used alongside the Village Design Statement;
- a detailed report of the findings of the boundaries survey;
- a photography project by young people in the village;
- a map/leaflet highlighting locally significant landscape characteristics and features, to be distributed throughout the village;
- information on the village website;
- an action plan recommending practical measures for conservation and improved access.

The details formed the basis for an application for a Local Heritage Initiative Grant (as organised by the Heritage Lottery Fund, The Countryside Agency and the Nationwide) in February 2001. The application was for funding to cover:

- the training of local volunteers in species identification and survey methodology;
- an ecological and visual survey of all the boundaries in the parish;
- the collation of historical material relating to the evolution, drainage and cultivation of the fen edge landscape;
- a photography commission linked to a photography project with local schools;
- public consultation on drafts of survey, report and landscape guidelines;
- limited distribution of full survey results to local libraries and other institutions;
- production of landscape design guidelines – subject to the findings of the survey – as a supplement to the Cottenham Village Design Statement (which is adopted as Supplementary Planning Guidance);
- distribution to all local residents of a map/leaflet containing the highlights of the survey and the other work conducted;
- internet access to the guidelines and survey results by publication on the Fen Edge Community Association website;
- identification of objectives and drawing up a plan for a second phase of the project.

The application was successful, match funding was raised by various means, and work on the audit started shortly after in spring 2001. For the survey, methodologies and training were designed, tested and organised, and surveying started.

Unfortunately, foot and mouth disease became an issue and operations were suspended for a year. The terms of the grant were renegotiated with the Local Heritage Initiative to cater for the delay.

A leaflet (Annexe A) was produced and distributed throughout the parish early in 2002 to further publicise the audit. For the survey, refresher training sessions took place in April that year and surveying restarted. During the period from then until summer 2004 some 219 boundaries were surveyed and the various other aspects of the audit took place.

The outputs of the audit were revised in summer 2004 to:

- the training of local volunteers in species identification and survey methodology;
- an ecological and visual survey of boundaries in the parish;
- an art project with Cottenham Village College and a printmaker, with a one week 'workshop' with students and an exhibition of their work;
- a photography commission of a series of landscape photographs taken during 2003 coupled with the production of a 'postcard pack', an exhibition of the photographs, and long-term loan/display of framed photos in various village and community locations;
- public consultation using a landscape questionnaire circulated to all residents;
- limited distribution of full survey results to local libraries and other institutions;
- recommendations for landscape design guidelines for the Cottenham Village Design Group to include in a revised Village Design Statement;
- distribution to all local residents of a map/leaflet containing the highlights of the survey and the other work conducted;
- internet access to the audit findings, the survey results, a gallery of the art project results and the photography commission work and links for further information by publication on the Fen Edge Community Association website;
- recommendations for future action on relevant topics for appropriate Councils, groups, etc.

2 PARISH CONTEXT

Cottenham is a large parish of 2,800 hectares on the fen edge 6 miles north of Cambridge. The village lies at the northern tip of a ridge of greensand where the medieval open fields were located. North of the village lay permanent peat fenland and summer pasture which proved ideal for rearing cattle and producing the once renowned Cottenham cheese. Other activities included fishing and wildfowling, brick making, osier growing and gravel and peat extraction.

The parish was enclosed and fully drained, relatively late, in the 1840s. In the thirty-year period from 1841 the population grew from 1,833 to 2,499 and much of the village and landscape took on its present form. In the later 19th century pastoral farming declined and its place was partly taken by extensive orchards, soft fruit and flower growing.

Another period of intensive change followed after 1970, seeing a further rapid doubling of the population to about 5,000 today. The village remains a thriving community but increasingly residents are not born in the parish and travel to work outside it. Although farming is still an important activity in the parish, fruit growing has almost disappeared and only a fraction of Cottenham's orchards remain.

Cottenham people have long been active in efforts to preserve their local identity. In the 1970s a Village Society was formed to collate material about Cottenham history and disseminate it to residents old and new. In the 1990s Cottenham was the first village in the UK to publish its own Village Design Statement and have it adopted as supplementary planning guidance.

3 METHODS

3.1 Preparation

A set of instructions for surveyors and a 'Boundaries Survey Form' (based on that of the Suffolk Hedgerow Survey and modified to suit the requirements of the Survey) were produced and tested for ease of use with a few volunteers. Both documents were (further) modified and copies are attached as Annexes B and C respectively.

The boundaries within the parish (outside the built environment) were identified from 1:25000 Ordnance Survey maps. It was expected that there would have been a considerable number of changes between the mapping date and that of the survey. Individual 1km squares on the maps were coded alphabetically from west to east and south to north. This resulted in the parish being covered by forty-three 1km squares (from A in the south west corner to AQ in the north). Boundaries were numbered sequentially from 1 to 535 working from square A through square B and so on to square AQ. Thus each boundary had a unique number prefixed with a 1km square code for location purposes (e.g. A1, N187, AC382).

All the relevant landowners were approached for permission for access to boundaries – this involved approximately fifty individuals and organisations. Permission was obtained from about 50% of those landowners. It was not possible to make contact with every landowner. A proportion of the boundaries were accessible from public rights of way.

Following the outcome of the exercise to obtain landowners' permission and the resulting complexities relating to access a set of 'Supplementary survey notes' (Annexe D) was produced for surveyors. A colour-coding system was used to indicate whether access was permitted or not.

Training sessions for surveyors were organised and run using external professional trainers for appropriate parts of the programme – a copy of the programme is attached as Annexe E. Information packs supplied at the training included specimen survey forms, two sets of instructions, identification guides for trees and shrubs (including the Field Studies Council/Forestry Commission key to common trees), a note on access to land and related issues (Annexe F) with a list of landowners and contact details, health, safety and security guidelines (Annexe G), and a volunteer time-log form (a requirement for Local Heritage Initiative match funding purposes).

3.2 Surveying

Pairs of surveyors chose (or were allocated) one or more 1km squares. Each square's 'survey pack' contained colour-coded maps with numbered boundaries (indicating where permission had been obtained for access to which boundaries) and pre-coded survey forms (one per boundary plus some spares).

Surveys took place during all seasons of the year. On site surveyors started by deciding how many 30m (approximate) lengths (up to 4) were needed to give an accurate representation record of the boundary, and were given the option of sub-dividing the whole boundary into

two if it was very variable. They then produced separate forms for each sub-division after recording the facts on the forms and on the map.

The basic parameters recorded were the trees and shrubs present, the nature of the boundary if not a hedge, the hedge structure if a hedge, adjacent land use and nearby features. Provision was made for general comments and for comments on future planting possibilities.

Surveyors also recorded various facts relating to the location of the boundary and the time taken to survey each boundary.

3.3 Data handling

The data obtained from the survey forms was entered into an Access database designed and built to suit the survey – a screen print of part of a data entry form is shown as Figure 1. The data required for various statistical summaries and analyses were extracted into Excel spreadsheets for manipulations, calculations and data presentation.

4 RESULTS

4.1 Types of boundaries

The types of boundaries found in the survey are shown in Table 1, the total number of boundaries surveyed being 219 (out of a possible total of 535). The type shown as ‘Other’ refers to roads, bridleways, footpaths and boundaries simply not visible on the ground due to, for example, ploughing out. ‘Mixed’ boundaries were mixes of hedge/fence, hedge/ditch, etc.

Table 1

Boundary type	% of total number of boundaries
Hedge only	40.6
Ditch only	16.4
Unfenced track only	3.2
Lode only	2.7
Fence only	1.8
Other	14.2
Mixed	21.1

4.2 Hedge structures

Table 2 shows the frequency (as percentages of the hedges found) of the different types of hedge structure found – for definitions see Annexe B. The percentage of maintained hedges (mechanically cut, newly planted, trimmed A shape, laid) added up to 23% of the hedges found.

Table 2

Type of hedge structure	Frequency (percentage)
Remnant	31.4
Mechanically cut	18.0
Overgrown to ground	15.7
Spaced line of trees	14.0
Overgrown/low trees	9.3
Overgrown/spreading	5.8
Newly planted	4.7
Trimmed A shape	0.6
Laid	0.6

4.3 Botanical composition of hedges

4.3.1 Hedgerow trees

Throughout the surveyed boundaries 230 trees were recorded (in a total of 82 of the boundaries) – the most common species was ash (25.2% of all the trees found) and oak (13.9%). Table 3 shows the relative frequencies of tree species found and Figure 2 shows the same data as a histogram.

Table 3

Tree species	Frequency (percentage)
Ash	25.2
Oak	13.9
Willow	12.2
Elm	12.2
Field maple	9.1
Sycamore	5.7
Beech	3.5
Other	18.3

Table 4 lists the other tree species found.

Table 4

Other tree species found
Alder
Apple
Bird cherry
Cherry
Damson
Hornbeam
Horse chestnut
Lime
Poplar
Rowan
Silver birch
Walnut
White poplar

4.3.2 Hedgerow shrubs

In the 137 boundaries that contained shrub species (with and without trees), hawthorn and bramble were present in 86.2% and 50% respectively. Table 5 shows the percentages of the shrub-containing boundaries that contained each shrub species surveyed, and Figure 3 shows the same data as a histogram.

Table 5

Shrub species	Frequency (percentage)
Hawthorn	86.2
Bramble	50.0
Elder	36.3
Dogrose	28.3
Plum	24.6
Ivy	15.9
Blackthorn	14.5
Hazel	5.1
Sallow	4.3
Privet	3.6
Holly	2.2
Crabapple	2.2
Wayfaring tree	2.2
Guelder rose	1.4
Old Man's Beard	1.4
Honeysuckle	0.7

Table 6 lists the other shrub species found.

Table 6

Other shrub species found
Buckthorn
Buddleia
Dogwood
Hop
Lilac

4.4 Species frequency in boundaries

4.4.1 Tree species

Only 7 boundaries contained one or more tree species with no shrubs. Table 7 shows the number of boundaries with their different numbers of tree species.

Table 7

Number of tree species per boundary	Number of boundaries
1	4
2	2
3	1
Total number of tree-only boundaries	7

4.4.2 Shrub species

For boundaries that contained only shrubs with no trees, Table 8 shows the number of boundaries with their different numbers of shrub species.

Table 8

Number of shrub species per boundary	Number of boundaries
1	26
2	10
3	13
4	8
5	4
6	1
>6	0
Total number of shrub-only boundaries	62

4.4.3 Combined tree and shrub species

For all the boundaries that contained only trees, only shrubs or both trees and shrubs, Table 9 shows the numbers of boundaries with their different numbers of species. Figure 4 shows the same data as a histogram.

Table 9

Number of species per boundary	Number of boundaries
1	30
2	24
3	21
4	23
5	16
6	11
7	9
8	2
9	3
10	4
11	0
12	0
13	1
>13	0
Total number of boundaries with trees and/or shrubs	144

Combining (some of) the data from 4.3.1 and Table 9 in 4.4.3, 230 trees were found in 144 boundaries (hedges and mixed hedge-containing boundaries) – an average of 1.6 trees per boundary.

4.5 Frequency of occurrence of all species

Table 10 shows the frequency of occurrence of all species by representing the percentage of hedges in which they were found. Figure 5 shows the same data as a histogram.

Table 10

Species	Percentage presence in 144 boundaries
Hawthorn	82.6
Bramble	47.9
Elder	34.7
Ash	27.8
Dogrose	27.1
Plum	23.6
Oak	16
Willow	16
Ivy	15.3

Blackthorn	13.9
Elm	13.2
Field Maple	11.8
Sycamore	7.6
Beech	5.6
Hazel	4.9
Sallow	4.2
Privet	3.5
Crabapple	2.1
Holly	2.1
Wayfaring tree	2.1
Guelder Rose	1.4
Old Mans Beard	1.4
Honeysuckle	0.7
23	Total number of species

4.6 Adjacent land use

Table 11 shows the frequency of occurrence of various types of land use adjacent to the boundaries surveyed. Figure 6 shows the same data as a histogram.

Table 11

Type of adjacent land use	Frequency (percentage)
Arable	47.8
Grassland	19.2
Ditch	7.1
Other	6.1
Road	5.4
Grass verge	5.1
Lode	3.4
Gardens	2.4
Woodland	2.0
Bank	1.0
Developed	0.7
Pond	0.0
River	0.0

5 DISCUSSION AND CONCLUSIONS

5.1 The range of types of boundaries reflects predominantly arable land use, borne out by observations of the adjacent land use. The lack of stock means there is less attention paid to hedging, and there is less need for hedging (leaving aside any need for wind and frost protection). The fact that over 31% of hedges were 'remnant' hedges also implies a lack of stock.

5.2 Only 23.9% of hedges were 'maintained' hedges, i.e. 23.9% of hedges were mechanically cut or newly planted or a trimmed A shape or laid. 'Maintained' here means 'looked after' - this does not mean maintained for wildlife or for aesthetic reasons. Nearly 31% of hedges were however overgrown to a greater or lesser extent and appeared to receive little or no maintenance. They are therefore very valuable as wildlife habitats, for species dispersal and as sources of food.

5.3 Cambridgeshire is well known as the English county with the lowest density of trees. The survey counted 230 trees and there was no attempt to measure or calculate any areas surveyed, but a number of comments were made by surveyors about the need for more trees to be planted.

5.4 A fairly wide variety of tree species were recorded, the range of species being reasonably typical of lowland Britain. These and the wide range of shrub species recorded were also a reflection of the various different uses of land in the parish - a few boundaries were the remains of old orchards.

5.5 The commonest tree species found were ash and oak, together representing 39.1% of the trees found. Nationally, oak and ash together represent 65% of hedgerow trees in England (Barr et al., 2002).

5.6 Hawthorn was by far the most common hedgerow species found (in 86.2% of all the shrub-containing boundaries). It is the most frequent woody species in the lowlands of South and East England (and in Great Britain) where it is found in 90% of hedgerows (Barr et al., 2002). Dogrose was present in 28.3% (compared to 35% in the lowlands of South and East England), blackthorn was present in 14.5% (compared to 48%), and hazel was present in 5.1% (compared to 16%). Overall most species were less frequent in the parish than in the lowlands of South and East England.

5.7 Hedges containing five or more woody species may be qualified as species-rich (Bickmore, 2002). Recent national results indicated that only 26% of hedges sampled in Great Britain for the Countryside Survey 2000 were considered species-rich hedges (Haines-Young et al., 2000), and approximately a third of hedges contained only one or two woody species per 30m. Although this survey was conducted of boundaries rather than hedges and was not based on precise 30m sampling, it is nevertheless interesting to note that of 144 boundaries containing trees and/or shrubs surveyed 46 contained 5 or more woody species (just under 32%) and 54 contained 1 or 2 woody species (just under 38%). The generally low numbers of species per hedge may be construed as an indicator of the relatively young age of the majority of hedges in the parish.

5.8 For information, a hedge has been defined as (i) ‘a row of bushes growing closely together, which have been cut to form a dense linear barrier’ (Discovering Cambridgeshire Hedgerows, 1993), and as (ii) ‘a more or less continuous line of woody vegetation that has been subject to a regime of cutting in order to maintain a regular shape’ (Haines-Young et al., 2000).

5.9 The survey set out to record 535 boundaries - the number completed was 219. Statistically that number was significant, but the boundaries surveyed were not selected at random or with any particular criteria in mind. There were various foreseen and unforeseen difficulties, particularly problems of access and a shortage of volunteers, so the boundaries that were surveyed, although they were all over the parish, were not necessarily ‘representative’ of all of the 535.

6 ACKNOWLEDGEMENTS

The Cottenham Environment Audit Group are pleased to acknowledge the help and support for the survey provided by:

Local Heritage Initiative (Heritage Lottery Fund, Nationwide Building Society, The Countryside Agency).

The Wildlife Trust for Bedfordshire, Cambridgeshire, Northamptonshire and Peterborough.

Fen Edge Community Association.

Two professional trainers.

Residents and landowners of the parish.

Approximately twenty volunteer surveyors (including some of those named below).

Approximately ten other volunteers (including some of those named below) concerned with steering the survey, organisation of meetings and training events, administration, the website, production of the report itself, and a variety of small but essential tasks.

Alex Saunders
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Joanna Walley
John Williams
Liz Milway
Mike Smith
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Vicki Harley

7 REFERENCES AND BIBLIOGRAPHY

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8 LIST OF FIGURES

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- 3 Relative frequency of shrub species present
- 4 Frequency of species per boundary
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9 LIST OF ANNEXES

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- B Instructions to surveyors 1 - 'How to survey your boundary'
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