



Maulden Parish Local Hedgerow Survey Report

Acknowledgements

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Prepared by: Heather Webb

BedsLife

Telephone: 01234 228063 **Fax:** 01234 228232

E-Mail: heather.webb@bedscc.gov.uk

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1 Summary

1.1 Objectives

- To collect information about the quantity, quality and distribution of hedgerows in Maulden Parish in order to inform future action to restore or maintain habitats for target species in the area
 - To identify ecologically important hedgerows
 - To contribute to achieving local Biodiversity Action Plan (BAP) targets
 - To assess the current and potential spread of a population of hazel dormice *Muscardinus avellanarius* introduced to the area in 2001
 - To evaluate the change in local hedgerow species composition by repeating elements of a 1975 hedgerow survey

1.2 Findings

- The study covered an area of 1053 ha, encompassing 154 hedgerows in Maulden Parish and representing a total hedgerow length of 34.75 km. Hedgerows that form the boundary of fields, either currently or at one time, rather than garden hedges were included in the survey.
- 38.3% of hedgerows contained more than 4 woody species per 30m section and were species rich, according to the Natural England definition for Eastern England. The most frequently occurring species were hawthorn, elder, blackthorn and dog rose. A total of 34 woody species was recorded.
- Thirteen hedges were found to be in favourable condition under the six criteria given in the hedgerow survey handbook, accounting for 8% of all the hedges surveyed.
- Two-thirds of the hedges were untrimmed at the time of the survey. A full 10% were tall and leggy, and 7% were trimmed and dense.
- Most hedges had associated features, with fences being by far the most common, occurring with almost 2/3 of hedges. Banks and ditches were associated with approximately 30% each.
- The main land use adjacent to hedgerows in Maulden was grassland. Other common land uses were arable, roads and tracks. Nutrient enrichment indicators were found in the adjacent vegetation along most hedgerows.
- There is some evidence of dormouse activity in at least one hedgerow west of Maulden Wood, indicating that a population introduced to the wood in 2001 might be spreading.
- Thirty-four percent of hedgerows were found to be less species-rich than in 1975. Fourteen percent were more species-rich, and the remaining hedgerows showed no change.
- Elder and blackthorn appear to be expanding their range within the parish, while the ranges of dog rose and white bryony appear to be contracting.

2 Introduction

Located in the Milton Keynes – South Midlands Growth Area, Bedfordshire County and its wildlife habitats are under increasing development pressure. One habitat that has suffered greatly over the decades is hedgerows. Between 1945 and 1976, 24% of Bedfordshire’s hedgerow network was lost, with the Boulder Clay area the worst affected (Bedfordshire Natural History Society 1987). Around the county as a whole common hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa* are the most common hedgerow species (Nau and Rands 1978). However there is a great degree of local variation, which is affected by age, past and present management regime, soil type and other factors (Nau and Rands 1978). In turn, hedgerow species richness and condition affect the role that a hedgerow plays in the local ecology. Richer hedges are generally more ecologically valuable. Where hedgerows are scarce, however, even less species-rich hedges are important for wildlife (Nau and Rands 1978).

In 1975 members of the Bedfordshire Natural History Society conducted a detailed survey of hedgerows in Maulden Parish in the centre of the county. The authors compared hedgerow species richness on the Boulder Clay and Lower Greensand geology in the eastern part of the parish. The study found that species richness was much greater on the clay, where 17 different species were found in 20 percent or more of the hedges (Nau and Rands 1976). On the sand, however, only seven species were this widely distributed. Further studies have shown that hedgerows on Maulden’s Boulder Clay are more species-rich than those on Boulder Clay elsewhere in the County (Nau and Rands 1978).

The main landscape feature of Maulden Parish is Maulden Wood. In 2001 a number of hazel dormice *Muscardinus avellanaria* were introduced into the wood. The population has continued to thrive and is monitored regularly by the volunteers of the Bedfordshire Dormouse Group. Dormice are arboreal, only in winter descending to the ground to hibernate. Continuous shrub and/or tree cover is therefore essential for the species to move throughout the landscape (Bright, Morris and Mitchell-Jones 2006). Maulden Wood is surrounded by roads, which could prevent the dormice from expanding their range. Assessing the habitat connectivity of the broader Maulden area, and identifying opportunities to bridge or repair barriers to dormouse movement are among the objectives of the current study.



Hazel dormouse *Muscardinus avellanarius*
Photo courtesy Natural England

Bedfordshire County Council proposed to conduct during 2007 a survey of hedgerows in Maulden Parish. A bid was submitted to The Department of the Environment, Food and Rural Affairs (Defra) in May 2007 by the Biodiversity Partnership Co-ordinator for Bedfordshire and Luton for funding to carry out the survey. An agreement was made between Defra and The Bedfordshire and Luton Biodiversity Partnership on 29th May 2007 to carry out the proposal. The contract commenced on 6th June 2007 and ended on 31st December 2007.

It was agreed that the standard procedure for local surveys, as set out in the Hedgerow Survey Handbook, should be used. Survey training was offered, however most of the

survey team were familiar with the methodology, and the others were unable to attend. Where needed, training was conducted in the field by experienced surveyors.

The standard MS Access database for local surveys was updated and made available by Natural England mid-way through the field work. Survey data were all entered into this database.

Consent was obtained from some landowners in the survey area before the field work began. Much of Maulden is currently in the Bedfordshire County Farm Scheme. Survey consent was obtained before the survey from County Farm tenants. This was obtained by Bedfordshire County Council and Bedfordshire FWAG. Consent from landowners not in the County Farm Scheme was obtained during the survey by the Greensand Trust, a local countryside project based in Maulden and with an extensive network of local contacts.

3 Definitions

The survey uses the following definitions (Defra 2007):

- Hedgerow is defined as any boundary line of trees or shrubs over 20 metres long and less than 5 metres wide at the base
- Species rich hedgerow is one that has four or more native woody species on average in a 30m length (for Eastern England)
- Nodes are where other boundary features and adjoining hedges occur or there is a gap of more than 20m in the woody structure of the hedgerow. A gap of less than 20m is included as part of the hedge.

4 Methodology

The survey area was 1053 ha and covered the whole of Maulden Parish. Maulden is approximately 7 miles south of Bedford in the county of Bedfordshire. The parish is located in the middle of the county on the north side of the River Flit. A survey was carried out on all agricultural hedgerows within the parish for which access permission could be obtained. Garden hedges were not surveyed in this study.

Survey Methodology

The survey followed the methodology for local hedgerow surveys as set out in *Hedgerow Survey Handbook: A standard procedure for local surveys in the UK*, (Defra 2007).

Bedfordshire County Council provided maps and aerial photographs which were used in conjunction with Nau and Rands work (1976) to identify the location of boundaries likely to be hedgerows and give some idea of the extent of Maulden's hedgerow network. A desktop study was carried out before the survey started. Individual farms and sites were surveyed as access permission was obtained.

Consent of most landowners and occupiers was sought prior to starting the survey. Where this could not be done consent was requested during the survey, and where no landowner could be contacted the survey was carried out from public rights of way. A few hedgerows could not be surveyed, as the landowner could not be contacted. These hedgerows were very few, however, and mostly isolated from the main hedgerow network. One landowner denied the survey team access to a hedge, as he did not want strangers near his livestock. This was the only hedgerow to which access was formally denied.

The survey was carried out by the project officer, one field surveyor and several volunteers between July and October 2007.

A field survey form (Appendix 1) was completed for each hedgerow. All agricultural hedgerows were surveyed, as were roadside hedges consisting of more than 50% native species. However garden hedges and those comprising more than 50% non-native species (e.g., *Leylandii* sp.) were not surveyed.

A 30 m section of each hedgerow was surveyed. Where the hedgerow was long enough the survey section began 30 m from a node; the second 30 m section was surveyed. Where the hedgerow was less than 60 m long, the sample section included one end of the hedge. A few hedgerows were less than 30 m (but more than 20 m per the definition of a hedgerow); in these cases the entire hedgerow was sampled and treated as a 30 m section. A reference number was assigned to each hedgerow and recorded on a 1:10,000 map and sides were also allocated to each hedge (A and B).

The following information was collected and recorded in the field survey form:

- Length, width and height of hedgerows
- Adjacent land use
- Number of connecting hedgerows
- Associated features (e.g., banks, ditches, fences)
- Hedgerow shape (trimmed, untrimmed, tall, laid)
- Woody species per 30m section
- Number and species of hedgerow trees found in the whole length of the hedge.
- Percentage cover of nutrient enrichment indicators (docks, cleavers, nettles)
- Type of hedgerow and verge management
- Veteran trees

Data storage

Survey data were entered into the MS Access database prepared by Natural England for use in local hedgerow surveys.

Data were digitised by the Bedfordshire and Luton Biodiversity Recording and Monitoring Centre and the location of hedgerows was mapped using MapInfo GIS.

Survey for dormouse activity

Dormouse tubes were inserted into two hedges around Maulden Wood, in an attempt to determine whether the population introduced to the wood in 2001 is attempting to spread. Tubes are smaller and lighter than nest boxes, and are readily used by dormice for daytime shelter (Bright, Morris and Mitchell-Jones 2006).

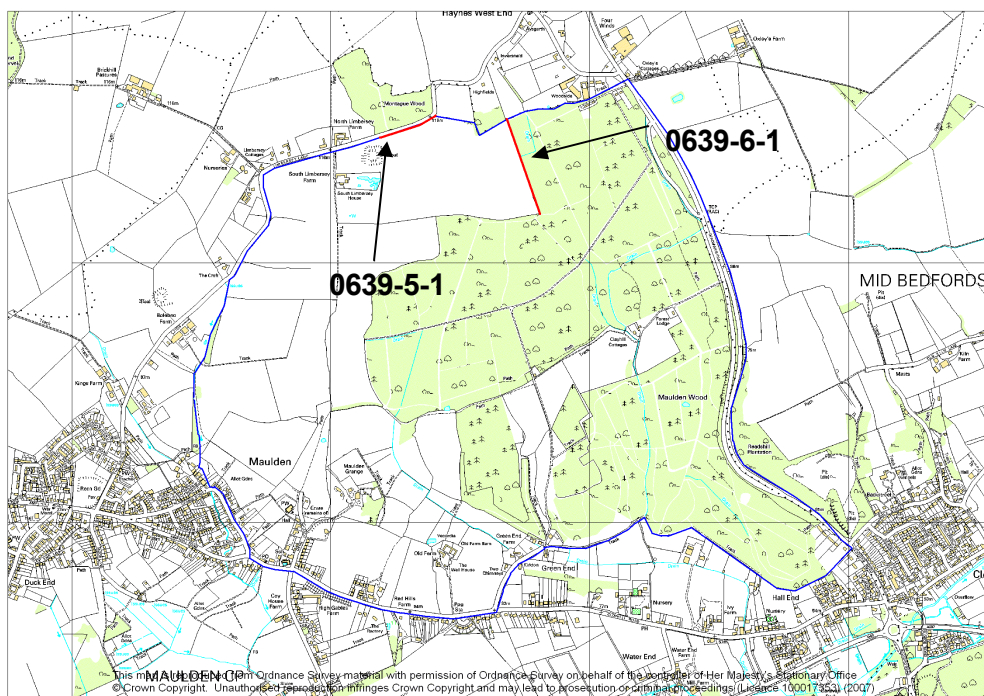
Tubes were placed in hedgerow 0639-6-1 along the western edge of Maulden Wood on August 31 2007 (Figure 1). Eighteen tubes were placed at 20m intervals. Unfortunately, it was later discovered that the Forestry Commission, owners of Maulden Wood, had flailed the hedge on October 5. Many of the tubes had fallen out of the hedge and all tubes had to be removed.



Flailed hedgerow at Maulden Wood, October 2007.
Photo by Sam Mellonie

On September 14, 16 tubes were placed at 15m intervals in hedgerow 0639-5-1 along Limbersey Lane opposite Montague Wood (Figure 1). According to Chanin and Woods (2003) this is rather later than ideal. However this was the earliest date that the survey team could gain landowner approval to access the site.

Figure 1 Location of hedgerows 0639-5-1 and 0639-6-1, Maulden Parish, Bedfordshire



5 Results

The total number of hedgerows surveyed in Maulden Parish was 154 representing a total length of 34.75 km. Fifty-nine hedgerows were species rich, indicating that 38.3% of hedgerows contained more than 4 woody species per 30m section.

Hedgerow condition and management

- Thirteen hedges were found to be in favourable condition under all six criteria, accounting for only 8% of all the hedges surveyed
- 75% passed the criteria for height (at least 1m) and width (at least 1.5m)
- 73% passed the criteria for continuity (<10% gaps and no gaps more than 5m wide)
- 47% passed the criteria for basal canopy height (at least 0.5m for shrubby hedges and 2m for a line of trees)
- 67% passed the criteria for undisturbed ground immediately adjacent to the hedge (at least 2m)
- 88% passed the criteria for herbaceous cover immediately adjacent to the hedge (at least 1m)
- 97% passed the criteria for introduced species (maximum 10%)
- 53% passed the criteria for nutrient enrichment indicators (dock, nettle and cleaver less than 20% of adjacent vegetation)
- Two-thirds of the hedges were found to be untrimmed (67.5%), 7% were trimmed and dense, and 10% were tall and leggy
- Only one percent of Maulden's hedgerows were intensively managed
- The remaining types of hedge made up a small proportion of the total number, including untrimmed with outgrowth (8%). No hedges had been recently coppiced or laid, while 6% had been recently planted.



Surveying roadside hedges on the A6 in Maulden. Photo by Heather Webb

Hedgerow species

A total of 34 hedgerow species were recorded in Maulden. Garden hedges of non-native species were not surveyed. Woody species found in the hedgerows of Maulden Parish are presented in Table 1.

Table 1 Woody species and climbers found in the hedgerows of Maulden Parish, Bedfordshire

Alder (<i>Alnus glutinosa</i>)	Oak, pedunculate (<i>Quercus robur</i>)
Apple, crab (<i>Malus sylvestris</i>)	Plum, cherry (<i>Prunus cerasifera</i>)
Ash (<i>Fraxinus excelsior</i>)	Plum, wild (<i>Prunus domestica</i>)
Beech (<i>Fagus sylvatica</i>)	Plum, bullace (<i>Prunus domestica insititia</i>)
Birch, silver (<i>Betula pendula</i>)	Poplar, railway (<i>Populus x canadensis</i>)
Blackthorn (<i>Prunus spinosa</i>)	Poplar, white (<i>Populus alba</i>)
Broom (<i>Cystius scoparius</i>)	Privet (<i>Ligustrum ovalifolium</i>)
Buckthorn (<i>Rhamnus cathartica</i>)	Privet, wild (<i>Ligustrum vulgare</i>)
Cherry, wild (<i>Prunus avium</i>)	Rose, dog- (<i>Rosa canina</i>)
Dogwood (<i>Cornus sanguinea</i>)	Rose, field- (<i>Rosa arvensis</i>)
Elder (<i>Sambucus nigra</i>)	Spindle (<i>Euonymus europaeus</i>)
Elm, English (<i>Ulmus procera</i>)	Sycamore (<i>Acer pseudoplatanus</i>)
Guelder rose (<i>Viburnum opulus</i>)	Wayfaring-tree (<i>Viburnum lantana</i>)
Hawthorn (<i>Crataegus</i> sp.)	Whitebeam, Swedish (<i>Sorbus intermedia</i>)
Hazel (<i>Corylus avellana</i>)	Willow, goat (<i>Salix caprea</i>)
Holly (<i>Ilex aquifolium</i>)	Willow, grey (<i>Salix cinerea</i>)
Maple, field (<i>Acer campestre</i>)	Willow, white (<i>Salix alba</i>)

The most common shrubby species found during the survey were hawthorn (88% of hedges), elder (38%), blackthorn (37%) and dog rose (34%). Hawthorn-dominated hedgerows (where more than 50% of the species content was hawthorn) constituted 27% of all hedgerows. 97% of hedgerows contained mixed species.

Hedgerow trees

A total of thirty-three hedgerow tree species were identified and recorded during the survey. Of the 602 isolated hedgerow trees recorded, the most common species were ash (30%) and pedunculate oak (21%). There were, however, many more hedgerow trees than are recorded in the Natural England database, as the database does not allow for recording of more than 10 trees per hedgerow.

Two percent of recorded hedgerow trees exceeded 100 cm diameter at breast height (dbh). Two of these were maiden trees, the rest were coppice stools. Approximately 9% of hedgerow trees were between 60 and 100cm, 47% between 20 and 60 cm, 22% between 10 and 20cm and the rest less than 10cm. Details and location of maiden trees greater than 100 cm dbh were recorded in the veteran tree section of the survey form.

Associated features

Most hedgerows were found to have at least one associated feature. Almost 2/3 of hedges (61.9%) had a fence on at least one side. Banks and ditches were found associated with 29.0% and 29.7% of hedges, respectively.

Adjacent land use

The adjacent land use in Maulden was mixed. The main land use by far was grassland; an expected finding given the high rate of livestock farming in the parish. The next most common land uses were arable cropping and minor roads.

The following figures indicate the percentage and number of hedges on at least one side of which a specified feature occurs. It was not possible to survey all hedges on both sides, although most were surveyed on both sides.

- 60.0% (94) of hedges had grassland (improved, semi-improved or unimproved) as an adjacent land use; 38.7% of hedges (60) had arable crops on at least one side.
- There were no water features adjacent to hedges, such as canals, lakes, ponds, rivers or streams.
- 2.5% of hedges (4) had woodland on one side, both young and mature woodland.
- Roads, tracks and footpaths were a major feature associated with hedgerows. 8.4% of hedges (13) had footpaths, 12.3% (19) had tracks, 5.8% (9) had major roads and 31.0% (48) minor roads.
- Uncropped margins were recorded for 1% of hedgerows (2).
- Other adjacent land uses, such as housing, farmyards and gardens, were recorded for 8.4% of hedges (13).
- 80.0% of hedgerows had adjacent vegetation containing nutrient indicators (nettles, cleavers and docks). Of the 31 hedges that did not have adjacent nutrient indicators, 26 were adjacent to woodland and/or roads, tracks and footpaths, where such plant species would be expected less than on agricultural land.

Important fauna

Dormouse tubes in hedgerow 0639-5-1 were checked on December 3 2007. The tubes were checked by Sue Raven. Dr Raven is Senior Project Officer for the Greensand Trust and a licensed dormouse handler.

Two of the 16 tubes contained nests that may have been made by dormice. The first nest (Figure 2) was made of fresh leaves and grass, which had been curled up over the occupant. The nest did not contain any faeces or food and was completely dry. The second nest (Figure 2) was a much less complete structure made of clematis bark and a few fresh leaves. Again there was no faeces or food in the tube. Members of the Bedfordshire Dormouse Group are currently looking at the photographs to see if they can determine which species made the nests.

Figure 2 Two nests found in dormouse tubes placed in hedgerow 0639-5-1 on Limbersey Lane, Maulden, Bedfordshire



Photos by Heather Webb

One tube contained a very different nest of what is assumed to be a wood mouse. This nest (photo at right) was constructed of dead leaves, dried grass and clematis seed. Discarded blackthorn pips and rodent faeces littered the tube platform. Both were sent for examination by the county mammal recorder.

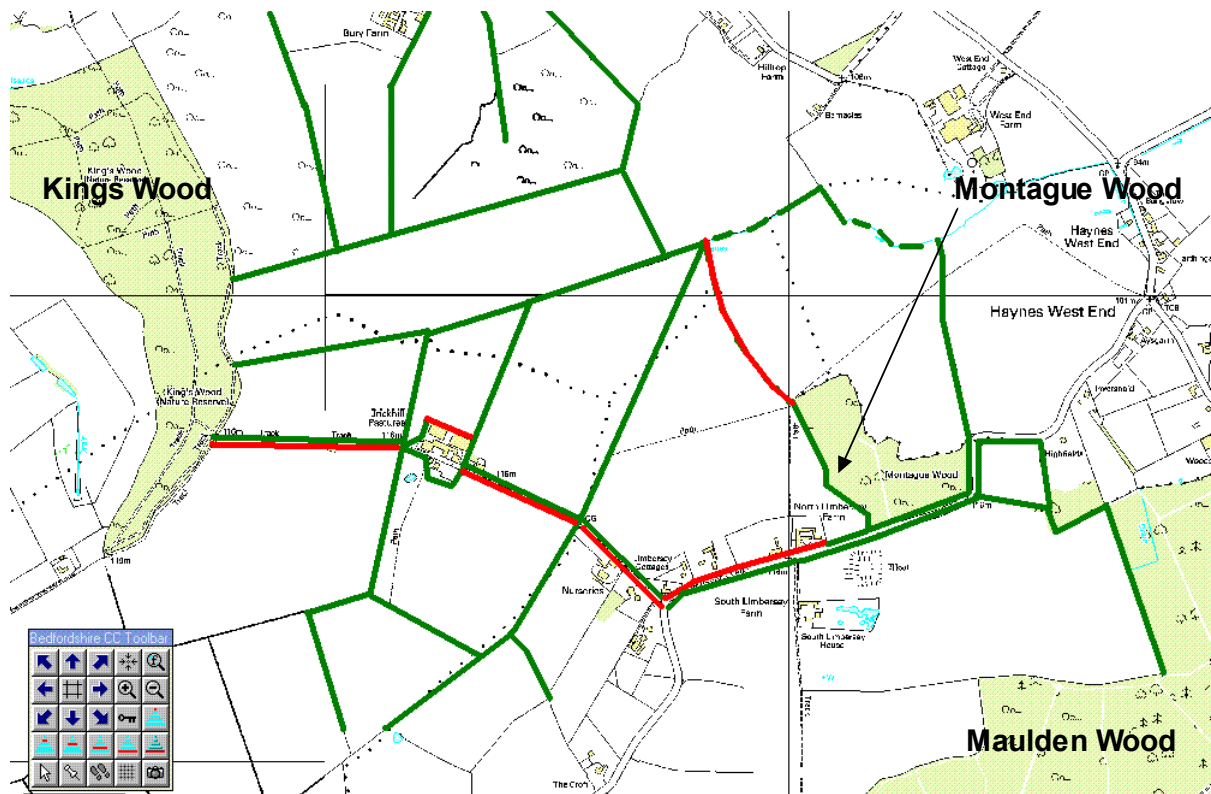
Most of the remaining tubes contained food caches, in one case completely filling the rear half of the tube. These consisted of discarded blackthorn pips, and shrivelled hawthorn and other berries. Rodent faeces were abundant and were collected for examination.



Wood mouse nest. Photo by Heather Webb

Montague Wood is an old coppice wood with what is thought to be suitable dormouse habitat. Northwest of Montague Wood is a hedgerow network leading to areas of scrub and Kings Wood, Houghton Conquest (Figure 3). It is thought that providing enough habitat connectivity in this area could facilitate the range expansion of the Maulden dormouse population. As a first step in this approach, the current study proposed to investigate the feasibility of erecting a dormouse bridge across Limbersey Lane to provide dormice access to Montague Wood.

Figure 3 Hedgerow network between Montague Wood and Kings Wood Houghton Conquest, Bedfordshire



Limbersey Lane, Maulden. Montague Wood is on the left, and hedgerow 0639-5-1 is on the right. Photo by Heather Webb

The red lines indicate where hedgerows are absent; note that there is currently no hedgerow linking the northwest corner of Montague Wood to the hedgerow network. The landowner is well known to The Greensand Trust, however, and some hedgerow planting here is likely possible. Members of the Bedfordshire Dormouse Group are currently making plans to install nest boxes in Montague Wood to determine whether dormice have already managed to cross Limbersey Lane. If not, this area could be a suitable location for the erection of a dormouse bridge over the road.

6 Comparison of current results to 1975

Overall species richness

Forty of the 1975 sample points closely corresponded to sample points in the current study. This permits a general comparison of hedgerow species richness between the two studies. Maps illustrating general species richness in 1975 and 2007 are presented in Figures 4 and 5, respectively.

Figure 4 Number of woody and climber species found at 40 sample sites in the hedgerows of Maulden Parish, Bedfordshire, 1975 (adapted from Nau and Rands 1976)

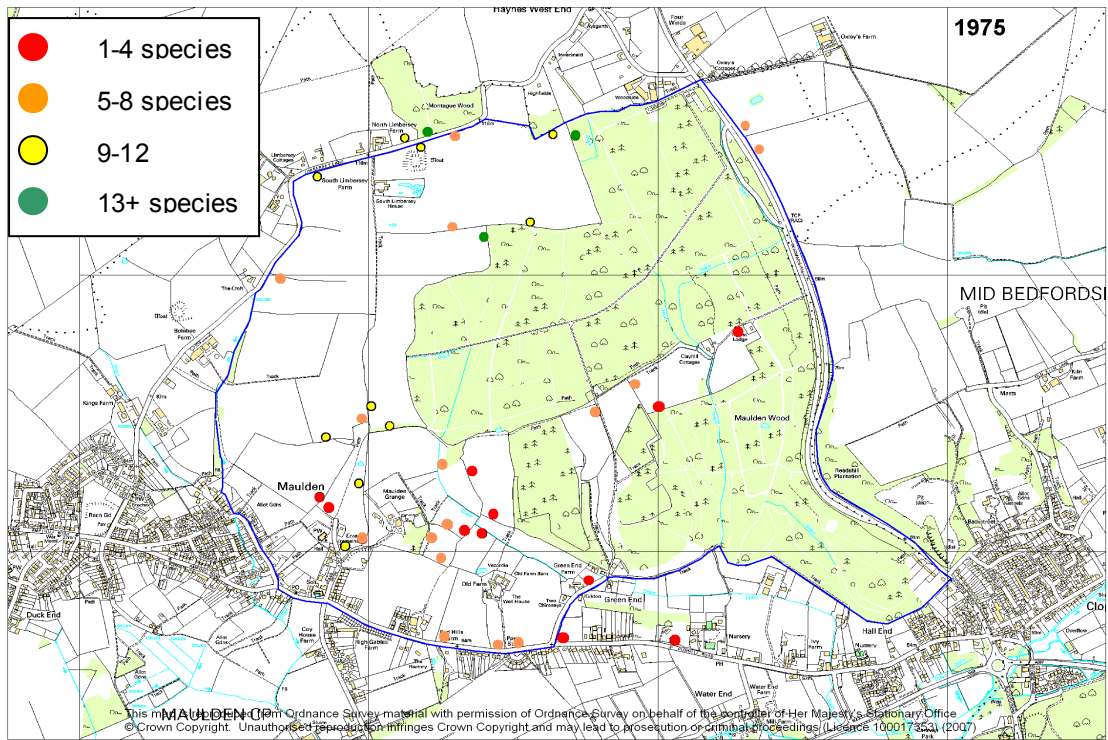
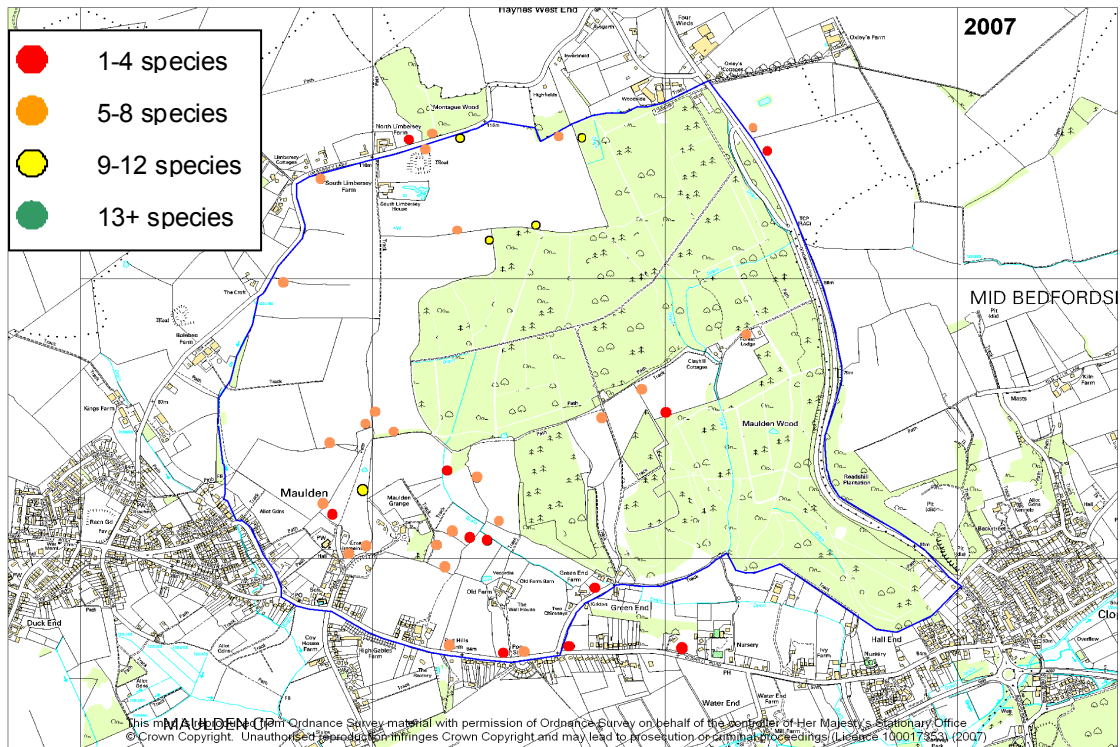


Figure 5 Number of woody and climber species found at 40 sample sites in the hedgerows of Maulden Parish, Bedfordshire (2007)



Nau and Rands (1976) assigned hedgerows to four species richness classes: 1-4 species, 5-8 species, 9-12 species and >13 species. Both woody and climber species (e.g., ivy) were included in the authors' figures. Data from the current study were compiled in the same way to assign the hedges to the same classes, permitting an assessment of how species richness has changed in the last 30 years. Grouped results of these calculations are presented in Table 2.

Table 2 Number and percentage of sample sites in each hedgerow species richness class in 1975 and 2007 in Maulden Parish, Bedfordshire

Species richness class	1975		2007	
	Number	Percent	Number	Percent
1-4 species	11	27.5	11	27.5
5-8 species	16	40	24	60
9-12 species	10	25	5	12.5
13+ species	3	7.5	0	0

Among individual sample sites:

- 35% (14) became *less* species rich between 1975 and 2007
- 53% (21) were in the same species richness class in 2007
- 13% (5) became *more* species rich between 1975 and 2007.

Range and prevalence of individual hedgerow species

Nau and Rands (1976) illustrated the distribution within their study area of 12 hedgerow species. Eleven of these species were similarly analysed as part of the current study (Table 3). Maps comparing the 1975 and 2007 distribution of these 11 species are presented in Appendix 1.

Table 3 Species included in a comparison of range in Maulden Parish, Bedfordshire, between 1975 and 2007

Hazel (<i>Corylus avellana</i>)	Field rose (<i>Rosa arvensis</i>)
Blackthorn (<i>Prunus spinosa</i>)	Dog rose (<i>Rosa canina</i>)
Field maple (<i>Acer campestre</i>)	White bryony (<i>Bryonia alba</i>)
Elm (<i>Ulmus</i> sp.)	Ivy (<i>Hedera helix</i>)
Elder (<i>Sambucus nigra</i>)	Woody nightshade (<i>Solanum dulcamara</i>)
	Black bryony (<i>Tamus communis</i>)

The 1975 study distinguished between two hawthorn species: Midland hawthorn *Crataegus laevigata* and English hawthorn *Crataegus monogyna*. The current study did not differentiate between the two. This was in part because of known hybridisation between them, and in part because of the suspected introduction of other hawthorn species (Nau and Rands 1976). Roadside hedges in particular were often found to include hawthorn with abnormally large fruit and foliage, however the species could not be determined. Similar-looking hawthorn was also sometimes found in internal hedges.

As the various hawthorn species could not reliably be distinguished, efforts were not made to do so.

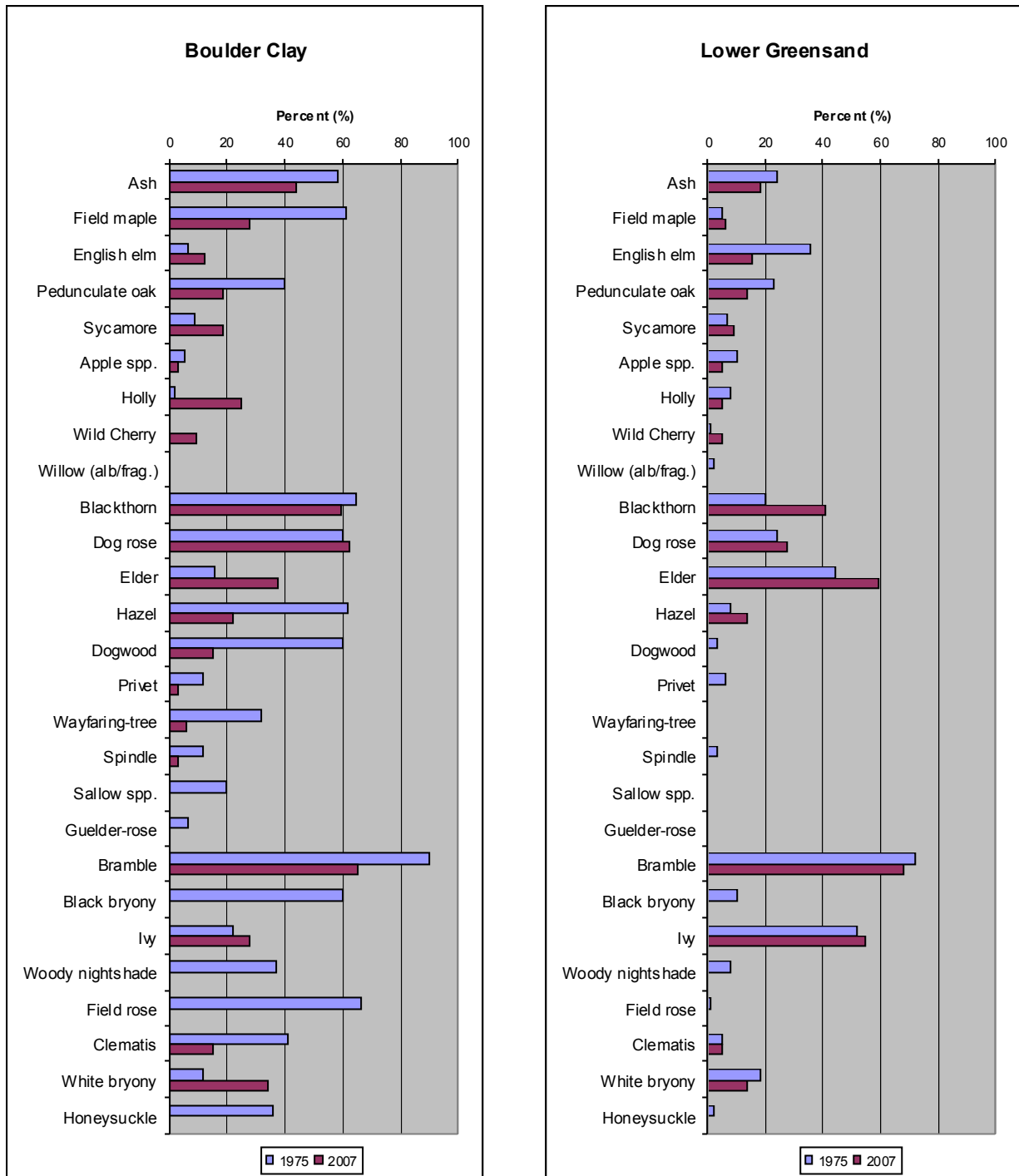
The sample sites from 1975 and 2007 while similar, likely do not overlap exactly. As such, interpretations of the current findings must be made with some caution. However it is felt that they nevertheless do suggest possible future trends. Several species appear to have moved slightly northward; these include elm and dog rose. Two species – woody nightshade and black bryony – disappeared altogether from the sample sites where they had previously been relatively common. Neither species was found in abundance during the survey. Finally, ivy and field rose were two species whose range appeared simply to contract, being found now at substantially fewer sites than in 1975. Table 4 presents a summary of these results for all species included in the comparison.

Table 4 Suggested trends in range and distribution of eleven hedgerow species of Maulden Parish, Bedfordshire, between 1975 and 2007

Species	# sites 1975	# sites 2007	Suggested range trend
Hazel	8	7	Little change
Blackthorn	16	9	Slight expansion southward
Field maple	11	7	Slight contraction
Elm	10	8	Slight contraction and/or shift northward
Elder	8	15	Expansion
Field rose	7	1	Contraction
Dog rose	23	16	Contraction and/or shift northward
White bryony	10	13	Contraction and/or shift northward
Ivy	16	12	Contraction
Woody nightshade	6	10	Contraction (absent from all sites)
Black bryony	12	0	Contraction (absent from all sites)

The increase in elder and blackthorn can also be seen in Figure 6.

Figure 6 Frequency of hedgerow species in hedges on Boulder Clay and Lower Greensand, in 1975 and 2007, Maulden Parish, Bedfordshire (adapted from Nau and Rands 1978)



Nau and Rands (1978) compared the frequency of species appearing in hedgerows on Maulden's Boulder Clay and Lower Greensand areas. By compiling the 2007 data in the same way, one can see that elder has clearly become more common. One landowner told the survey team that he thought there was now more blackthorn in the parish; this certainly appears to be the case on the Greensand.

7 Conclusions

7.1 Practicality of using the procedures for local hedgerow surveys as set out in the Hedgerow Survey Handbook

- The new Hedgerow Survey Handbook was easier to use than the draft handbook used during a 2006 hedgerow census of Studham Parish. Many of the points unclear in the draft handbook have since been clarified
- It remains unclear whether hedgerows should pass or fail a condition assessment based on a survey of only one side of the hedgerow
- There was some difficulty differentiating between verges and perennial herbaceous vegetation associated with hedges

7.2 Issues with using the Natural England hedgerow survey database

The standard MS Access hedgerow survey database provided by Natural England was found to be poorly designed and difficult to use. For example the data entry form:

- Requires the user to switch repeatedly between keyboard and mouse
- Requires the user to scroll down manually to reach fields at the bottom of a page
- Requires the user to switch manually from tab to tab
- Allows a maximum of only ten hedgerow trees per hedgerow
- Does not return the cursor to the first field of the first page when a new record is created
- Does not have an appropriate field tab order set up
- Is generally laid out in a way that is labour intensive and time-consuming for the user
- Cannot easily be used by a volunteer who has not actually participated in collecting data

The database itself:

- Does not have the right built-in queries to permit the user to answer all of the questions in the survey summary form required by Defra
- Can only be used effectively by someone experienced in Access database design, who can create custom queries for robust analysis of survey results
- Is lacking many common species names, requiring users to remember scientific names (a quality not to be expected of volunteers)

7.3 Key features of the survey area

- The non-wooded area of Maulden is 904.5 ha. The survey found 34.75 km of hedgerows, yielding an average of 38.4 m of hedgerow per ha. In comparison, the 2006 survey of Studham Parish in south Bedfordshire found an average of 49.7 m/ha.
- Maulden Parish has large areas of arable fields with no hedgerows. Located on Bedfordshire's Greensand Ridge it is a hilly parish. This renders it more intrinsically susceptible to wind and water-induced soil erosion than more topographically flat areas (Defra 2007b). Planting windbreaks like hedgerows can help reduce soil

erosion (Defra 2007b). Implementing a parish hedgerow planting scheme would not only enhance habitat connectivity and contribute to local and national hedgerow action plans, but would have the added benefit of helping to reduce soil erosion.

- At present the broader hedgerow network around Maulden Wood is probably not sufficient for dormouse range expansion. However at least one key hedgerow leading from the wood appears to be used by the local dormouse population. This would be an essential habitat corridor that must be protected if the population is to expand into the surrounding countryside.
- The apparent progressive loss of some climber species is of concern. Field rose, ivy and woody nightshade all appear to have been greatly reduced in distribution. Reasons for this are unclear and may be worth further investigation.
- Hawthorn dominates many of the hedgerows along Maulden's roads; these shrubs often appear different from those in internal hedgerows. Across the county in general, roadside hawthorn is thought to blossom before other hawthorns. Roadside hedgerows are often the responsibility of local authorities. It is commonly thought that the early-blooming hawthorns are in fact eastern European *Crataegus* species that were purchased by local authorities for roadside planting. Morphologically Maulden's roadside hawthorns appear different however the precise species could not be determined.

7.4 Relationship of survey area to local and national Habitat Action Plan targets

- Elder – commonly considered by farmers to be a “weedy” species – and blackthorn appear to be spreading in Maulden, while other species like field maple and elm appear to be disappearing from the parish. This may indicate a general homogenisation trend, whereby hedgerows may maintain their individual species richness while the species richness of the parish as a whole is reduced.
- Hedgerow extent in the surveyed area does not appear to have changed much since the first survey was conducted.
- Eight percent of Maulden's hedgerows – well below national targets – were found to be in favourable condition. The two most common reasons for failure were height to basal canopy and presence of nutrient indicators
- Only a very few hedgerows were intensively managed, and 1223 m of hedgerows were recently planted (i.e. in the last 5 years).

Map

See attached.

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