

Cambridge Waste Water Treatment Plant Relocation Project
Anglian Water Services Limited

Appendix 8.2: Hedgerow Baseline Technical Appendix

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1 Introduction

1.1 Overview

1.1.1 The Hedgerow surveys were carried out to inform the biodiversity assessment completed for the Proposed Development as reported in Chapter 8: Biodiversity (Application Document Ref 5.2.8). These habitats could be potential constraints to the Proposed Development or influence its design and implementation. An extended Phase 1 Habitat Survey identified and mapped the main habitats within 5km of the boundary of the Proposed Development as it was in 2020 – 2021.

1.1.11.1.2 [Figure 8.16 referenced within this document can be found in the Book of Figures – Biodiversity \(App Doc Ref 5.3.8\).](#)

1.2 Aims and objectives

1.2.1 This report presents the ecological baseline data from hedgerows regulations surveys undertaken between July and September 2021 within the Scheme Order Limits and a buffer zone around it as outlined in Section 1.3. [Additional hedgerows were included within this assessment in February 2024.](#)

1.2.2 Hedgerow baseline data have been collected for the assessment of the Cambridge Waste Water Treatment Plant Relocation (CWWTPR) project.

1.2.21.2.3 This report should be read in conjunction with the Environmental Statement (Volume 5) to which this report is appended.

1.3 Project description

1.3.1 The Proposed Development involves the construction of a new integrated Waste Water Treatment Plant (hereafter proposed WWTP) together with the associated waste water transfer infrastructure, comprising waste water transfer tunnel (underground tunnel), sewer rising main diversions and a treated effluent discharge outfall to the River Cam (the outfall). The Proposed Development also includes a transfer pipeline corridor, the Waterbeach pipeline, from the Waterbeach Water Recycling Centre (WRC) to the existing Cambridge WWTP. The proposed WWTP will incorporate an integrated Sludge Treatment Centre (STC) which would treat sludge imported from other treatment plants in the Cambridge catchment.

1.3.11.3.2 A detailed project description is included in Chapter 2: Project description (App Doc Ref 5.2.2) of the Environmental Statement.

1.3.3 The Proposed Development is located north-east of Cambridge and lies mostly on arable land. The A14 and Low Fen Drove Way County Wildlife Site (CWS) are dominant features

of the landscape lying to the south and east, respectively, of the Proposed Development. The B1047 Horningsea Road borders the proposed WWTP site to the west. The River Cam is west of the waste water treatment plant (WWTP) site and is where discharges of treated effluent will occur.

~~1.3.2~~—The Scheme Order Limit covers an area of approximately 211ha. Surveys were undertaken within a wider area of the Scheme Order Limits as shown in Figure 8.16 Book of Figures – Biodiversity (App Doc Ref 5.3.8) to incorporate hedgerows that fall partially within the Scheme Order Limits, as well as those that wholly are within them. Figure 1.1

~~1.3.3~~~~1.3.4~~ Figure 1.1 below details the location of the Proposed Development and shows the Scheme Order Limits.

1.4 Legislation

1.4.1 The Hedgerows Regulations 1997 protect important hedgerows from damage or destruction. The key principle of the hedgerows regulations is that hedgerows in the countryside are often ancient features that have been part of the landscape for many centuries. Their age, combined with the fact that they are valuable assets in ecological terms, means that important hedgerows merit a degree of protection.

1.4.2 The removal of countryside hedgerows (excluding garden hedges) is prohibited without first submitting a hedgerow removal notice to the local planning authority (LPA). In considering the removal notice, the LPA can order the retention of 'important' hedgerows. The regulations set out the criteria under which hedgerows are considered important.

1.4.21.4.3 A hedgerow is defined within the Hedgerow Survey Handbook (Department for Environment, Food and Rural Affairs, 2007) as 'any boundary line of trees or shrubs over 20 meters (m) long and less than 5m wide at the base, provided that at one time the trees and shrubs were more or less continuous. This includes shrubby hedgerows; lines of trees and gappy hedgerows, where each section may be less than 20m long, but the gaps are less than 20m.'

1.4.31.4.4 For the purposes of the Hedgerows Regulations 1997, a hedgerow is classified as 'important' if it or the hedgerow of which it is a stretch:

- has existed for 30 years or more; and
- satisfies at least one of the criteria listed in Part II of Schedule 1. The criteria are presented in Appendix A Appendix of this document.

1.4.5 All native hedgerows, including species-poor ones, are listed under Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006) and are considered to be of conservation value.

1.4.41.4.6 The UK Biodiversity Action Plan (BAP) defines species-rich hedgerows as those containing an average of five or more native woody species (or at least four in northern and eastern England, upland Wales and Scotland) per 30m length.

Status of hedgerows at the national level

1.4.51.4.7 Historically, hedgerows were listed as a UK BAP habitat and are now listed as a 'Habitat of Principal Importance for the Conservation of Biodiversity in England' under Section 41 of the NERC Act (2006).

1.4.61.4.8 Hedgerows over 20m in length that are composed of at least 80% UK native species are classed as a UK Habitat of Principal Importance. Hedgerows must also be less than 5m wide and have gaps of less than 20m between tree or scrub species to fulfil the Section 41 criteria.

Status of hedgerows at the county level

1.4.71.4.9 Although the UK BAP has been superseded, BAP are still widely used at county level to support Biodiversity 2020 (Department for Food, Environment and Rural Affairs, 2011). Species-rich hedgerows and ancient hedgerows are listed as a Priority Habitat within the BAP for Cambridgeshire and Peterborough, as produced by Cambridgeshire and Peterborough Biodiversity Group, which describes BAP actions to halt the net loss of biodiversity.

2 Method

2.1 Desk study

2.1.1 The aims of the desk study were to identify all hedgerows within the survey area. Phase 1 habitat maps, online databases, aerial images and the following databases were all used to extract the required information:

- Google Maps; and
- Multi-Agency Geographic Information for the Countryside (MAGIC) website.

2.1.2 After being identified by the initial desk study, all hedgerows were then individually numbered using a sequential numerical referencing system to identify them for surveying. Hedgerows less than 20m in length or with gaps of more than 20m in length, were not classed as hedgerows and were not highlighted for surveying. Figure 8.16, Book of Figures – Biodiversity (App Doc Ref 5.3.8) displays the locations of all hedgerows.

2.1.3 The historical importance of hedgerows within 50m of the Proposed Development was reviewed using archived open access Ordnance Survey (OS) Maps of the area dating from 1886. Hedgerows which form historical field patterns are discussed in Section 3.1 of this report.

2.2 Hedgerow assessment

2.2.1 All hedgerows that fall or partly fall within the survey area were surveyed to comply with the requirements of the 'Wildlife and Landscape Criteria' in the Hedgerows Regulations (1997). Areas considered as within the Proposed Development are as follows:

- areas to be directly within the Scheme Order Limits;
- areas that would be temporarily affected during construction;
- areas likely to be impacted by hydrological disruption; and
- areas where there is a risk of pollution and noise disturbance during construction or operation.

2.2.2 Each survey was completed by two ecologists with experience of undertaking botanical and hedgerow surveys. As part of this survey, the hedgerows were identified and mapped in accordance with the Hedgerows Regulations 1997. Species lists were compiled, and any signs of fauna noted. An eight-digit grid reference was taken at the start and end points of each hedgerow using the British National Grid Ordnance System.

- The nomenclature for the vascular plants in this chapter follows Stace (2019) for both scientific and English names.
- 2.2.3 To ensure that quantifiable lengths of hedgerow were surveyed end points were defined as stated in the Hedgerow Survey Handbook (Bickmore, 2002). These were identified as where there was a connection to another feature (for example, hedge, road, wall or fence), a gap of 20m or more or a link to woodland or other semi-natural habitat.
- 2.2.4 Hedgerow surveys were undertaken on each hedgerow within the survey area and within a 50m buffer. 42 hedgerows were surveyed between July and August 2021 to assess their quality and determine the importance of hedgerows present within the survey area. Optimal timing for hedgerow surveys is between May and July, when the woody vegetation is fully in leaf and woodland ground flora can be easily identified.
- 2.2.5 The hedgerows within the survey are shown in Figure 8.16, Book of Figures – Biodiversity (App Doc Ref 5.3.8). The numbering used is non-sequential due to changes in the Scheme Order Limits, with some hedgerows previously included that no longer are within the Scheme Order Limits (in their entirety).
- 2.2.6 The primary and most important criteria for determining whether a hedgerow is covered by the regulations is the number of woody species within the surveyed section. Woody species are defined as those listed in Schedule 3 of the Hedgerows Regulations 1997 and are essentially those tree and shrub species that are indicative of an ancient hedgerow.
- 2.2.7 For the purposes of this assessment, each hedgerow was sampled in typical 30m sections in accordance with the guidance outlined within Schedule 1 Part II of the Hedgerows Regulations 2007:
- hedgerow does not exceed 30m: whole hedgerow surveyed;
 - hedgerow exceeds 30m, but not 100m: central stretch of 30m surveyed;
 - hedgerow exceeds 100m, but not 200m: central 30m stretch within each half of the hedgerow surveyed; and
 - hedgerow exceeds 200m: central 30m stretch within each third of the hedgerow surveyed.
- 2.2.8 The woody species relevant to the Hedgerows Regulations 1997 present in each section were recorded, along with any additional woody species. This included both those not in any of the 30m sections but present in the rest of the length and additional woody species that are not relevant to the hedgerows regulations assessment, for example sycamore *Acer pseudoplatanus* and cherry laurel *Prunus laurocerasus*.
- 2.2.9 Individual woody species were assessed using the DAFOR scale (a simple qualitative plant abundance cover classification system), as follows:

- D: Dominant – comprises most of the community;
- A: Abundant – very frequent in the community but not dominant;
- F: Frequent – frequently seen in the community;
- O: Occasional – seen but not frequently occurring; and
- R: Rare – hardly ever found.

2.2.10 The secondary set of criteria that are assessed relate to the whole hedgerow, not just the 30m section surveyed. Ground flora within the whole hedge and within 1m of the outermost edges of the hedge was recorded. The number of woodland species relevant to the Hedgerows Regulations 1997 was counted as three or more to constitute an associated feature. Woodland species are listed in Schedule 2 of the Hedgerows Regulations 1997 and are plant species that, because of the conditions that they grow in, indicate an ancient hedgerow. Additional features, such as ditches, walls, banks, parallel hedges, connections, and standard and rare trees, were also recorded.

2.3 Survey constraints

2.3.1 It was not possible to survey some areas of the survey area; this was largely due to limited or irregular land access. This included Hedgerow 33, which was not surveyed due to denied land access. Hedgerow 42 was not surveyed as part of the hedgerow surveys. This is the reason for the missing attributes present in Table 3-2, however, during other ecology surveys a species listed on Schedules 1, 5 or 8 of the Wildlife and Countryside Act 1981 (as amended) (WCA) was noted. The hedgerow is important under the Hedgerows Regulations 1997 for this reason.

2.3.2 Hedgerows 43 – 70 did not undergo a field survey, with a desk study carried out using arboricultural survey information (Appendix 8.19: Waterbeach Pipeline Arboricultural Impact Assessment) (App.Doc. Ref 5.4.8.19), and aerial mapping and historical information as outlined in Section 2.1 above. Due to this constraint any of those hedgerows that fall partially or completely within the Scheme Order Limits are precautionary assigned as ‘important’ under the Hedgerow Regulations 1997.

2.3.3 Field surveys were restricted to locations where landowners granted permission, and therefore it was not possible in all instances to survey the hedgerows from both sides in accordance with best practice. In addition, in some areas, vegetation prevented surveyors from accessing both sides of a hedgerow. Nevertheless, it is considered that sufficient data were collected for hedgerow evaluation and that an accurate representation of the species was obtained. ~~Therefore~~Therefore, this is unlikely to have detracted from the reliability of results.

3 Results

3.1 Desk Study Results

3.1.1 Multiple hedgerows within 50m of the survey area are recorded within historical mapping, dating back to 1886. This includes ancient hedgerows bordering fields, tracks and roads. Hedgerows well documented on historical mapping, indicating their long-established presence within the landscape, include hedgerows H1, H3, H4, H7, H8, H9, H10, H13, H14, H21, H25, H32, H33, H34, H37, H38, H40, ~~and H41, H45, H46, H47, H48, H49, H50, H51, H52, H53, H54, H55, H56, H57, H60, H61, H65, H66, H68 and H69.~~

3.2 Field assessment

3.2.1 A total of ~~4241~~ hedgerows were recorded within the survey area and of these 21 were subject to further field-based assessment. ~~Six-Five~~ hedgerows were found to be species-rich, ~~34-25~~ species-poor intact, and 11 species poor defunct. ~~one hedgerow was not fully surveyed, due to access restrictions.~~ Of the 41 hedgerows fully surveyed in this study, 18 were deemed to be important under the Hedgerows Regulations (Table 3-1).

3.2.2 To be classified as important, a hedgerow must be at least 30 years old and meet at least one of the eight criteria set out in Schedule 1 of the Hedgerows Regulations 1997, summarised ~~ummarized~~ in Appendix Appendix A.

3.2.3 Of the ~~six-five~~ species-rich hedgerows identified within the study area, four-two qualified as 'important' under the Hedgerows Regulations 1997 due to their wildlife and landscape value. An additional ~~four~~ hedgerows which comprised four woody species (species-poor intact) also qualified as important hedgerows due to their position adjacent to a by-way open to all traffic and additional features of biodiversity importance.

~~3.2.33.2.4~~ Hedgerow classifications and their locations regarding the context of the Proposed Development are shown in Figure 8.16, Book of Figures – Biodiversity (App Doc Ref 5.3.8). All 'important' hedgerows and their reason for classification are detailed in Table 3-1 and the findings of all hedgerows that underwent surveys and precautionary assessment are detailed in Table 3-2. ~~and the findings of all hedgerows surveyed are detailed in Table 3-2.~~

Table 3-1: Description of hedgerows qualifying as 'important' under the Hedgerows Regulations 1997

Hedgerow number	Land parcel	Length (m)	Species rich	Important	Qualifying features
1	O846	90	Yes	Yes	Desk study indicated hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedgerow between 50-100m, contains at least two standard trees. Ditch present along half of the length of the hedgerow. At least seven woody species listed through the length of the hedgerow. Adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic plus at least four woody species (from Schedule 3) and at least two of the features described in (a) to (g).
4	O846	1,029	Yes	Yes	Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Bank or wall which supports the hedgerow along at least half of its length. Hedgerow exceeds 100m; such number of standard trees (within any part of its length) as would, when averaged over its total length, amount to at least one for each 50m. Connections scoring four points or more in accordance with sub-paragraph (5). A parallel hedge within 15m of the hedgerow. At least desk study suggests hedgerow is part of a historical land boundary (pre-1900). Seven woody species listed throughout the length of the hedgerow. Hedge includes at least six woody species (from Schedule 3), including native black poplar <i>Populus nigra</i> , small or large leaved lime <i>Tilia sp.</i> or wild service tree <i>Sorbus torminalis</i> . Hedgerow includes at least five woody species (from Schedule 3) plus four features. Hedgerow adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Has at least four woody species (from Schedule 3) and at least two of the features described in (a) to (g).
7	O846	470	Yes	Yes	Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Gaps which aggregate do not exceed 10% of length of

Hedgerow number	Land parcel	Length (m)	Species rich	Important	Qualifying features
					hedgerow. Hedgerow exceeds 100m; such number of standard trees (within any part of its length) as would, when averaged over its total length, amount to at least one for each 50m. Ditch present along half of the length of the hedgerow.
8	Ø846	450	Yes	Yes	Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow exceeds 100m; such number of standard trees (within any part of its length) as would, when averaged over its total length, amount to at least one for each 50m. Ditch present along half of the length of the hedgerow. Parallel hedge within 15m of the hedgerow. Hedge includes at least six woody species (from Schedule 3), including native black poplar, small or large leaved lime or wild service tree. Hedgerow adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. At least four woody species (from Schedule 3) and at least two of the features described in (a) to (g).
34	R040	330	No	Yes	Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedge is older than 30 years. Gaps which aggregate do not exceed 10% of length of hedgerow. Ditch present along half of the length of the hedgerow. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. At least four woody species (from Schedule 3) and at least two of the features described in (a) to (g).
40	Y041	230	No	Yes	Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Bank or wall which supports the hedgerow along at least half of its length. Hedgerow exceeds 100m; such number of standard trees (within any part of its length) as would, when averaged over its total length, amount to at least one for each 50m. Ditch present along half of the length of the hedgerow. Hedge adjacent to a bridleway, foot path/road used by

Hedgerow number	Land parcel	Length (m)	Species rich	Important	Qualifying features
					public, path/byway open to all traffic. At least four woody species (from Schedule 3) and at least two of the features described in (a) to (g).
41	Y041	90	No	Yes	Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedgerow exceeds 100m; such number of standard trees (within any part of its length) as would, when averaged over its total length, amount to at least one for each 50m. Ditch present along half of the length of the hedgerow. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. At least four woody species (from Schedule 3) and at least two of the features described in (a) to (g).
42	B041	300	No	Yes	Hedgerow currently supports or has desk study records of protected species in Schedules 1, 5 or 8 of the WCA, or red data book species for 2007 to date.
45	-	240	-	Yes	Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.
50		580		Yes	Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.
51	-	110	-	Yes	Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all

Hedgerow number	Land parcel	Length (m)	Species rich	Important	Qualifying features
					<u>traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>52</u>	-	<u>240</u>	-	<u>Yes</u>	<u>Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>56</u>	-	<u>370</u>	-	<u>Yes</u>	<u>Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>57</u>	-	<u>200</u>	-	<u>Yes</u>	<u>Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>58</u>	-	<u>65</u>	-	<u>Yes</u>	<u>Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>59</u>	-	<u>50</u>	-	<u>Yes</u>	<u>Hedgerow is older than 30 years. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>61</u>	-	<u>100</u>	-	<u>Yes</u>	<u>Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>

Hedgerow number	Land parcel	Length (m)	Species rich	Important	Qualifying features
<u>62</u>	-	<u>180</u>	-	<u>Yes</u>	<u>Hedgerow is older than 30 years. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>63</u>	-	<u>230</u>	-	<u>Yes</u>	<u>Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>64</u>	-	<u>30</u>	-	<u>Yes</u>	<u>Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>65</u>	-	<u>80</u>	-	<u>Yes</u>	<u>Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>67</u>	-	<u>75</u>	-	<u>Yes</u>	<u>Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>68</u>	-	<u>20</u>	-	<u>Yes</u>	<u>Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data.</u>
<u>69</u>	-	<u>130</u>	-	<u>Yes (partially)</u>	<u>Desk study suggested hedgerow is part of a historical land boundary (pre-1900). Hedgerow is older than 30 years. Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all</u>

Hedgerow number	Land parcel	Length (m)	Species rich	Important	Qualifying features
					<u>traffic. Precautionary assumed as meeting hedgerow regulations in absence of field survey data. Hedge forms Milton Road Hedgerows City Wildlife Site.</u>

3.2.5 Of the ~~eight~~¹⁸ important hedgerows identified, ~~two~~^{one} qualified as important due to ~~their~~^{its} high species diversity (H1 and H4) which included seven woody species listed in Schedule 2 of the hedgerows regulations. ~~Two further hedgerows (H7 and H8) were identified due to their species richness in combination with landscape and wildlife features; particularly as the hedgerows contained a high proportion of standard trees.~~

3.2.43.2.6 ~~Seven~~^{The remaining of the} important hedgerows were situated adjacent to a bridleway or by-way open to all traffic. Of these hedgerows, ~~three~~^{one} (H34, H40 and H41) would not have qualified as important hedgerows under additional criteria.

~~3.2.5~~ ~~In addition, one hedgerow (H42) qualified as important due to recording of a species listed in Schedule 1, 5 or 8 of the WCA, therefore fulfilling one criterion of an important hedgerow under the 1997 regulations. This hedgerow would not have qualified as important owing to any additional criteria.~~

3.2.7 Mature standards trees (over 20cm diameter at chest height) were heavily associated with hedgerows throughout the survey area, notably hedgerows H1, H3, H4, H7, H8, H9, H11, H30, H35, H36, H38, H40 and H41. Mature and over-mature ash *Fraxinus excelsior* was accompanied by stands of field maple *Acer campestre* and elder *Sambucus nigra*. Most of the hedgerows also possessed an additional scrub component such as hawthorn *Crataegus monogyna* and blackthorn *Prunus spinosa* (dominant) with dog rose *Rosa canina* (abundant) and elm *Ulmus sp.* (frequent) and dogwood *Cornus sanguinea*.

3.2.8 Among the traditional scrub-dominated hedgerows present within the survey area, the dominant species were hawthorn and blackthorn. However, these species were rarely a monoculture and were frequently associated with stands of rose species (*Rosa sp.*), hazel *Corylus avellana*, wild privet *Ligustrum vulgare* and crab apple (*Malus sylvestris*). Guelder rose *Viburnum opulus* and wild pear *Pyrus pyraster* were rare within the hedgerows themselves but well distributed throughout the survey area. Within hedgerows which qualified as important due to particularly high species richness, hazel, rose species, field maple and dominant hawthorn or blackthorn were noted to be growing within the shrub layer at varying heights at one given location, resulting in a dense appearance to the hedgerow body, with layers of species contributing to a well-defined structure.

3.2.9 The ground flora present tended to be poor and indicative of an enriched sward; narrow grassland strips dominated by cocksfoot *Dactylus glomerata*, dock species *Rumex sp.*, false oat grass *Arrhenatherum elatius* with stands of common nettle *Urtica dioica* and creeping thistle *Cirsium arvense* were present. An exception was H40, where wood false-brome *Brachypodium sylvaticum* and herb Bennet *Geum urbanum* were present. Both species are commonly recorded in shaded habitats across the UK and are commonly found in hedgerows, scrub and woodland.

Table 3-2: Surveyed hedgerows (Y=yes, *=not assessed)

Hedgerow number	Species rich	Important	a) A bank or wall which supports the hedgerow along at least half of its length	b) Gaps which aggregate do not exceed 10% of length of hedgerow	c) Length of hedgerow does not exceed 50m, at least one standard tree (>20cm diameter-at-breast-height (DBH) or 63cm circumference) and its stemmed is >15cm	d) Length of hedgerow exceeds 50m but does not exceed 100m, at least two standard trees	e) Length of hedgerow exceeds 100m, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50m	f) At least three woodland species (Schedule 2) within 1m, in any direction, of the outermost edges of the hedgerow	g) A ditch along at least one half of the length of the hedgerow	h) Connections scoring four points or more in accordance with sub-paragraph (5) ³	i) A parallel hedge within 15m of the hedgerow	Is the Hedgerow obviously less than 30 years in age?	Does hedge currently support or have desk study records of species protected in Schedules 1, 5 or 8 of the WCA, or red data book species for 2007 to date?	Does the hedge include at least seven woody species (from Schedule 3)	Does the hedge include at least six woody species (from Schedule 3) and three features listed overleaf?	Does the hedge include at least six woody species (from Schedule 3), including native black poplar, small or large leaved lime or service tree?	Does the hedge include at least five woody species (from Schedule 3) and four features listed overleaf?	Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic and at least four woody species (from Schedule 3) and at least two of the features described in (a) to (g) above
1	✗	✗				✗			✗			✗						✗
2												✗						
3			Y				Y			Y	Y	Y						
4	Y	Y	Y				Y			Y	Y	Y		Y	Y	Y	Y	Y
5									Y			Y						
6									✗			✗						
7	✗	✗		✗			✗					*	*					✗
8	✗	✗					✗		✗		✗	*	*			✗		✗
9							Y		Y			Y						
10												*	*					
11							Y		Y			*	*					
12												Y						
13	Y										Y	Y						
14											Y	Y						
15												*	*					

Hedgerow number	Species rich	Important	a) A bank or wall which supports the hedgerow along at least half of its length	b) Gaps which aggregate do not exceed 10% of length of hedgerow	c) Length of hedgerow does not exceed 50m, at least one standard tree (>20cm diameter-at-breast-height (DBH) or 63cm circumference) and sits is stemmed is >15cm	d) Length of hedgerow exceeds 50m but does not exceed 100m, at least two standard trees	e) Length of hedgerow exceeds 100m, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50m	f) At least three woodland species (Schedule 2) within 1m, in any direction, of the outermost edges of the hedgerow	g) A ditch along at least one half of the length of the hedgerow	h) Connections scoring four points or more in accordance with sub-paragraph (5) ³	i) A parallel hedge within 15m of the hedgerow	Is the Hedgerow obviously less than 30 years in age?	Does hedge currently support or have desk study records of species protected in Schedules 1, 5 or 8 of the WCA, or red data book species for 2007 to date?	Does the hedge include at least seven woody species (from Schedule 3)	Does the hedge include at least six woody species (from Schedule 3) and three features listed overleaf?	Does the hedge include at least six woody species (from Schedule 3), including native black poplar, small or large leaved lime or service tree?	Does the hedge include at least five woody species (from Schedule 3) and four features listed overleaf?	Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic and at least four woody species (from Schedule 3) and at least two of the features described in (a) to (g) above
16												Y						
17									Y			Y						
18									Y			Y						
19												Y						
20												*	*					
21												Y						
22												Y						
23												Y						
24												Y						
25												Y						
26												Y						
27											Y	Y						
28									Y			Y						
29	Y											Y						
30							Y					Y						
31									Y	Y		Y						

Hedgerow number	Species rich	Important	a) A bank or wall which supports the hedgerow along at least half of its length	b) Gaps which aggregate do not exceed 10% of length of hedgerow	c) Length of hedgerow does not exceed 50m, at least one standard tree (>20cm diameter-at-breast-height (DBH) or 63cm circumference) and its stemmed is > 15cm	d) Length of hedgerow exceeds 50m but does not exceed 100m, at least two standard trees	e) Length of hedgerow exceeds 100m, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50m	f) At least three woodland species (Schedule 2) within 1m, in any direction, of the outermost edges of the hedgerow	g) A ditch along at least one half of the length of the hedgerow	h) Connections scoring four points or more in accordance with sub-paragraph (5) ³	i) A parallel hedge within 15m of the hedgerow	Is the Hedgerow obviously less than 30 years in age?	Does hedge currently support or have desk study records of species protected in Schedules 1, 5 or 8 of the WCA, or red data book species for 2007 to date?	Does the hedge include at least seven woody species (from Schedule 3)	Does the hedge include at least six woody species (from Schedule 3) and three features listed overleaf?	Does the hedge include at least six woody species (from Schedule 3), including native black poplar, small or large leaved lime or service tree?	Does the hedge include at least five woody species (from Schedule 3) and four features listed overleaf?	Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic and at least four woody species (from Schedule 3) and at least two of the features described in (a) to (g) above
32											✗	✗						
33	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
34		Y		Y					Y									Y
35				✗		✗			✗									✗
36				✗		✗			✗									✗
37				Y														Y
38			Y	Y			Y											Y
39			✗															
40		✗	✗	✗			✗		✗									✗
41		✗				✗			✗									✗
42	*	✗	*	*	*	*	*	*	*	*	*	*	✗	*	*	*	*	*
43	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
45	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
50	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
51	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
52	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

Hedgerow number	Species rich	Important	a) A bank or wall which supports the hedgerow along at least half of its length	b) Gaps which aggregate do not exceed 10% of length of hedgerow	c) Length of hedgerow does not exceed 50m, at least one standard tree (>20cm diameter-at-breast-height (DBH) or 63cm circumference) and its stemmed is > 15cm	d) Length of hedgerow exceeds 50m but does not exceed 100m, at least two standard trees	e) Length of hedgerow exceeds 100m, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50m	f) At least three woodland species (Schedule 2) within 1m, in any direction, of the outermost edges of the hedgerow	g) A ditch along at least one half of the length of the hedgerow	h) Connections scoring four points or more in accordance with sub-paragraph (5) ³	i) A parallel hedge within 15m of the hedgerow	Is the Hedgerow obviously less than 30 years in age?	Does hedge currently support or have desk study records of species protected in Schedules 1, 5 or 8 of the WCA, or red data book species for 2007 to date?	Does the hedge include at least seven woody species (from Schedule 3)	Does the hedge include at least six woody species (from Schedule 3) and three features listed overleaf?	Does the hedge include at least six woody species (from Schedule 3), including native black poplar, small or large leaved lime or service tree?	Does the hedge include at least five woody species (from Schedule 3) and four features listed overleaf?	Hedge adjacent to a bridleway, foot path/road used by public, path/byway open to all traffic and at least four woody species (from Schedule 3) and at least two of the features described in (a) to (g) above
56	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
57	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
58	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
59	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
61	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
62	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
63	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
64	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
65	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
66	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
67	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
68	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
69	*	Y	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
70	N	N	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
71	N	N	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

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5 Appendix A

5.1 Criteria for Important Hedgerows

Accompanying notes for Hedgerows Regulations 1997 Record Sheet

- 5.1.1 A hedgerow may be classified as ‘important’ for archaeological/historical reasons, or according to Wildlife and Landscape criteria. To be classified as ‘important’ under the Wildlife and Landscape criteria, the hedgerow must be over 30 years old and should comprise one of the following:
- at least seven woody species/30m
 - *at least six woody species/30m and at least three features
 - *at least six woody spp/30m including any one of Pn/Sot/Tic/Tip (see below)
 - *at least five woody species and at least four features
 - if adjacent to a bridleway/footpath, at least four woody species and at least two features
- 5.1.2 *If the hedgerow is situated wholly or partly in one of the counties listed in Criterion 7 sub-paragraph (2) of the Regulations, the number of woody species should be reduced by one.
- 5.1.3 Note that a hedgerow may also be classified as ‘important’ due to the presence or recorded presence of animal and plant species (see Criterion 6 sub-paragraphs (1)-(4) of the Regulations for details).

Table 5-1: Schedule 3 woody species ‘recognised’ by the Hedgerows Regulations 1997, and species codes to be used on the record sheet

Species code	Scientific name	English name	Species code	Scientific name	English name
Ac	<i>Acer campestre</i>	Field maple	Pa	<i>Prunus avium</i>	Wild Cherry
Ag	<i>Alnus glutinosa</i>	Alder	Pp	<i>Prunus padus</i>	Bird Cherry
Bpe	<i>Betula pendula</i>	Silver Birch	Ps	<i>Prunus spinosa</i>	Blackthorn
Bpu	<i>Betula pubescens</i>	Downy Birch	Pyc	<i>Pyrus communis</i>	Pear
Bxs	<i>Buxus sempervirens</i>	Box	Qp	<i>Quercus petraea</i>	Sessile Oak
Cb	<i>Carpinus betulus</i>	Hornbeam	Qr	<i>Quercus robur</i>	Pedunculate Oak
Cos	<i>Cornus sanguinea</i>	Dogwood	Rc	<i>Rhamnus cathartica</i>	Buckthorn

Ca	<i>Corylus avellana</i>	Hazel	Ruv	<i>Ribes uva-crispa</i>	Gooseberry
Cl	<i>Crataegus laevigata</i>	Midland Hawthorn	Ros	<i>Rosa sp(p)</i>	Rose
Cm	<i>Crataegus monogyna</i>	Hawthorn	Rac	<i>Ruscus aculeatus</i>	Butcher's-broom
Cys	<i>Cytisus scoparius</i>	Broom	Sx	<i>Salix sp(p)</i>	Willow
DI	<i>Daphne laureola</i>	Spurge-laurel	Sxv	<i>Salix viminalis</i>	Osier
Ee	<i>Euonymus europaeus</i>	Spindle	Sn	<i>Sambucus nigra</i>	Elder
Fs	<i>Fagus sylvatica</i>	Beech	Sac	<i>Sorbus aucuparia</i>	Rowan
Fa	<i>Frangula alnus</i>	Alder Buckthorn	Sor	<i>Sorbus sp(p)</i>	Whitebeam
Fe	<i>Fraxinus excelsior</i>	Ash	Sot	<i>Sorbus torminalis</i>	Wild Service-tree
Hr	<i>Hippophae rhamnoides</i>	Sea-buckthorn	Tb	<i>Taxus baccata</i>	Yew
la	<i>Ilex aquifolium</i>	Holly	Tic	<i>Tilia cordata</i>	Small-leaved Lime
Jr	<i>Juglans regia</i>	Walnut	Tip	<i>Tilia platyphyllos</i>	Large-leaved Lime
Jc	<i>Juniperus communis</i>	Common Juniper	Ue	<i>Ulex europaeus</i>	Gorse
Liv	<i>Ligustrum vulgare</i>	Wild Privet	Ug	<i>Ulex gallii</i>	Western Gorse
Ms	<i>Malus sylvestris</i>	Crab Apple	Umi	<i>Ulex minor</i>	Dwarf Gorse
Pal	<i>Populus alba</i>	White Poplar	Um	<i>Ulmus sp(p)</i>	Elm
Pn	<i>Populus nigra sub-species betulifolia</i>	Black-poplar	VI	<i>Viburnum lantana</i>	Wayfaring-tree
Pot	<i>Populus tremula</i>	Aspen	Vop	<i>Viburnum opulus</i>	Guelder Rose
Pcan	<i>Populus x canescens</i>	Grey Poplar			

5.1.4 The presence of several features along a hedgerow influences the classification under the regulations. The terms used on the record sheet are explained in [Table 5-2](#)~~Table 6-2~~ below.

Table 5-2: Terms used on the Record Sheet

Term	Description
Bank/wall	The hedgerow is supported along at least half of its length by a bank/wall.
Intact	The hedgerow contains less than 10% gaps along its length.
Trees	The hedgerow supports at least one standard tree per 50m length (standard trees are defined as those which when measured at 1.3m above ground level have a diameter of at least 20 cm, or 15 cm for multi-stemmed trees).
Three flora species	The hedgerow supports at least three of the valuable ground flora species defined by the Regulations. The hedgerow is considered to support a plant if it is rooted within 1m (in any direction) of the hedgerow.
Ditch	There is a ditch along at least half of the length of the hedgerow.
Connections ≥ four points	A hedgerow must score four or more 'connection points'. Connections with an adjoining hedgerow(s) score one point each and a connection with a pond or woodland (in which the majority of the trees are broad-leaved) scores two points for each. A hedgerow is considered to be connected if it meets the feature or if it has a point within 10m of it and would meet it if the line of the hedgerow continued.
Parallel hedge	A parallel hedgerow is present within 15m.

Table 5-3: Additional terms used on the Hedgerow Regulations Record Sheet.

Species code	Scientific name	English name
Amos	<i>Adoxa moschatellina</i>	Moschatel
Ajr*	<i>Ajuga reptans</i>	Bugle
Alu*	<i>Allium ursinum</i>	Ramsons
An*	<i>Anemone nemorosa</i>	Wood anemone
Amac	<i>Arum maculatum</i>	Lord's-and-ladies
Aff*	<i>Athyrium filix-femina</i>	Lady-fern
Bsp*	<i>Blechnum spicant</i>	Hard-fern
Bs*	<i>Brachypodium sylvaticum</i>	False brome
Bram	<i>Bromopsis ramosa</i>	Hairy brome
Clat	<i>Campanula latifolia</i>	Giant bellflower
Ctra	<i>Campanula trachelium</i>	Nettle-leaved bellflower
Cxsy	<i>Carex sylvatica</i>	Wood Sedge
Cl*	<i>Circaea lutetiana</i>	Enchanter's nightshade
Cmaj	<i>Conopodium majus</i>	Pignut
Daff	<i>Dryopteris affinis</i>	Scaly male-fern
Dcar	<i>Dryopteris carthusiana</i>	Narrow buckler-fern
Dfm	<i>Dryopteris filix-mas</i>	Male-fern
Ehel	<i>Epipactis helleborine</i>	Broad-leaved helleborine
Esyl	<i>Equisetum sylvaticum</i>	Wood horsetail
Eamy	<i>Euphorbia amygdaloides</i>	Wood spurge
Fgig	<i>Festuca gigantea</i>	Giant fescue
Fv*	<i>Fragaria vesca</i>	Wild strawberry
Godo	<i>Galium odoratum</i>	Woodruff
Gsx*	<i>Galium saxatile</i>	Heath bedstraw
Gro*	<i>Geranium robertianum</i>	Herb-Robert
Gu*	<i>Geum urbanum</i>	Wood avens
Hn*	<i>Hyacinthoides non-scripta</i>	Bluebell
Lgal	<i>Lamiastrum galeobdolon</i>	Yellow archangel
Lsqu	<i>Lathraea squamaria</i>	Toothwort
Ls*	<i>Luzula sylvatica</i>	Greater wood-rush
Lnem	<i>Lysimachia nemorum</i>	Yellow pimpernel
Mpra	<i>Melampyrum pratense</i>	Common cow-wheat
Msyl	<i>Melampyrum sylvaticum</i>	Small cow-wheat
Muni	<i>Melica uniflora</i>	Wood melick
Mp*	<i>Mercurialis perennis</i>	Dog's mercury
Meff	<i>Milium effusum</i>	Wood millet
Omas	<i>Orchis mascula</i>	Early-purple Orchid
Oxa*	<i>Oxalis acetosella</i>	Wood sorrel
Pqua	<i>Paris quadrifolia</i>	Herb paris

Species code	Scientific name	English name
PSCO	<i>Phyllitis scolopendrium</i>	Hart's-tongue
Pnem	<i>Poa nemoralis</i>	Wood meadow-grass
Pvul	<i>Polypodium vulgare</i>	Polypody
Pacu	<i>Polystichum aculeatum</i>	Hard shield-fern
Pset	<i>Polystichum setiferum</i>	Soft Shield-fern
Pere	<i>Potentilla erecta</i>	Tormentil
Pste	<i>Potentilla sterilis</i>	Barren strawberry
Pela	<i>Primula elatior</i>	Oxlip
Pvul	<i>Primula vulgaris</i>	Primrose
Raur	<i>Ranunculus auricomus</i>	Goldilocks buttercup
Sne*	<i>Sanicula europaea</i>	Sanicle
Tsn*	<i>Teucrium scorodonia</i>	Wood sage
Vmon	<i>Veronica montana</i>	Wood speedwell
Vodo	<i>Viola odorata</i>	Sweet violet
Vrei	<i>Viola reichenbachiana</i>	Early dog-violet
Vriv	<i>Viola riviniana</i>	Common dog-violet

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