



Greater Cambridgeshire Partnership

Cambridge South East Transportation (CSET) Phase 2



January 2023

Internal



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1 Summary

WSP Real Estate & Infrastructure (WSP RE&I) were commissioned by the Greater Cambridgeshire Partnership (GCP) in August 2022 to conduct habitat type and condition assessments to inform the pre-development ecological baseline for biodiversity net gain (BNG) calculations in relation to the development of the Cambridge South East Transport (CSET) project, Phase 2.

The assessments follow the methodology in Panks et al (2022a and 2022b), as required for biodiversity net gain assessments using the Natural England Biodiversity Metric. Surveys were carried out in the field in over three visits in September, October and November 2022. Where in field-surveys could not be carried out due to access restrictions and/or subsequent red line boundary changes, a precautionary assessment was made, informed by Phase 1 Habitat Survey data (2018 to 2020) and aerial imagery.

The Natural England Biodiversity Metric Tool uses three biodiversity unit categories to measure biodiversity gain/loss:

- Habitat Areas (measured in ha)
- Hedgerows and Lines of Trees (measured linearly in km) and
- Rivers and Streams (measured linearly in km).

A gain (measured in Biodiversity Units) must be achieved in all three categories (where the category is impacted), which cannot be used to offset each other. The ecological baseline assessment therefore covers all three categories.

Habitat Areas generally consisted of lower value habitat types such as 'developed land; sealed surface' and various croplands, but higher value habitats such as 'lowland mixed deciduous woodland', 'other woodland; broadleaved' and 'other neutral grassland' are also present. Impacts to habitats of higher value should be avoided in the first instance, particularly 'lowland mixed deciduous woodland' (high distinctiveness). The largest continuous area of grassland (approximately 1.18ha), is U024 'modified grassland' in the south-east of the scheme; this could be enhanced through reductions in soil fertility and wildflower sowing or creation of a wetland area. The creation of wetland and improvements to the riparian corridor in this area would also improve the habitat condition of watercourse D1 (as habitat improvements within 10m of a watercourse can be included within both the Habitat Area metric and the Rivers and Streams metric).

Native Hedgerows and Native Species-Rich Hedgerows are the predominant hedgerow types within the scheme. The severing or removal of hedgerows and lines of trees should be avoided in the first instance, as they provide connectivity to the wider landscape. However, native hedgerows can be enhanced through planting additional native species within the hedge and hedgerows generally on-site can be improved through the widening/species enhancement and creation of associated field margins.

The River Granta is present within two areas of the scheme, referred to as D1 and D2, and were assessed as being in 'fairly poor' condition. The River Granta at D1 and D2 are considered likely to be over-deep. Reprofilng of the banksides is likely to improve the condition assessment (reducing overdeepness), by increasing hydrological/ecological lateral connectivity. During the scheme design process, a geomorphologist should be consulted on the appropriateness and feasibility of proposed interventions to Rivers and Streams. The pre- and post-development River Condition Assessment calculation does not override the professional judgement of the geomorphologist.

The remaining habitats included within the River and Streams metric were Ditches. Dry ditches could be enhanced to become wet ditches as part of habitat creation, or where they hold water, enhanced with their condition improved from poor to moderate through vegetation clearance and reprofiling.

2 Introduction

2.1 Background

WSP Real Estate & Infrastructure (WSP RE&I) were commissioned by the Greater Cambridgeshire Partnership (GCP) in August 2022 to conduct habitat type and condition assessments to inform the pre-development ecological baseline for biodiversity net gain (BNG) calculations in relation to the development of the Cambridge South East Transportation (CSET) Phase 2 (the 'Scheme').

The aim of this report is to provide a summary of the habitat type and habitat condition of habitat areas, linear habitat features and watercourses within the red line boundary which, in conjunction with a georeferenced dataset, can be used to calculate the pre-development ecological baseline for Biodiversity Net Gain (BNG) using the Natural England Biodiversity Metric or similar.

2.2 Project Description and Purpose of the Scheme

The Cambridge South East Transport (CSET) Project aims to create a vital link to ease congestion, offer sustainable travel choices, connect communities, and support growth in the in the South East of Cambridge. CSET will form part of the Cambridgeshire Autonomous Metro, providing high quality, frequent and affordable public transport.

CSET Phase 2 comprises a segregated public transport route from the A11 (near Babraham) to the Cambridge Biomedical Campus (CBC). This bus route would include new walking, cycling and equestrian links. The scheme location is shown in Appendix A.

2.3 Legislation and Policy

Environment Act 2021

Under the Environment Act 2021 which received Royal Assent on 9 November 2021 and is expected to come into force in winter 2023, proposed developments and Nationally Significant Infrastructure Projects (NSIPs) will be required to deliver a mandatory biodiversity net gain of 10%. Mandatory net gain is measured by the Defra Biodiversity Metric, a tool which calculates biodiversity units for habitat blocks, hedgerows/tree lines and rivers/watercourses. A net gain is required in each of the three categories. While a 10% net gain is not mandatory for planning submissions in 2022, it is considered good practice to aim for a 10% net gain.

National Planning Policy

National Planning Policy is set out by the National Planning Policy Framework (NPPF 2021).

Biodiversity net gains are referenced strongly in terms of developing local planning policy and decision-making for development applications. The environmental test of sustainable development requires planning policy and planning decisions to help to 'improve biodiversity' (paragraph 8c).

References to biodiversity net gain elsewhere in the new NPPF (such as paragraph 174d) support the delivery of biodiversity net gain through sustainable development. Net gain for biodiversity is far more prominent than in the previous NPPF and considers a holistic landscape approach to protect, and enhance biodiversity promoting conservation, restoration, and enhancement of Priority Habitats (also listed as Habitats of Principal Importance) identified under the NERC Act 2006), ecological networks and the protection and recovery of Priority Species (also listed as Species of Principal Importance) identified under the NERC Act 2006). The NPPF includes requirements for planning authorities to identifying and pursuing opportunities for securing measurable net gains for biodiversity (paragraph 179b).

Protected sites and species are a material consideration in determining planning applications and therefore all information relating to protected sites and species must be submitted with planning submissions for determination of the whole application. The NPPF (paragraph 180) which promotes Local Planning Authorities to assess if significant harm would occur to biodiversity and decide accordingly.

Local Planning Policy

The Biodiversity Supplementary Planning Document (Greater Cambridge Shared Planning, February 2022) sets out the goal in Section 5.5.29 to achieve a 20% BNG for all development types within the Oxford to Cambridge (OxCam) Arc development vision.

2.4 Personnel and Quality Assurance

All ecologists employed by WSP RE&I adopt best practice working methods in undertaking surveys including the Chartered Institute of Ecology and Environmental Management's (CIEEM) code of professional and all fieldwork is carried out in accordance with current best practice guidelines and under the supervision of senior staff and appropriately licensed ecologists where applicable.

The habitat assessment was undertaken by Senior Ecologist Taryn Rodgers and Principal Ecologist Andrea Sarkissian, assisted by Consultant Ecologist Mark Johnson and Assistant Ecologist Tom Norman.

Taryn Rodgers MSc is a Senior Ecologist, with six years' experience in ecological consultancy. She is an Associate Member of CIEEM (ACIEEM). She has undertaken numerous extended Phase 1 Habitat Survey and Preliminary Ecological Appraisals. She has worked on biodiversity aspects of both small and large-scale infrastructure projects including biodiversity net gain calculations using the Defra Biodiversity Metric versions 2.0, 3.0 and 3.1. She holds River Condition Assessment accreditation.

Andrea Sarkissian MCIEEM has nine years' experience in ecological consultancy. She has worked on a range of road, rail, housing and flood alleviation schemes. Andrea has carried out a range of Phase 1 Habitat surveys and botanical assessments including condition assessment and monitoring and NVC surveys across a range of habitats across England and Wales, including lowland grassland and woodland and upland bog and acid grassland. She has also completed and reviewed various versions of the Defra Biodiversity Metric.

Mark Johnson is a Consultant Ecologist with five years' experience working within professional ecological consultancy. He has undertaken preliminary ecological appraisals, including Phase 1 habitat surveys.

Tom Norman is an Assistant Ecologist with four years' experience in ecological consultancy.

3 Methodology

3.1 Survey and Report Objectives

The surveys and report were carried out to identify habitat types and condition assessments to create a pre-development ecological baseline, compatible with the Biodiversity Metric 3.1, for use in biodiversity net gain calculations for the CSET scheme.

3.2 Desk Study

The following sources were reviewed:

- Cambridgeshire South East Transport (CSET) Phase 2 Habitat Survey Report (Capita, April 2021).
- Aerial imagery and OS maps.
- Magic Map Application (DEFRA, December 2022).

Due to a boundary change following field surveys in September and October 2022, field surveys were not carried out for some areas of the scheme (identified in Appendix A, see Survey Assumptions and Limitations). For areas where not BNG specific field surveys were carried out, a desk-based conversion from Phase 1 Habitat codes (determined through the Phase 1 Habitat survey carried out between 2018 and 2020, mapped by Capita (April 2021)) and/or aerial imagery to a metric specific habitat type and condition was undertaken.

3.3 Field Survey

The Natural England Biodiversity Metric Tool uses three biodiversity unit categories to measure biodiversity gain/loss:

- Habitat Areas (measured in ha)
- Hedgerows and Lines of Trees (measured linearly in km) and
- Rivers and Streams (measured linearly in km).

A gain (measured in Biodiversity Units) must be achieved in all three categories (where the category is impacted) and a gain in one category cannot be used to offset another. The ecological baseline assessment therefore covers all three categories.



Habitat types must be classified using a modified UK Habitat Classification System (UKHab, based on Butcher et al, 2020) for metric purposes, as set out by the Biodiversity Metric 3.1 Technical Supplement (Panks et al, 2022b)¹. The habitat type and condition are calculated using a standardised methodology as set out in the metric user guidance (Panks et al, 2022a) and technical supplement (Panks et al, 2022b), which usually requires in-field survey. Field survey visits were carried out on 27 to 29 September 2022, 4 October to 6 October 2022 and 3 November 2022 (this visit excluded Modular River Physical Surveys). Weather conditions during surveys were cool and cloudy, with occasional rainfall.

Rivers and Streams

River Condition Assessment

Modular River Surveys are required for the River and Streams metric. It combines information gathered from three river units of different size (module, sub-reach, reach²) including field surveys called Modular River Physical Surveys (MoRPh). The field survey uses the methodology in Gurnell et al (2020), and was led by Taryn Rodgers, who holds River Condition Assessment accreditation. The River Condition Assessment survey extent, including modules, sub-reaches and reaches, is shown in Appendix B.

Each MoRPh survey focuses on a single watercourse and its immediate margins (banks and land area within 10m of the bank edges) and is made up of five contiguous 'modules'. The module length is determined by river width; as the width of the River Granta, which runs through the site, is less than 5m, each module length was 10m as per Gurnell et al (2020). Therefore, each MoRPH survey covered 50m. The results of the MoRPH survey are input into the River Modular Tool, which also includes a desktop assessment for River Type. The River Module Surveys and the River Type together produce a River Condition Assessment, which can be input into the Natural England Biodiversity Metric Tool.

For the Rivers and Streams metric, the number of MoRPh surveys required depends on the site and the character of the river. The MoRPh surveys should capture a minimum 20% length of the river within the on-site area; this will enable changes in riverine condition to be captured (Panks et al, 2022b).

¹ Although UKHab is the underlying classification system in the metric, some habitat types within the metric align with EUNIS or other systems.

² A river reach (typically >100m to 10 km long) is subject to similar boundary conditions. These will include similar bedrock, a similar land cover mosaic and a similar hydrological regime (i.e the reach will be located between major tributaries or flow obstructions such as large weirs or dams). This is defined within the desk study component.



The lengths of the River Granta within the scheme are referred to as D1 and D2, and are located within larger Reaches which extend outside the scheme (located within Reaches D01 and D02 respectively). Reach D01 of the Granta has a river channel length of approximately 6.44km. While Reach D01 is culverted and runs under roads in several locations, this is typical of D01, and the upstream (TL 53964 48906) and downstream (TL 49400 51343) locations mark a change in the Reach, with tributaries being present.

For D1 (the area of the River Granta within Reach D01 which lies within the CSET scheme), a 715m stretch lies within the red line boundary (as provided on 26.09.22; 20% of this stretch was sampled with 5 MoRPH (modules) each at subreach 1 (S01), subreach 2 (S02) and subreach 3 (S03) (5 MoRPH = 50m with 150m sampled in total across three subreaches). The subreaches were spaced approximately evenly throughout D1, with S01 and S03 including hard structural modifications. Following the red line boundary revision dated 24.11.22, the stretch of D1 within the scheme boundary reduced to 158m, with S02 outside the redline boundary, but still connecting S01 and S03. Therefore, the sample area remains appropriate for assessing potential impacts and mitigation for the scheme (>20% sampled).

Reach D02 of the Granta has a river channel length of approximately 3.38km; as a Reach it is characterised by the presence of multiple small tributaries. Its upstream location is contiguous within the downstream location of Reach D01 (TL 49400 51343), with a stretch of tributaries being present which were absent within R01. Its downstream location (TL 46378 51526) is where D02 splits from the wider River Granta.

For D2 (the section of the River Granta within Reach D02 which lies within the CSET scheme), a 570m stretch lay within the red line boundary on 26.09.22, with 17% of this stretch sampled, with 5 MoRPH (modules) each along subreach 1 (S01) and subreach 2 (S02) (5 MoRPH = 50m, with 100m sampled in total across two subreaches). Following the red line boundary revision dated 24.11.22, the stretch of D2 within the boundary reduced to 225m, increasing the sample size to 44% (both subreaches remain within the boundary).

Table 3-1 – Survey Area

River Name	Project Code ³	Reach	Subreach	OS	Date Surveyed	Modules
River Granta	D1	D01	S01	TL 51801 49367	27/09/2022 10:00	1 to 5

³ The Project Code is the reference of a part of the river within the scheme which is being surveyed. The term Project Code is used in Cartographer (the Modular River Survey application) to link relevant parts of a river together to create a River Condition Assessment.

River Name	Project Code ³	Reach	Subreach	OS	Date Surveyed	Modules
River Granta	D1	D01	S02	TL 51650 49642	06/10/2022 09:00	1 to 5
River Granta	D1	D01	S03	TL 51350 49681	06/10/2022 11:43	1 to 5
River Granta	D2	D02	S01	TL 48752 51288	29/09/2022 11:21 & 04/10/2022 16:00	1 to 5
River Granta	D2	D02	S02	TL 48408 51248	04/10/2022 15:44	1 to 5

Rivers and Streams

Although MoRPH surveys can be undertaken at any time of year, they are best completed between May and September inclusive when aquatic vegetation is clearly apparent. Ideal months for survey are May, June and September when all vegetation is visible but not so well developed that it makes access or observation of some physical features difficult. Surveys were carried out in late September and early October; however, this is not considered a significant constraint as vegetation was still visible and, where access was difficult for example due to density of bramble and other scrub, this would have been the case at all times of year.

Weather conditions in 2022 included a prolonged drought which caused some watercourses to dry. As detailed on the River Levels website, the River Granta water levels at Linton are as follows (as of 21 October 2022):

- The usual range of the River Granta at Linton is between 0.07m and 0.74m. It has been between these levels for 90% of the time since monitoring began.
- The typical recent level of the River Granta at Linton over the past 12 months has been between 0.02m and 0.14m. It has been between these levels for at least 152 days in the past year.

Therefore, estimations of the River Granta within the MoRPH surveys may be lower than typical.

Numerous ditches were dry at time of survey, but have still been given a precautionary habitat and condition assessment due to the unusually dry conditions this year, i.e. assessed as likely to retain water for more than 4 months of the year during a typical year. However, the following dry ditches could be excluded from the river metric, as dry ditches are not categorised within the Rivers and Streams biodiversity metric calculation, with the caveat that surveys were undertaken during an atypical year, and may occasionally hold water: D2E, D5A, W02, W03, W06, W07, W22, W24 and W27. Dry ditches however should be recorded as part of the hedgerow type in the Hedgerows and Linear Trees metric.

Ditches W22 and W27 were outside the provisional September 2022 red line boundary and were therefore excluded from field survey. However, they are now included within the November 2022 red line boundary and are considered dry ditches due to observations during water vole and otter surveys carried out in 2022.

Ditches Condition Assessment

There are several habitats within the Rivers and Streams broad habitat type that are not covered by the River Condition Assessment, of which Ditches are the only other River and Streams habitat type applicable to CSET. Ditches have their own Biodiversity Metric 3.1 condition assessment sheet which was used to assess the ditches on-site. Ditches included within the Rivers and Streams metric are defined as *“artificially created, linear water-conveyancing features that are less than 5m wide and likely to retain water for more than 4 months of the year. Their hydraulic function is primarily for land drainage, and although partially or fully connected to a river system, they would not have been present without human intervention”* (Panks et al. 2022b)

For inclusion in the Hedgerows and Line of Trees metric, a ditch is *“a linear depression running adjacent to a hedgerow or line of trees (<2m from the hedgerow centre) which may or may not hold water for part of the year”* (Panks et al. 2022b). Where a ditch has been included in the Rivers and Streams metric it cannot also be included in the hedgerows’ metric, therefore the hedgerow type should be recorded without recognition of the ditch.

3.4 Survey Limitations and Assumptions

Habitat Areas and Hedgerows and Lines of Trees

The optimum survey period for habitats is April to October, inclusive. Although habitat type and condition assessments were carried out late September to early October, within the optimum period, some plant species may not be evident due to dormancy. A survey visit was carried out in November, outside the optimum season, in the north of the scheme. However, as this is a predominantly urban area with small areas of immature plantation, this is not considered to be a significant constraint.

4 Results

4.1 Habitat Type and Reference Numbers

The habitat types and BNG reference numbers assigned to each Habitat Area (reference prefix U), Hedgerows and Lines of Trees (reference prefix H) and Rivers and Streams (reference prefixes D or W) are illustrated within the maps in Appendix C. Note, the maps follow the Biodiversity Metric QGIS styles, so some habitat types share the same symbols, i.e. all cereal crop subcategories, native species-rich hedgerow subcategories (including if no trees, trees or associated with bank or ditch) and native hedgerow subcategories are grouped together.

4.2 Habitat Areas

The Habitat Area results are detailed within Table 4-1. An overview is provided below, under Broad Habitat headings.

Cropland

Approximately 100ha of cropland is present within the red line boundary (as defined on 24.11.22), predominantly composed of 'Cereal crops' and 'Cereal crops winter stubble', with smaller areas of 'Non-cereal crops' (vegetables) and arable field margins likely to be under stewardship schemes including 'Arable field margins pollen & nectar' and 'Arable field margins game bird mix.' There are no condition assessments for Cropland, as this is 'Not applicable' within the Biodiversity Metric.



Photograph 1: Arable field margins game bird mix (reference U115)



Photograph 2: Cereal crop with winter stubble (U074), modified grassland margin (U139) and ditch (W27)

Grassland

Approximately 7ha of grassland is present within the red line boundary (as defined on 24.11.22), comprising 'Other neutral grassland' and 'Modified grassland'. These habitats are predominantly in good or moderate condition, although approximately 1.4ha are in poor condition (often in association with trackways/ingress of machinery). The grasslands are typically roadside verges, field margins or small areas of amenity grassland, in strips of <0.1ha. The largest continuous area of grassland (approximately 1.18ha), is U024 'Modified grassland' in the southeast of the scheme.



Photograph 3: Modified grassland (U024)



Photograph 4: Other neutral grassland alongside public right of way (PROW) (U077)

Heathland and Shrub

Approximately 0.1ha of Heathland and Shrub, comprising a single area of ‘Mixed scrub’ is present on-site, in moderate condition.



Photograph 5: Mixed scrub (U045)

Lakes

Approximately 0.02ha of Lakes are present on-site, comprising a single ‘Pond (Non-Priority Habitat)’ in poor condition, used for agricultural irrigation.

Adjacent to the red line boundary (as defined on 24.11.22) are several larger ‘Pond (Non-Priority Habitats)’; in the north of the scheme these are mitigation ponds associated with other developments, and in the south are associated with agricultural irrigation and wildfowl (with game hunting). The ponds to the south may support invasive non-native American signal crayfish, which are considered present in adjacent watercourse D1.



Photograph 6: Pond (Non-Priority Habitat) (U113)

Urban

Approximately 4.4ha of Urban habitat are present on-site, predominantly comprising ‘Developed land; sealed surface’ in the form of existing roads and footpaths (approximately 4.16ha). There are no condition assessments for ‘Developed land; sealed surface’, as this is ‘Not applicable’ within the Biodiversity Metric. There is a construction area (approximately 0.0010ha within the boundary) of ‘Vacant/derelict land/bare ground’ which is in poor condition, and approximately 0.3ha of ‘Urban Tree’ which are in predominantly classified as ‘poor’ condition, as they are young trees. The condition may improve long-term as the trees mature and develop features which support a greater number of ecological niches.



Photograph 7: Typical 'Urban trees' within the red line boundary



Photograph 8: Lowland mixed deciduous woodland (U008)

Woodland and Forest

Approximately 3.2ha of Woodland and Forest habitat are present on-site, predominantly comprising 'Other woodland; broadleaved' (2.28ha), with 'Lowland mixed deciduous woodland' (approximately 0.96ha) also present.

The 'Other woodland; broadleaved' woodland was assessed as poor to moderate condition, including young, failed plantation (due to drought conditions) and planted stands of uniform age, with approximately 0.0003ha assessed precautionarily as good condition (as not accessed). Where there was a choice between assessing a habitat as grassland or 'Other woodland; broadleaved woodland', woodland was chosen even where young trees appeared to be failing to establish (as in U100), as the land appeared to be funded and managed for plantation (should the CSET development not occur).

Approximately 0.544ha of 'Lowland mixed deciduous woodland' was assessed precautionarily as good condition as it was not accessed, with the remaining habitat in poor to moderate condition.



Photograph 9: Other woodland; broadleaved woodland, newly planted (U100)

Table 4-1 - Habitat Area Pre-Development Ecological Baseline Results

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U001	Grassland	Other neutral grassland	Moderate	0.1514	Roadside verge	Field survey 2022.
U002	Urban	Developed land; sealed surface	N/A - Other	0.5146	Existing road & hardstanding	Field survey 2022.
U003	Grassland	Other neutral grassland	Moderate	0.2005	Roadside verge	Field survey 2022.
U004	Grassland	Modified grassland	Good	0.1370	Roadside verge	Field survey 2022.
U005	Cropland	Non-cereal crops	Condition Assessment N/A	8.9459		Field survey 2022.
U006	Woodland and forest	Other woodland; broadleaved	Moderate	0.1132		Field survey 2022.
U007	Grassland	Modified grassland	Good	0.1942	Field margin	Field survey 2022.
U008	Woodland and forest	Lowland mixed deciduous woodland	Moderate	0.0375		Field survey 2022.
U009	Urban	Developed land; sealed surface	N/A - Other	0.1237		Field survey 2022.
U010	Cropland	Cereal crops	Condition Assessment N/A	6.6920		Field survey 2022.
U011	Urban	Developed land; sealed surface	N/A - Other	0.0118		Field survey 2022.
U013	Grassland	Modified grassland	Moderate	0.0089	Strip of grassland adjacent to trackway.	Field survey 2022.

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U016	Cropland	Cereal crops	Condition Assessment N/A	0.8921		Field survey 2022.
U017	Cropland	Cereal crops	Condition Assessment N/A	2.3588		Field survey 2022.
U018	Grassland	Modified grassland	Moderate	0.1429		Field survey 2022.
U019	Woodland and forest	Other woodland; broadleaved	Moderate	0.2438		Field survey 2022.
U020	Woodland and forest	Lowland mixed deciduous woodland	Poor	0.2498		Field survey 2022.
U024	Grassland	Modified grassland	Moderate	1.1849		Field survey 2022.
U026	Cropland	Arable field margins pollen & nectar	Condition Assessment N/A	0.0401	Temporary cover, likely in stewardship.	Field survey 2022.
U027	Woodland and forest	Other woodland; broadleaved	Poor	0.0279		Field survey 2022.
U028	Woodland and forest	Other woodland; broadleaved	Moderate	0.0008	Uniform age with signs of recent planting.	Field survey 2022.
U030	Urban	Developed land; sealed surface	N/A - Other	0.1999		Field survey 2022.
U032	Cropland	Cereal crops	Condition Assessment N/A	18.8117		Field survey 2022.
U033	Cropland	Cereal crops	Condition Assessment N/A	0.1022		Field survey 2022.
U034	Grassland	Modified grassland	Good	0.0572	Roadside/footpath verge	Field survey 2022.

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U034	Grassland	Modified grassland	Good	0.0125		Field survey 2022.
U035	Urban	Developed land; sealed surface	N/A - Other	0.0839	Footpath	Field survey 2022.
U036	Urban	Developed land; sealed surface	N/A - Other	0.1950		Field survey 2022.
U037	Cropland	Cereal crops	Condition Assessment N/A	2.2609		Field survey 2022.
U038	Urban	Developed land; sealed surface	N/A - Other	0.0289		Field survey 2022.
U039	Cropland	Cereal crops	Condition Assessment N/A	8.0013		Field survey 2022.
U041	Grassland	Modified grassland	Poor	0.0065	Amenity grassland in industrial estate.	Field survey 2022.
U042	Urban	Developed land; sealed surface	N/A - Other	0.1511		Field survey 2022.
U043	Woodland and forest	Other woodland; broadleaved	Moderate	0.7739		Field survey 2022.
U044	Grassland	Modified grassland	Moderate	0.7620	Rank grassland	Field survey 2022.
U045	Heathland and shrub	Mixed scrub	Moderate	0.0919		Field survey 2022.
U046	Grassland	Other neutral grassland	Poor	0.5607		Field survey 2022.
U047	Grassland	Other neutral grassland	Poor	0.4380		Field survey 2022.

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U049	Cropland	Non-cereal crops	Condition Assessment N/A	5.6549		Field survey 2022.
U050	Woodland and forest	Lowland mixed deciduous woodland	Good	0.0002	Not assessed as arable fringe, so given a precautionary assessment in case scheme is extended into woodland.	Field survey 2022.
U051	Cropland	Cereal crops winter stubble	Condition Assessment N/A	1.5742		Field survey 2022.
U052	Cropland	Cereal crops winter stubble	Condition Assessment N/A	5.0000		Field survey 2022.
U053	Urban	Developed land; sealed surface	N/A - Other	0.0305		Field survey 2022.
U054	Cropland	Cereal crops	Condition Assessment N/A	1.7502		Field survey 2022.
U055	Cropland	Non-cereal crops	Condition Assessment N/A	7.2039		Field survey 2022.
U056	Grassland	Other neutral grassland	Poor	0.1662	Field margin	Field survey 2022.
U057	Grassland	Modified grassland	Poor	0.0058	No access as private gardens. Assigned same condition assessment as adjacent modified grassland polygon U118.	Field survey 2022.
U058	Urban	Developed land; sealed surface	N/A - Other	0.0015		Field survey 2022.
U059	Urban	Developed land; sealed surface	N/A - Other	0.5625		Field survey 2022.

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U060	Grassland	Modified grassland	Poor	0.0116	Amenity grassland verge	Field survey 2022.
U061	Cropland	Cereal crops	Condition Assessment N/A	8.1413		Field survey 2022.
U062	Grassland	Modified grassland	Good	0.0094	Verge adjacent to dog exercise field. Precautionary assessment as did not directly access but viewed from roadside as it was in use during the survey.	Field survey 2022.
U063	Grassland	Modified grassland	Good	0.1794	Dog exercise area. Precautionary assessment as did not directly access but viewed from roadside as it was in use during the survey.	Field survey 2022.
U064	Urban	Developed land; sealed surface	N/A - Other	0.3082		Field survey 2022.
U066	Cropland	Cereal crops	Condition Assessment N/A	2.5624		Field survey 2022.
U067	Woodland and forest	Lowland mixed deciduous woodland	Moderate	0.0252		Field survey 2022.
U068	Cropland	Cereal crops	Condition Assessment N/A	2.0838		Field survey 2022.
U069	Grassland	Modified grassland	Good	0.0153	Field margin.	Field survey 2022.
U070	Urban	Developed land; sealed surface	N/A - Other	0.4043		Field survey 2022.
U071	Cropland	Cereal crops winter stubble	Condition Assessment N/A	7.8126		Field survey 2022.

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U072	Grassland	Modified grassland	Moderate	0.0003	Field margin.	Field survey 2022.
U074	Cropland	Cereal crops winter stubble	Condition Assessment N/A	3.9906		Field survey 2022.
U075	Cropland	Cereal crops	Condition Assessment N/A	0.0539		Field survey 2022.
U076	Grassland	Other neutral grassland	Good	0.0126	Field margin.	Field survey 2022.
U077	Grassland	Other neutral grassland	Good	0.0960	Grassland strip along PROW.	Field survey 2022.
U078	Grassland	Other neutral grassland	Moderate	0.0084		Field survey 2022.
U079	Grassland	Other neutral grassland	Good	0.0117	Mitigation area seeded with a meadow mix.	Field survey 2022.
U082	Urban	Developed land; sealed surface	N/A - Other	0.0007		Field survey 2022.
U083	Woodland and forest	Other woodland; broadleaved	Poor	0.0425		Field survey 2022.
U084	Grassland	Other neutral grassland	Moderate	0.0065		Field survey 2022.
U084	Grassland	Other neutral grassland	Moderate	0.0108		Field survey 2022.
U086	Grassland	Other neutral grassland	Moderate	0.0981		Field survey 2022.
U087	Urban	Urban Tree	Poor	0.0866		Field survey 2022.
U088	Urban	Urban Tree	Poor	0.0694		Field survey 2022.

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U088	Urban	Urban Tree	Poor	0.0890		Field survey 2022.
U088	Urban	Urban Tree	Poor	0.0392		Field survey 2022.
U089	Grassland	Other neutral grassland	Moderate	0.0475		Field survey 2022.
U090	Grassland	Other neutral grassland	Moderate	0.0105		Field survey 2022.
U092	Grassland	Other neutral grassland	Moderate	0.0120		Field survey 2022.
U093	Grassland	Other neutral grassland	Moderate	0.0158		Field survey 2022.
U095	Urban	Vacant/derelict land/ bareground	Poor	0.0010	Construction area.	Field survey 2022.
U097	Woodland and forest	Other woodland; broadleaved	Poor	0.5268		Field survey 2022.
U099	Grassland	Other neutral grassland	Moderate	0.0129	G4 on 2020 NVC map	Desk, NVC 2020.
U100	Woodland and forest	Other woodland; broadleaved	Poor	0.1781	Young, failed plantation, likely due to drought conditions.	Field survey 2022.
U102	Cropland	Cereal crops	Condition Assessment N/A	3.4669		Field survey 2022.
U104	Urban	Urban Tree	Moderate	0.0056		Field survey 2022.
U107	Grassland	Other neutral grassland	Good	0.1717	Field margin	Field survey 2022.
U110	Woodland and forest	Other woodland; broadleaved	Good	0.0003	Not accessed, very small area on fringes of site. Given a precautionary assessment.	Field survey 2022.

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U111	Urban	Developed land; sealed surface	N/A - Other	1.5387		Field survey 2022.
U112	Urban	Developed land; sealed surface	N/A - Other	0.0013		Field survey 2022.
U113	Lakes	Ponds (Non- Priority Habitat)	Poor	0.0206	For agricultural irrigation	Field survey 2022.
U114	Grassland	Other neutral grassland	Poor	0.0667	Rank grassland field margin.	Field survey 2022.
U115	Cropland	Arable field margins game bird mix	Condition Assessment N/A	0.1790	In higher-level stewardship scheme for bird winterfeeding (spoke with landowner).	Field survey 2022.
U116	Woodland and forest	Other woodland; broadleaved	Poor	0.3621	Currently grassland (part of U044, but landowner stated there is a fully funded scheme in place with Forestry Commission for plantation woodland winter 2022. As per BNG guidance have therefore assessed as woodland as would have been if no development.	Field survey 2022.
U117	Grassland	Modified grassland	Moderate	0.0088	Field margin	Field survey 2022.
U118	Grassland	Modified grassland	Poor	0.0365	Field margin	Field survey 2022.
U119	Grassland	Modified grassland	Poor	0.0263		Field survey 2022.
U120	Grassland	Modified grassland	Poor	0.0169	Field margin	Field survey 2022.

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U121	Grassland	Modified grassland	Poor	0.0758	Roadside verge	Field survey 2022.
U122	Grassland	Modified grassland	Poor	0.0058	Field margin	Field survey 2022.
U123	Grassland	Modified grassland	Moderate	0.1554	Field verge	Field survey 2022.
U124	Grassland	Modified grassland	Good	0.1816	Field margin	Field survey 2022.
U125	Grassland	Modified grassland	Good	0.5801	Field margin	Field survey 2022.
U126	Grassland	Modified grassland	Good	0.0571	Field margin	Field survey 2022.
U127	Grassland	Modified grassland	Moderate	0.0893	Field margin	Field survey 2022.
U129	Cropland	Arable field margins pollen & nectar	Condition Assessment N/A	1.9159		Field survey 2022.
U130	Grassland	Modified grassland	Good	0.1609	PROW/field margin	Field survey 2022.
U131	Grassland	Modified grassland	Good	0.0648	PROW margin	Field survey 2022.
U132	Woodland and forest	Other woodland; broadleaved	Poor	0.0111	Recently planted	Field survey 2022.
U136	Grassland	Modified grassland	Good	0.0447	Amenity grassland on roundabout	Field survey 2022.
U139	Grassland	Modified grassland	Good	0.1621	Precautionary assessment, assumed field margin present as at U130, although arable within Phase 1 data	Desk study, Phase 1 data 2020.

BNG ref	Broad Habitat	Habitat Type	Condition	Area (ha)	Comment (where relevant)	Data Source
U140	Grassland	Other neutral grassland	Moderate	0.0536		Desk study, Phase 1 data 2020.
U141	Grassland	Other neutral grassland	Moderate	0.0078	Precautionary condition assessment based on typical field verges of the same Phase 1 habitat type, as not assessed in-field.	Desk study, Phase 1 data 2020.
U142	Grassland	Other neutral grassland	Moderate	0.1318		Desk study, Phase 1 data 2020.
U143	Cropland	Cereal crops	Condition Assessment N/A	0.0188	Based on Phase 1 habitat survey	Desk study, Phase 1 data 2020.
U144	Grassland	Other neutral grassland	Moderate	0.1446	Precautionary assessment, assumed field margin present as at U130, although arable within Phase 1 data	Desk study, Phase 1 data 2020.
U145	Woodland and forest	Lowland mixed deciduous woodland	Good	0.6542	Identified as Priority Habitat - Deciduous Woodland on DEFRA Magic Map Application checked 27 December 2022 (data source National Forest Inventory 2020), no field survey.	Desk study, aerial only 2022.

4.3 Hedgerows and Lines of Trees

The Hedgerows and Line of Trees results are detailed within Table 4-2. An overview is provided below, under Hedgerow Type.

Native Hedgerow (all types)

Native Hedgerows include all hedgerows with four or less native woody species and totalled approximately 5.7km within the red line boundary (as defined on 24.11.22). They are predominantly comprised of 'Native Hedgerows' (no trees or banks/ditches) of low distinctiveness⁴ in moderate or good condition, including both field boundary hedges and urban hornbeam hedges, with 'Native hedgerow – Associated with bank or ditch' and 'Native Hedgerow with trees' of medium distinctiveness in moderate or good condition also being present.



Photograph 10: Native Hedgerow in poor condition (H003)

⁴ 'Distinctiveness' is a qualitative description and a numerical value automatically assigned to habitat types within the Biodiversity Metric.



Photograph 11: Native Hedgerow with trees in moderate condition (H011)



Photograph 12: Native Hedgerow – Associated with bank or ditch (H034)

Native Species Rich Hedgerow (all types)

Native Species Rich Hedgerows include all hedgerows with five or more native woody species and totalled approximately 2.67km within the red line boundary (as defined on 24.11.22). They were predominantly comprised of 'Native Species Hedgerows' (no trees or banks/ditches) of medium distinctiveness in moderate or good condition, with 'Native Species Rich Hedgerow – Associated with bank or ditch' and 'Native Species Rich Hedgerow with trees' of high distinctiveness good condition also being present.



Photograph 13: Native Species Rich Hedgerow with trees in good condition (H005)

Line of Trees

Approximately 0.34km Lines of Trees, bordering fields, are present. H009 trees were young and newly planted and therefore in poor condition, while H040 was assessed precautionarily as in good condition, as they were not accessed.

Table 4-2 – Hedgerows and Lines of Trees Results

Hedge number	Hedgerow Type	Length (km)	Condition	Comments (where relevant)	Data Source
H001	Native Species Rich Hedgerow	0.3000	Moderate		Field survey 2022.
H002	Native Species Rich Hedgerow with trees	0.2570	Good		Field survey 2022.
H003	Native Hedgerow	0.1940	Poor		Field survey 2022.
H005	Native Species Rich Hedgerow with trees	0.1460	Good		Field survey 2022.
H007	Native Hedgerow - Associated with bank or ditch	0.2300	Good		Field survey 2022.
H008	Native Species Rich Hedgerow	0.8050	Poor		Field survey 2022.
H009	Line of Trees	0.2410	Poor		Field survey 2022.
H010	Native Hedgerow with trees	0.0240	Moderate		Field survey 2022.
H011	Native Hedgerow with trees	0.1900	Moderate		Field survey 2022.
H012	Native Hedgerow with trees	0.4220	Moderate		Field survey 2022.
H013	Native Hedgerow	0.0100	Moderate		Field survey 2022.
H014	Native Hedgerow with trees	0.0070	Good		Field survey 2022.
H016	Native Hedgerow - Associated with bank or ditch	0.4650	Moderate		Field survey 2022.
H017	Native Hedgerow - Associated with bank or ditch	0.0880	Moderate		Field survey 2022.
H018	Native Hedgerow	0.2550	Moderate		Field survey 2022.

Hedge number	Hedgerow Type	Length (km)	Condition	Comments (where relevant)	Data Source
H019	Native Hedgerow with trees	0.3930	Good		Field survey 2022.
H020	Native Hedgerow with trees	0.2420	Good		Field survey 2022.
H021	Native Hedgerow	0.1700	Good		Field survey 2022.
H022	Native Hedgerow - Associated with bank or ditch	0.2910	Good		Field survey 2022.
H023	Native Species Rich Hedgerow with trees	0.2900	Good		Field survey 2022.
H024	Native Hedgerow	0.4010	Moderate		Field survey 2022.
H025	Native Hedgerow	0.3000	Moderate		Field survey 2022.
H026	Native Hedgerow - Associated with bank or ditch	0.1470	Good		Field survey 2022.
H027	Native Species Rich Hedgerow	0.2070	Good		Field survey 2022.
H028	Native Hedgerow	0.1390	Moderate	Managed species-poor hornbeam hedge.	Field survey 2022.
H029	Native Hedgerow	0.3450	Moderate	Managed species-poor hornbeam hedge.	Field survey 2022.
H030	Native Hedgerow	0.1740	Moderate	Managed species-poor hornbeam hedge.	Field survey 2022.
H032	Native Hedgerow	0.0470	Good		Field survey 2022.
H033	Native Hedgerow	0.7480	Good		Field survey 2022.

Hedge number	Hedgerow Type	Length (km)	Condition	Comments (where relevant)	Data Source
H034	Native Hedgerow - Associated with bank or ditch	0.2580	Moderate		Field survey 2022.
H035	Native Species Rich Hedgerow - Associated with bank or ditch	0.1280	Good		Field survey 2022.
H036	Native Hedgerow	0.0270	Moderate	Managed species-poor hornbeam hedge.	Field survey 2022.
H037	Native Hedgerow with trees	0.1210	Good	Precautionary assessment.	Desk study, Phase 1 data 2020.
H038	Native Species Rich Hedgerow	0.0570	Good	Precautionary assessment.	Desk study, Phase 1 data 2020.
H039	Native Species Rich Hedgerow	0.2490	Good	Precautionary assessment.	Desk study, Phase 1 data 2020.
H040	Line of Trees	0.1010	Good	Precautionary assessment.	Desk study, Phase 1 data 2020.
H041	Native Species Rich Hedgerow	0.2350	Good	Precautionary assessment.	Desk study, Phase 1 data 2020.



4.4 Rivers and Streams

River Condition Assessment

Table 4-3 details the preliminary condition score for D1 River Granta at Babraham (Reach D01 sampled) and D2 River Grant at Stapleford (Reach D02 sampled), with the score for each positive and negative indicator provided. In Table 4-4, The 'Final Condition Class', which takes into account variables used in the preliminary condition score and variables used to assess the River Type of Reaches D01 and D02, classifies the condition of D1 and D2 as Fairly Poor to Moderate.

A legacy of channel modifications in England is the existence of channels that are 'overdeep' such that they are to some extent hydrologically and thus ecologically disconnected from their riparian margins and floodplains (Modular River Survey, Undated). Overdeep channels may support a diverse range of physical habitats but if these are hydrologically disconnected to some degree it reduces their potential to support biodiversity (Modular River Survey, Undated). D1 and D2 are considered likely to be overdeep, as the River Shape score is <4 (and typically <2) for each Reach. However, D1 is less overdeep than D2, and the River Shape may typically score higher in years where rainfall is higher, as the average water depth is part of the River Shape calculation⁵.

The Biodiversity Metric 3.1 Technical Supplement (Panks et al. 2022b, p.25) states, *"In cases where the final condition is estimated to be Good or Fairly Good for river types D to M, a final stage is to consider the likely hydrological connectivity among the habitats that are present. If the surveyed channels are identified as being too deep relative to their width to be fully hydrologically connected, the final condition is downgraded from Good to Fairly Good or from Fairly Good to Moderate"*. However, the River Module Survey (Undated) does not specify that this only applies for Good or Fairly Good final condition assessments, but acknowledges that *"If the presence of an overdeep channel seems to be a reasonable judgement, then the RCA [river condition assessment] for your site should be reduced by one class (e.g. from Good to Fairly Good, or from Moderate to Fairly Poor) when it is entered into the BM3.0 [Biodiversity Metric] spreadsheet."* Therefore, as D1 and D2 appear to be overdeep and have a final condition score ranging from Fairly Poor to Moderate, an overall classification of the condition assessment for D1 and D2 as Fairly Poor is considered reasonable.

⁵ Average width = Average MoRPh width. River shape = (Average MoRPh width) / (Average (water depth+lower bank height)).



Table 4-3 - Preliminary Condition Scores

*Positive indicators score 0 to +4 and reflect 'natural' elements. Scores 0, 1 or 2 are in bold as these may be susceptible to improvement as a result of project design implementation or may self-adjust following implementation.

**Negative indicators score 0 to -4 and reflect human pressures and interventions. Scores -3 and -4 are in bold, as these are susceptible to changes as a result of project design-implementation.

***NNIPS is Non-native invasive plant species. Himalayan balsam was present on the bank face, bank top and channel face in several modules, particularly in D02, but also present at D01.

****E10 -4 score because of Major weir (permanent, impermeable, impounding structure across entire channel width).

Reach	D01			D02		
	S01	S02	S03	S01	S02	S03
Subreach	S01	S02	S03	S01	S02	S03
Preliminary Condition Score	0.19	1.40	0.53	0.91	0.41	0.41
River Shape	2.25	2.47	1.84	1.74	1.66	1.66
Average width (m)	5.00	4.60	5.00	4.60	5.00	5.00
Average of positive indicators	1.58	1.63	1.53	1.53	0.95	0.95
Average of negative indicators	-1.38	-0.23	-1.00	-0.62	-0.54	-0.54
A6: Bedrock Reaches	No	No	No	No	No	No
A7: Coarsest Bed Material Size	Cobble	Cobble	Bed not visible	Cobble	Sand	Sand
A8: Average alluvial bed material size class	Sand	Gravel/pebble	Bed not visible	Gravel/pebble	Sand	Sand
Positive indicators*	B1: Bank top vegetation structure	2	2	2	2	2
	B2: Bank top tree feature richness	0	0	0	0	0
	B3: Bank top water-related features	0	0	0	0	0



Reach	D01			D02			
	S01	S02	S03	S01	S02	S03	
Subreach	S01	S02	S03	S01	S02	S03	
Negative indicators**	B4: Bank top NNIPS Cover	0	0	0	0	0	
	B5: Bank top managed ground cover	-3	-2	-2	-3	-2	-2
Positive indicators	C1: Bank face riparian vegetation structure	1	2	2	2	2	
	C2: Bank face tree feature richness	1	2	2	1	1	
	C3: Bank face natural bank profile richness	2	2	2	1	0	
	C4: Bank face natural bank profile richness	2	3	3	2	0	0
	C5: Bank face natural bank material richness	3	1	1	1	1	1
	C6: Bank face bare sediment extent	4	4	4	3	1	1
Negative indicators	C7: Bank face artificial bank profile extent	-2	0	-2	-2	-2	
	C8: Bank face reinforcement extent	-2	0	-2	0	0	
	C9: Bank face reinforcement material severity	-1	0	-2	0	0	
	C10: Bank face NNIPS*** cover	-1	-1	0	-2	-2	

Reach		D01				D02			
		S01	S02	S03	S01	S02	S03	S01	S02
Positive indicators	D1: Channel margin aquatic vegetation extent	2	2	2	2	2	2	2	2
	D2: Channel margin aquatic morphotype richness	2	2	2	2	2	2	2	2
	D3: Channel margin physical feature extent	2	3	2	1	1	2	1	1
	D4: Channel margin physical richness	2	2	1	2	1	1	1	1
	D5: Channel margin artificial features	-2	0	-1	0	0	-1	0	0
Negative indicator	E1: Channel aquatic morphotype richness	1	0	2	3	2	3	3	3
	E2: Channel bed tree features	2	2	2	1	2	1	1	1
	E3: Channel bed hydraulic features richness	1	1	2	1	2	1	1	0
	E4: Channel bed natural features extent	0	0	0	2	0	0	2	0
	E5: Channel bed natural features richness	0	0	0	0	0	0	1	0

Reach		D01				D02			
		S01	S02	S03	S01	S02	S03	S01	S02
Negative indicators	E6: Channel bed material richness	3	3	0	3	0	3	3	1
	E7: Channel bed siltation	-2	0	0	0	0	0	0	0
	E8: Channel bed reinforcement extent	-1	0	0	0	0	0	0	0
	E9: Channel bed reinforcement severity	-2	0	0	0	0	0	0	0
	E10: Channel bed artificial features severity****	0	0	-4	0	0	-4	0	0
	E11: Channel bed NNIPs extent	-1	0	0	-1	0	0	-1	0
	E12: Channel bed filamentous algae extent	0	0	0	0	0	0	0	-1

Table 4-4 - Final Condition Scores (bold where river shape is <4, considered overdeep)

Reach	D01			D02		
	S01	S02	S03	S01	S02	S03
Subreach	S01	S02	S03	S01	S02	S03
River Category	Other	Other	Other	Other	Other	Other
A1: Braiding Index	1	1	1	1	1	1
A2: Sinuosity Index	1.09	1.09	1.09	1.05	1.05	1.05
A3: Anabranching Index	1	1	1	1	1	1
A4: Level of Confinement	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined	Unconfined
A5: Reach Valley Gradient	0.0019	0.0019	0.0019	0.0006	0.0006	0.0006
A6: Bedrock Reach	No	No	No	No	No	No
A7 Coarsest Bed Material	Cobble	Cobble	Cobble	Cobble	Cobble	Cobble
A8: Average Bed Material	Sand	Sand	Sand	Sand	Sand	Sand
River Type	H	H	H	H	H	H
River Shape	2.25	2.47	1.84	1.74	1.66	1.66
Average Width (m)	5	4.6	5	4.6	5	5
Preliminary Condition Score	0.19	1.4	0.53	0.91	0.41	0.41
Final Condition Class	Fairly Poor	Moderate	Moderate	Moderate	Fairly Poor	Fairly Poor
Adjusted condition for overdeepness	Fairly Poor	Fairly Poor	Fairly Poor	Fairly Poor	Fairly Poor	Fairly Poor

Rivers and Streams, including Condition Assessments for Ditches for use with the Biodiversity Metric

Table 4-5 details the Rivers and Streams pre-development ecological baseline for use with the Biodiversity Metric. Approximately 3.39km of Rivers and Streams are present within the red line boundary (as defined on 24.11.22), of which 0.85km are classified as ‘Other Rivers and Streams’ and 2.54km are classified as ‘Ditches’.

The ‘Other Rivers and Streams’ consist of D1 River Granta at Babraham and D2 River Grant at Stapleford which were subject to the River Condition Assessment (discussed above). Although the river condition varies depending on the individual subreach, the condition assessment of ‘fairly poor’ has been selected as representative of the whole of D1 and D2 within the red line boundary (discussed under River Condition Assessment).



Photograph 14: Highly modified section of D1 with hard structures (subreach 1, module 1)



Photograph 15: Typical section of D1 (subreach 2)



Photograph 16: Typical section of D2 (subreach 1)

The 'Ditches' are predominantly in poor condition, with the occasional ditch in moderate condition. Where ditches have been assessed as in good condition, this is a precautionary assessment as they were outside the boundary (based on the red line boundary version of RLB 26.09.11) used for BNG field surveys. Dry ditches have been included as a precaution in the River and Streams assessment as the low rainfall levels in 2022 were considered likely to cause ditch drying, which may be atypical for that ditch.

Table 4-5 – Rivers & Streams Pre-Development Ecological Baseline Results

BNG Ref	River type	Length (km)	Condition	Comments (where relevant)
W01	Ditches	0.0110	Poor	Wet ditch.
D4	Ditches	0.1440	Moderate	Connected to spring. Water levels normally higher. Hobson's Conduit at Nine Wells (spring fed).
W02	Ditches	0.1530	Moderate	Dry currently, water levels normally higher. Abundant Phragmites.
D2	Other Rivers and Streams	0.5130	Fairly poor	Fairly poor to poor - see individual subreach assessments for Reach D01. Assigned the higher condition assessment overall to be precautionary. River Granta at Stapleford
W03	Ditches	0.1210	Poor	No water. Dry ditch. Precautionary assessment as may hold water in more typical rainfall years.
D2E	Ditches	0.2410	Poor	No water visible. Choked with scrub. Ditch very steep sided. 50% bordered by trees. Drainage Ditch at Sawston
W04	Ditches	0.1750	Poor	50-100%, choked by common reed.
D1	Other Rivers and Streams	0.3360	Fairly poor	Fairly poor to poor - see individual subreach assessments for Reach D02. Assigned the higher condition assessment overall to be precautionary. River Granta at Babraham
W06	Ditches	0.4680	Poor	Precautionary. Currently dry, but in past recorded with water. Drought year.
W07	Ditches	0.0200	Poor	Dry ditch, no access as runs under hardstanding/railway.
W08	Ditches	0.1530	Poor	Wet ditch.
W09	Ditches	0.0120	Moderate	Wet ditch
D5A	Ditches	0.1590	Poor	Dry ditch, not accessed for condition assessment as on the site periphery. Assessment based on observations during other surveys. Adjacent to woodland.

BNG Ref	River type	Length (km)	Condition	Comments (where relevant)
W22	Ditches	0.1180	Good	Precautionary assessment, as no field survey for BNG purposes as outside the boundary (based on the red line boundary version of RLB 26.09.11) used for field survey.
W27	Ditches	0.1750	Good	Precautionary assessment, as no field survey for BNG purposes as outside the boundary (based on the red line boundary version of RLB 26.09.11) used for field survey.
W24	Ditches	0.0990	Poor	No water. Dry ditch. Precautionary assessment as may hold water in more typical rainfall years.
W29	Ditches	0.0240	Poor	Artificial wet ditch.
W05	Ditches	0.4690	Poor	No water. Dry ditch. Precautionary assessment as may hold water in more typical rainfall years.

5 High-level Interpretation

5.1 Habitat Areas

Impacts to habitats of higher distinctiveness should be avoided in the first instance, particularly ‘Lowland mixed deciduous woodland’ (high distinctiveness) and ‘other woodland; broadleaved’ (medium distinctiveness). However, in areas where plantation is young and/or has failed and are in poor condition, reinstatement of ‘other neutral grassland’ habitats (medium distinctiveness) and managed to ‘good’ condition may be appropriate. While usually habitat creation should be like-for-like (e.g. woodland lost, woodland creation), the wider landscape ecological connectivity should also be taken into account when designing post-development habitats.

Due to changes to the red line boundary, some areas were not covered by the habitat type and condition surveys in 2022, but were largely covered by Phase 1 habitat data from 2020. However, a small area of woodland (U145, TL 50623 49447) now lies in the temporary land take within the red line boundary and was not part of the 2020 surveys. It has been assigned a habitat type of ‘Lowland mixed deciduous woodland’ (based on Magic Map Application) and a precautionary condition assessment of ‘good’. If this woodland is impacted for temporary compounds/storage/haulage it would be counted within the permanent loss figures as it could not be restored quickly enough to be a ‘temporary’ impact eligible for exclusion under the metric guidance⁶. Therefore, this woodland should be avoided in the first instance and, if it cannot be, detailed habitat surveys are likely to be required to inform a suitable mitigation strategy.

There are limited opportunities to enhance grassland roadside verges, field margins or amenity grassland, which are largely present in strips of <0.1ha. However, some enhancement could be achieved through long term management to reduce soil fertility to increase species diversity.

⁶ The temporary loss option is only available for disturbed habitats that can be restored (in full) to their baseline condition (or better) within 2 years from the date of impact. Where the habitat cannot be restored to its baseline value within 2 years from the date of impact this should be recorded as a loss of baseline habitat and creation of the replacement habitat (Panks et al, 2022a).

The largest continuous area of grassland (approximately 1.18ha), is U024 'Modified grassland' in the southeast of the scheme; this could be enhanced through reductions in soil fertility and wildflower sowing or creation of a wetland area. The creation of wetland and improvements to the riparian corridor in this area would also improve the habitat condition of watercourse D1 (as habitat improvements within 10m of a watercourse can be included within both the Habitat Area metric and the Rivers and Streams metric).

5.2 Hedgerows and Lines of Trees

The severing or removal of hedgerows and lines of trees should be avoided in the first instance, as they provide connectivity to the wider landscape. However, native hedgerows can be enhanced through planting additional native species within the hedge, and hedgerows generally on-site can be improved through widening and creation of field margins, and management to reduce the presence of undesirable species such as cleavers *Galium aparine* and common nettle *Urtica dioica* within and adjacent to the hedge. The survey proformas provide more detailed information to inform the enhancement of individual hedgerows, as they include the individual scores against each assessment criteria.

5.3 Rivers and Streams

Dry ditches have been included as a precaution in the River and Streams assessment as the low rainfall levels in 2022 were considered likely to cause ditch drying which may be atypical for that ditch. However, such ditches can be removed from the Rivers and Streams metric if they do not hold water in 2023, in which case they would be discounted from the Biodiversity Metric except where they are in association with a hedgerow, i.e. under categories 'Native Species Rich Hedgerow/Native Hedgerow – Associated with bank or ditch'. Dry ditches could however be enhanced to become wet ditches as part of habitat creation, or where they hold water enhanced with their condition improved from poor to moderate through vegetation clearance and reprofiling. The survey proformas provide more detailed information to inform the enhancement of individual ditches, as they include the individual scores against each assessment criteria.

The River Granta at D1 and D2 are considered likely to be overdeep, as the River Shape score is <4 (and typically <2) for each Reach, which contributes to a condition assessment of Fairly Poor. However, D1 is less overdeep than D2, and the River Shape may typically score higher in years where rainfall is higher, as the average water depth is part of the River Shape calculation. Therefore, if the River Granta is typically deeper in subsequent years, the river condition baseline assessment for D1 may be upgraded to Moderate overall. Reprofiling of the banksides is likely to improve the condition assessment (reducing overdeepness), by increasing hydrological/ecological lateral connectivity. During the scheme design process, a geomorphologist should be consulted on the appropriateness and feasibility of proposed interventions to Rivers and Streams. The pre- and post-development River Condition Assessment calculation does not override the professional judgement of the geomorphologist.

Positive indicators which scored 0 to 2 for D1 and D2 may be susceptible to improvement, include:

- B1: Bank top vegetation structure
- B2: Bank top tree feature richness
- B3: Bank top water-related features
- C1: Bank face riparian vegetation structure
- C2: Bank face tree feature richness
- C3: Bank face natural bank profile richness
- C4: Bank face natural bank profile richness
- C5: Bank face natural bank material richness
- D1: Channel margin aquatic vegetation extent
- D2: Channel margin aquatic morphotype richness
- D3: Channel margin physical feature extent
- D4: Channel margin physical richness
- E1: Channel aquatic morphotype richness
- E2: Channel bed tree features
- E3: Channel bed hydraulic features richness
- E4: Channel bed natural features extent
- E5: Channel bed natural features richness

Negative indicators which scored -3 and -4 for D1 and D2 may be susceptible to improvement, include:

- B5: Bank top managed ground cover
- E10: Channel bed artificial features severity (D1 only), relating to the presence of a weir.

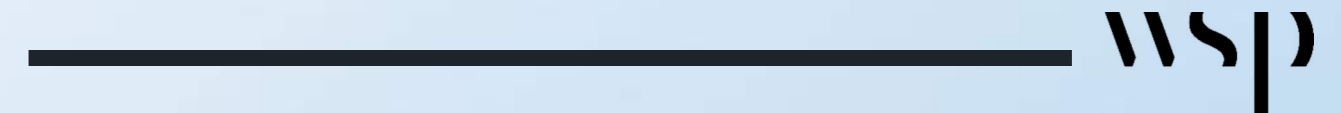
There are small clusters of Himalayan balsam *Impatiens glandulifera*, an invasive plant species listed under Schedule 9 of the Wildlife & Countryside Act 1981 (as amended) present along D1 and D2. While this is not yet scoring at -3 or -4, this species will continue to spread without management, and should therefore be part of any mitigation and/or enhancement scheme for Rivers and Streams. Further sampling of Reaches D01 and D02 may be required, as the Reaches extend several kilometres beyond the red line boundary, if off-site habitat mitigation is proposed.






6 References

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Appendix A

Survey Extent: Habitat types and condition assessments carried out by field survey or desktop study



-  Red line boundary on 24.11.22
-  Field survey area and 26.09.22 red line boundary
-  Aerial only based assessment
-  Phase 1 habitat survey and aerial based assessment
-  Area which includes unsurveyed woodland, assign precautionary assessment of good

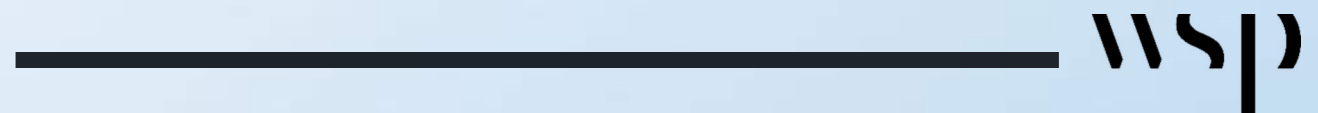
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Client Greater Cambridgeshire Partnership			
Project Cambridge South East Transport (CSET) Phase 2			
Drawing Survey Extent: Habitat types and condition assessments carried out by field survey or desktop study.			
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Project No ED/000553	Date 22/12/2022		Revision P01.1
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Appendix B

River Condition Assessment Survey Extent

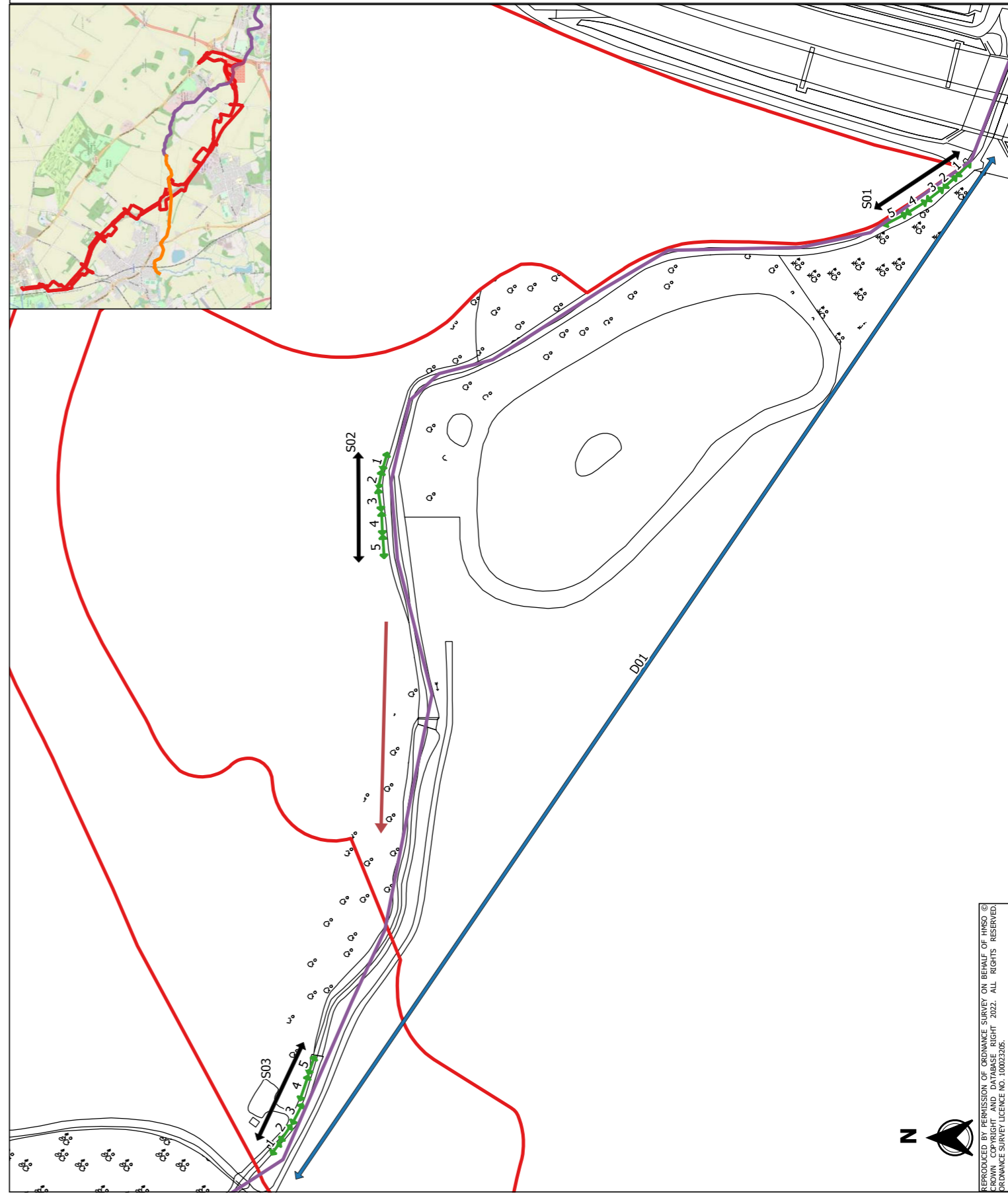




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Reach D02	Dwn	Chkd
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	Classification Commercial in Confidence	
	Client Greater Cambridgeshire Partnership	
	Project Cambridge South East Transport (CSET) Phase 2	
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		Approved
		TB
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ED/000553		
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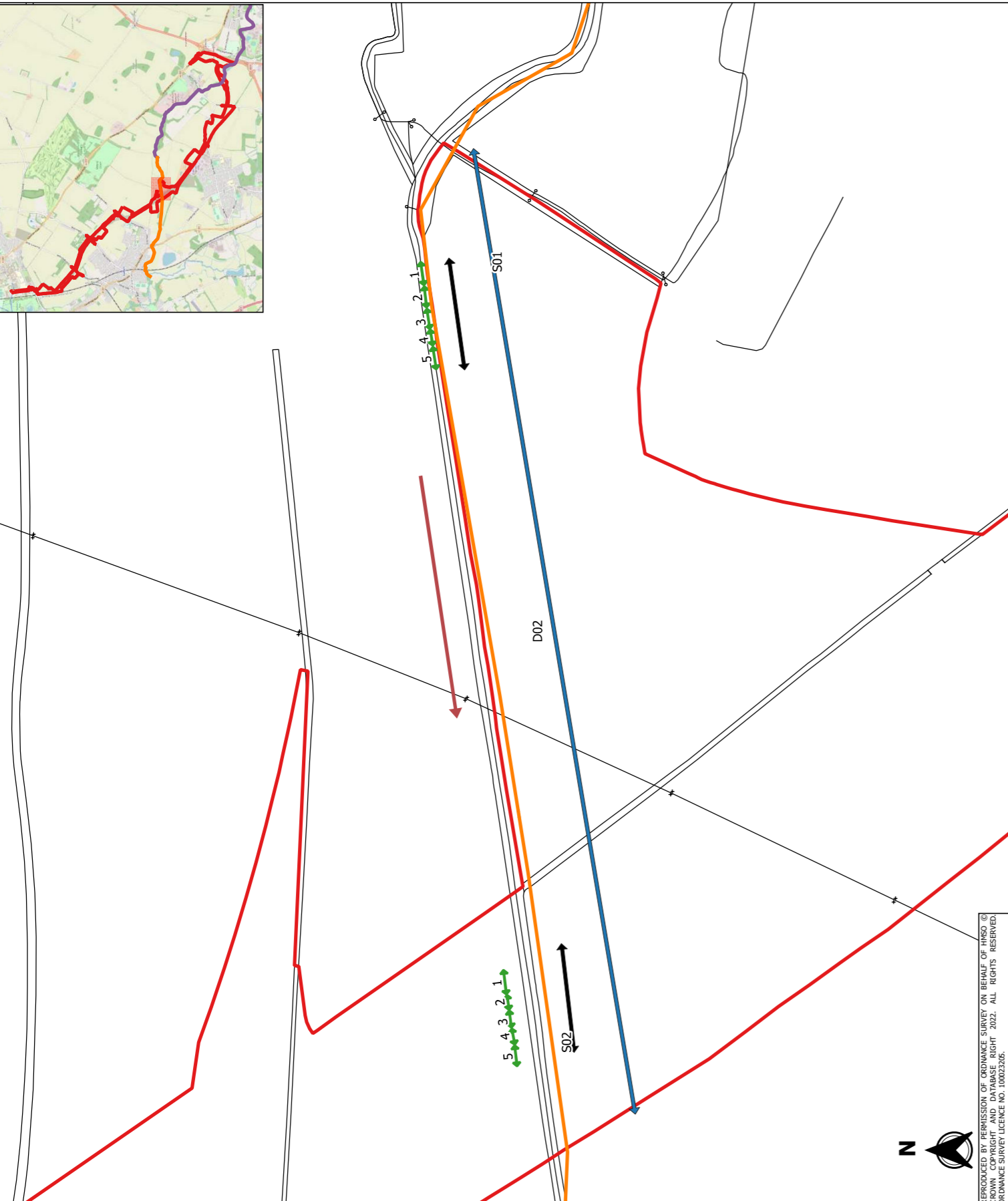
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Subreach	Dwn	Chkd
Modules 1 to 5	Purpose of Issue S2 - Issued for Information	
Sampled length of Reach D01 (D1)	Classification Commercial in Confidence	
Reach D02	Client Greater Cambridgeshire Partnership	
Flow direction	Project Cambridge South East Transport (CSET) Phase 2	
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Red line boundary 24.11.22
 Reach D02
 Subreach
 Modules 1 to 5
 Reach D01
 Sampled length of Reach D02 (D2)
 Flow direction

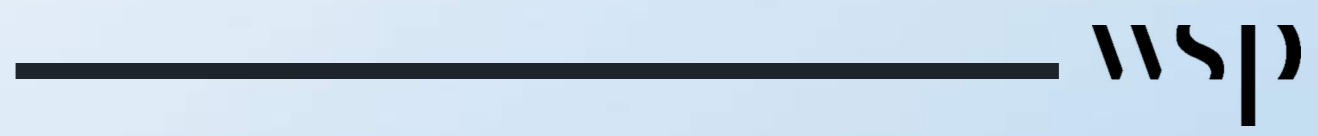
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Appendix C

Pre-Development Ecological Baseline by Habitat Type - Maps



Red line boundary on 24.11.22

Habitat Areas

- Arable field margins
- Cereal crops
- Developed land sealed surface
- Lowland mixed deciduous woodland
- Mixed scrub
- Modified grassland
- Non-cereal crops
- Other neutral grassland
- Other woodland broadleaved
- Other woodland mixed
- Ponds (Non- Priority Habitat)
- Urban Tree
- Vacant/derelict land/ bareground

Rivers & Streams

- Ditches
- Other Rivers and Streams

Hedgerows/Line of Trees

- Line of Trees
- Native Hedgerow (all types)
- Native Species Rich Hedgerow (all types)

Purpose of Issue
S2 - Issued for Information

Classification
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Client
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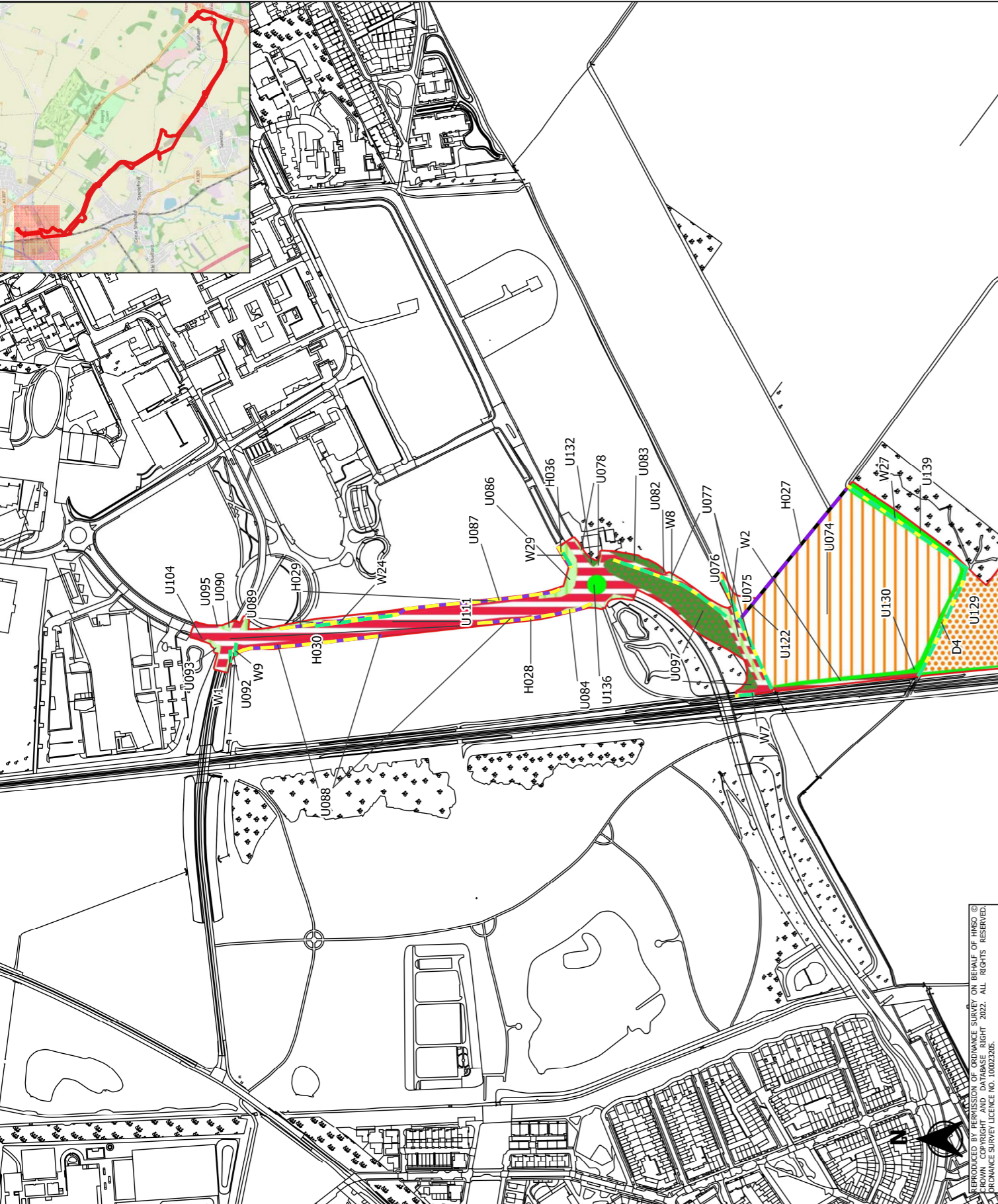
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Red line boundary on 24.11.22

Habitat Areas

- Arable field margins
- Cereal crops
- Developed land sealed surface
- Lowland mixed deciduous woodland
- Mixed scrub
- Modified grassland
- Non-cereal crops
- Other neutral grassland
- Other woodland broadleaved
- Other woodland mixed
- Ponds (Non- Priority Habitat)
- Urban Tree
- Vacant/derelict land/ bareground

Rivers & Streams

- Ditches
- Other Rivers and Streams

Hedgerows/Line of Trees

- Line of Trees
- Native Hedgerow (all types)
- Native Species Rich Hedgerow (all types)

Purpose of Issue
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Client
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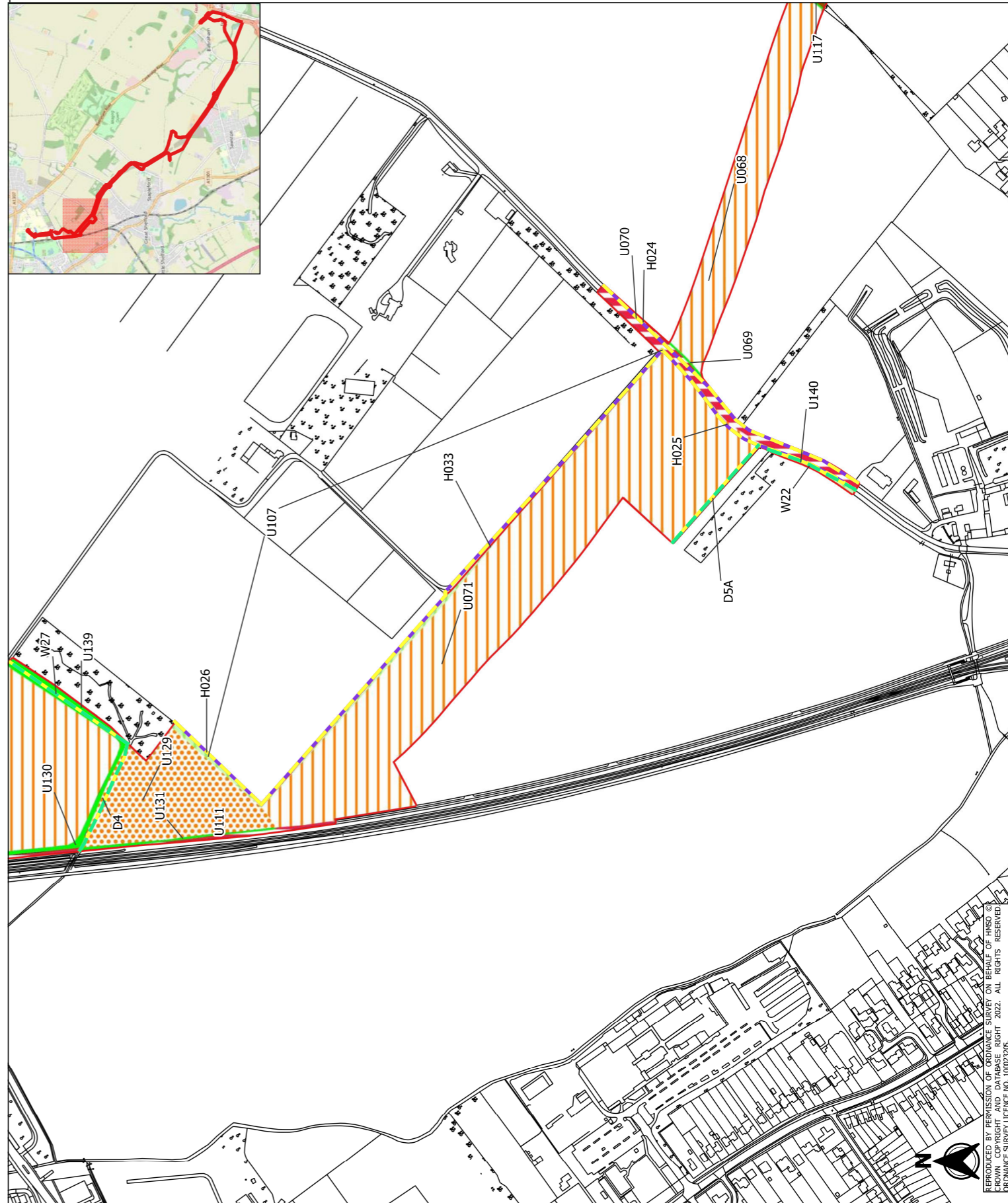
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Red line boundary on 24.11.22

Habitat Areas

- Arable field margins
- Cereal crops
- Developed land sealed surface
- Lowland mixed deciduous woodland
- Mixed scrub
- Modified grassland
- Non-cereal crops
- Other neutral grassland
- Other woodland broadleaved
- Other woodland mixed
- Ponds (Non- Priority Habitat)
- Urban Tree
- Vacant/derelict land/ bareground

Rivers & Streams

- Ditches
- Other Rivers and Streams

Hedgerows/Line of Trees

- Line of Trees
- Native Hedgerow (all types)
- Native Species Rich Hedgerow (all types)

Purpose of Issue
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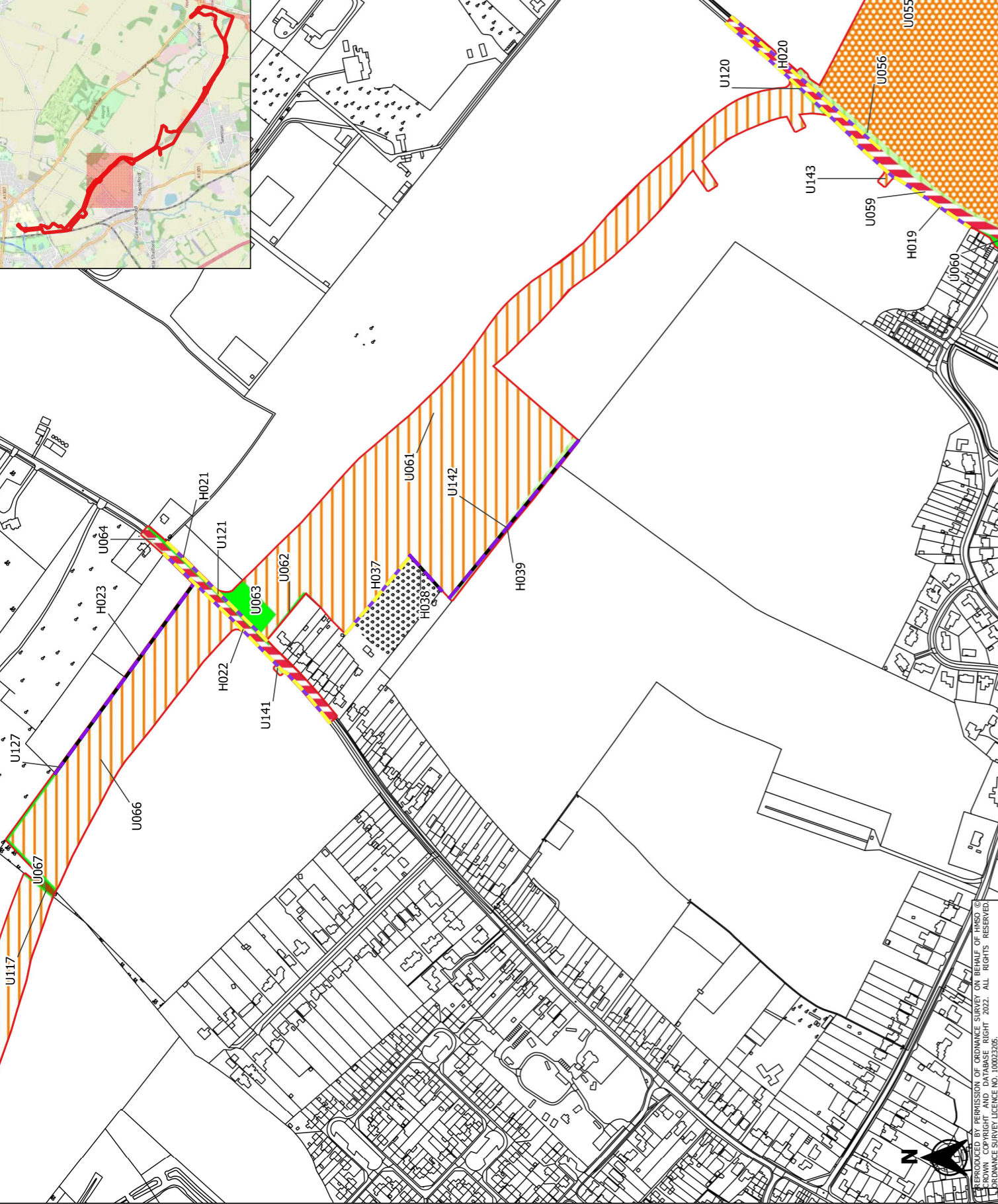
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Red line boundary on 24.11.22

Habitat Areas

- Arable field margins
- Cereal crops
- Developed land sealed surface
- Lowland mixed deciduous woodland
- Mixed scrub
- Modified grassland
- Non-cereal crops
- Other neutral grassland
- Other woodland broadleaved
- Other woodland mixed
- Ponds (Non- Priority Habitat)
- Urban Tree
- Vacant/derelict land/ bareground

Rivers & Streams

- Ditches
- Other Rivers and Streams

Hedgerows/Line of Trees

- Line of Trees
- Native Hedgerow (all types)
- Native Species Rich Hedgerow (all types)

Purpose of Issue
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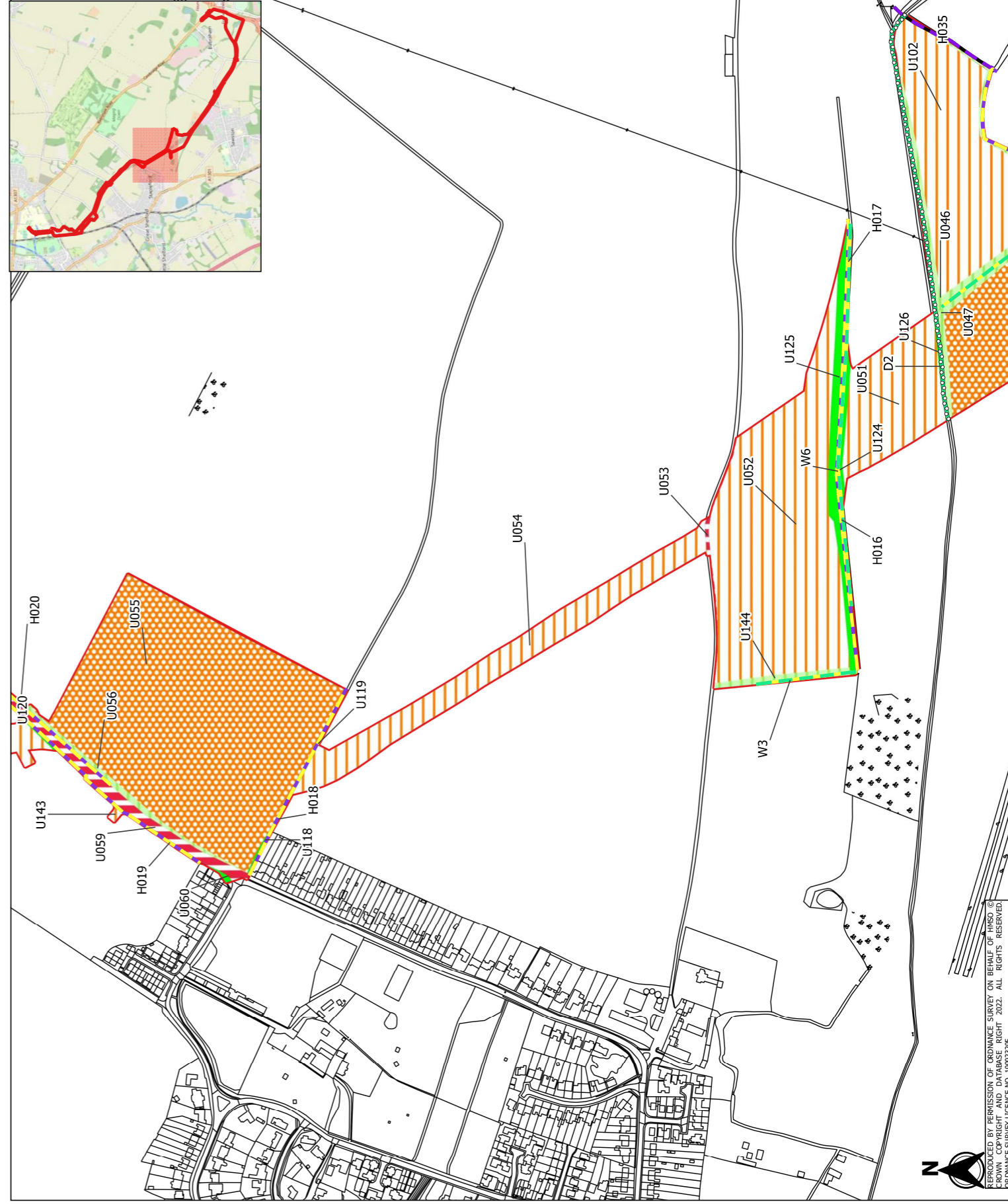
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Client
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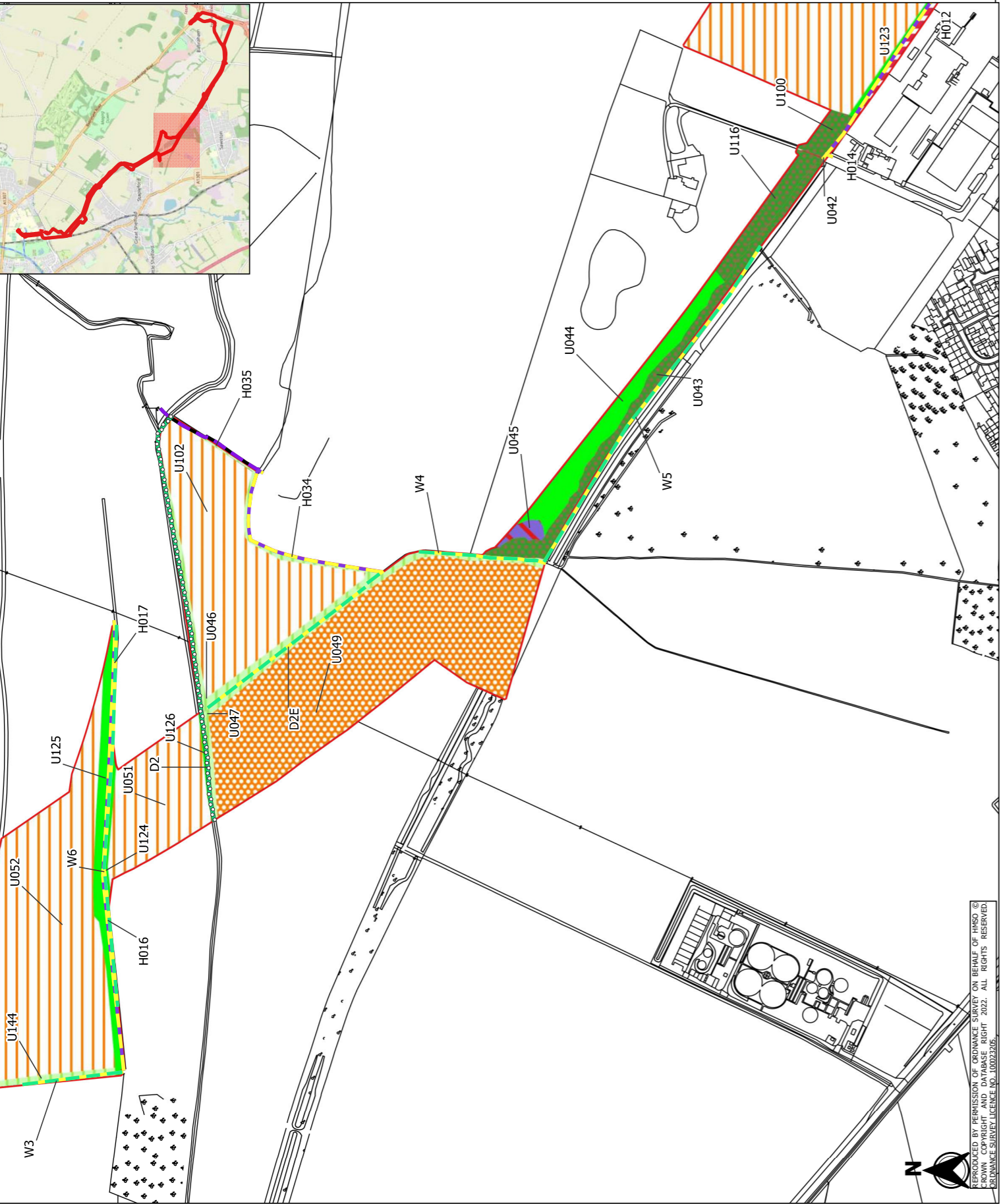
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Red line boundary on 24.11.22

Habitat Areas

- Arable field margins
- Cereal crops
- Developed land sealed surface
- Lowland mixed deciduous woodland
- Mixed scrub
- Modified grassland
- Non-cereal crops
- Other neutral grassland
- Other woodland broadleaved
- Other woodland mixed
- Ponds (Non- Priority Habitat)
- Urban Tree
- Vacant/derelict land/ bareground

Rivers & Streams

- Ditches
- Other Rivers and Streams

Hedgerows/Line of Trees/

- Line of Trees
- Native Hedgerow (all types)
- Native Species Rich Hedgerow (all types)

Purpose of Issue
S2 - Issued for Information

Classification
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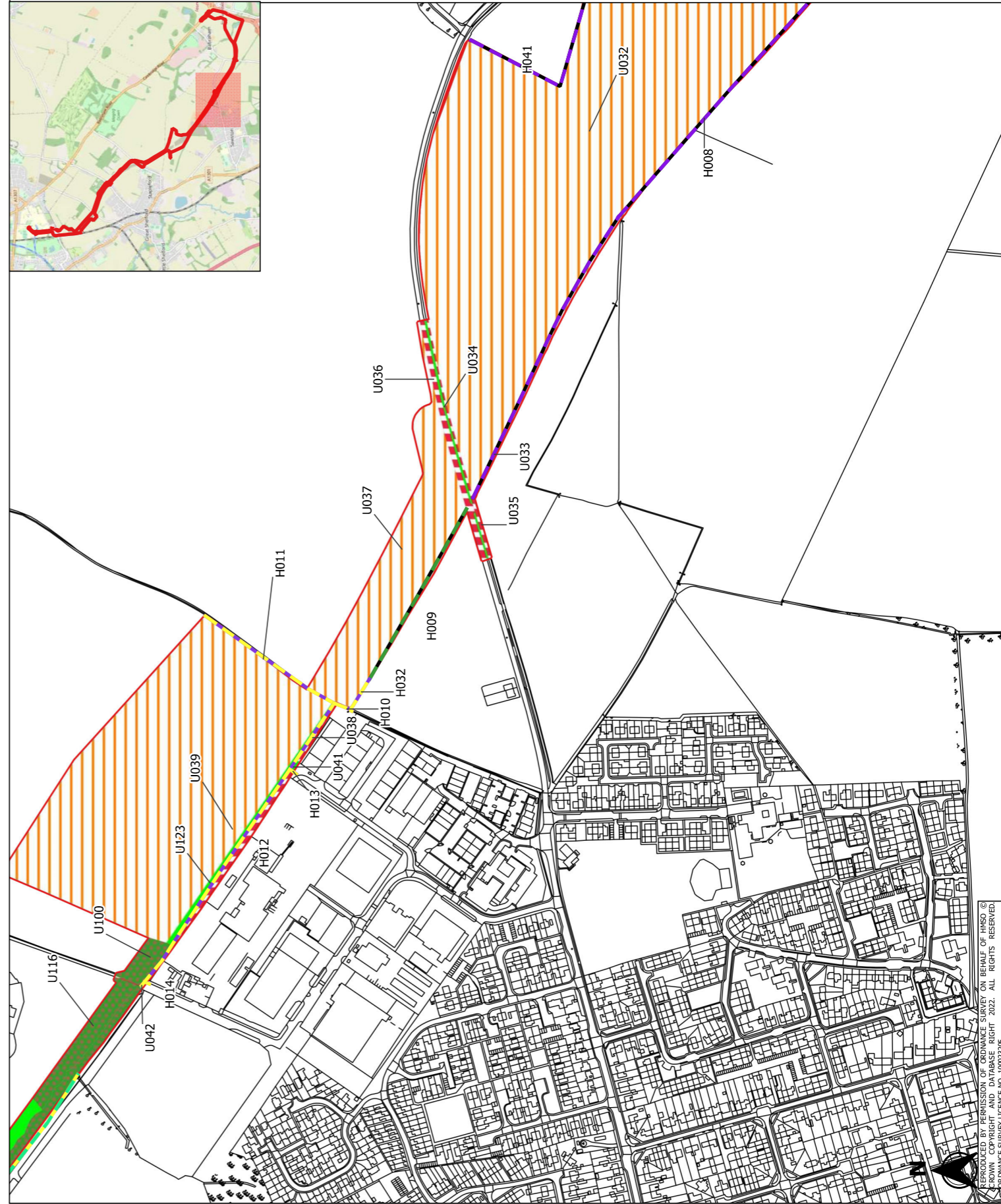
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Red line boundary on 24.11.22

Habitat Areas

- Arable field margins
- Cereal crops
- Developed land sealed surface
- Lowland mixed deciduous woodland
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- Modified grassland
- Non-cereal crops
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- Other woodland broadleaved
- Other woodland mixed
- Ponds (Non- Priority Habitat)
- Urban Tree
- Vacant/derelict land/ bareground

Rivers & Streams

- Ditches
- Other Rivers and Streams

Hedgerows/Line of Trees/

- Line of Trees
- Native Hedgerow (all types)
- Native Species Rich Hedgerow (all types)

Purpose of Issue
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Pre-development ecological baseline by habitat type
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Red line boundary on 24.11.22

Habitat Areas

- Arable field margins
- Cereal crops
- Developed land sealed surface
- Lowland mixed deciduous woodland
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- Modified grassland
- Non-cereal crops
- Other neutral grassland
- Other woodland broadleaved
- Other woodland mixed
- Ponds (Non- Priority Habitat)
- Urban Tree
- Vacant/derelict land/ bareground

Rivers & Streams

- Ditches
- Other Rivers and Streams

Hedgerows/Line of Trees

- Line of Trees
- Native Hedgerow (all types)
- Native Species Rich Hedgerow (all types)

Purpose of Issue
S2 - Issued for Information

Classification
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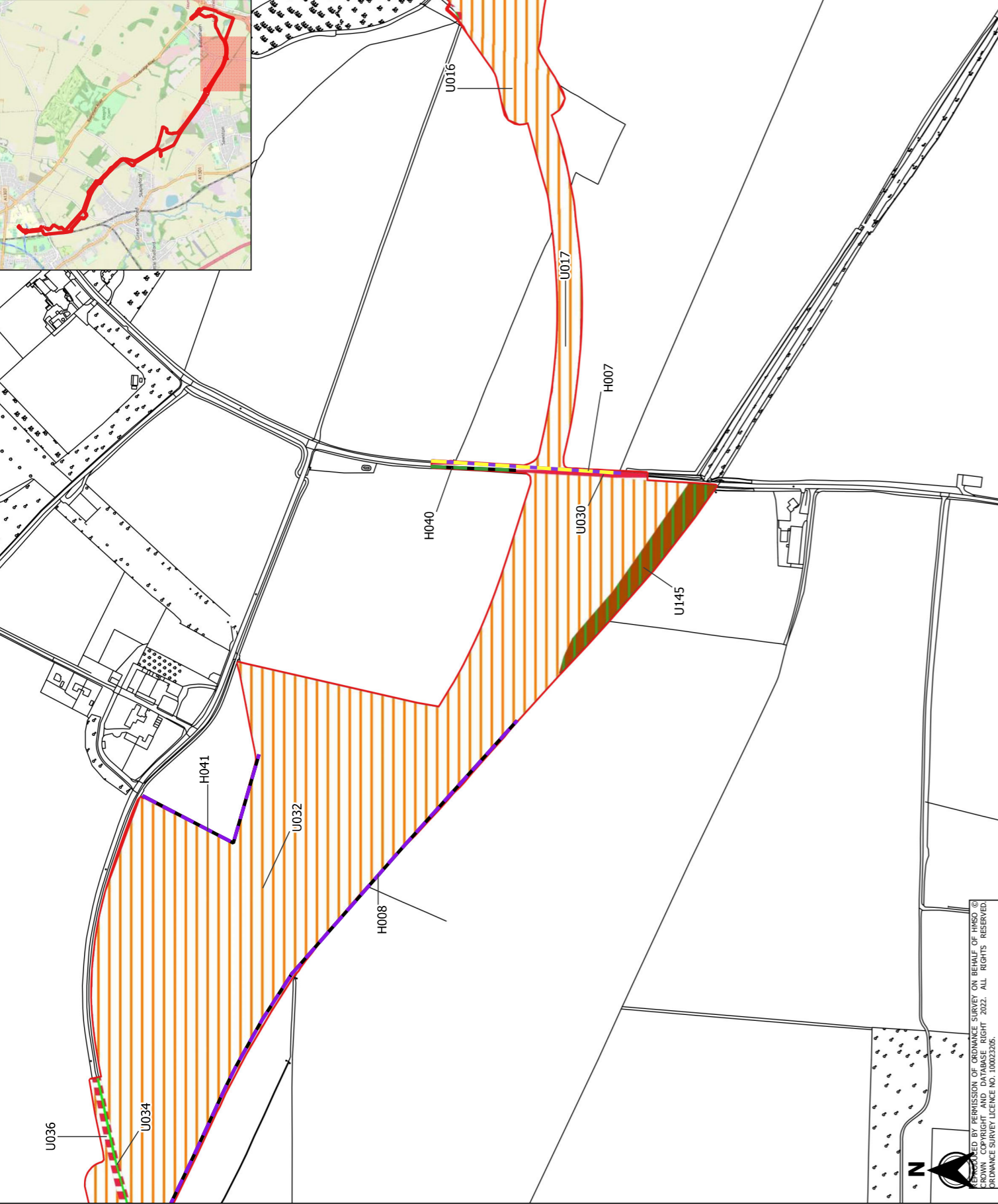
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Drawing
Pre-development ecological baseline by habitat type
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Red line boundary on 24.11.22

Habitat Areas

- Arable field margins
- Cereal crops
- Developed land sealed surface
- Lowland mixed deciduous woodland
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- Vacant/derelict land/ bareground

Rivers & Streams

- Ditches
- Other Rivers and Streams

Hedgerows/Line of Trees

- Line of Trees
- Native Hedgerow (all types)
- Native Species Rich Hedgerow (all types)

Purpose of Issue
S2 - Issued for Information

Classification
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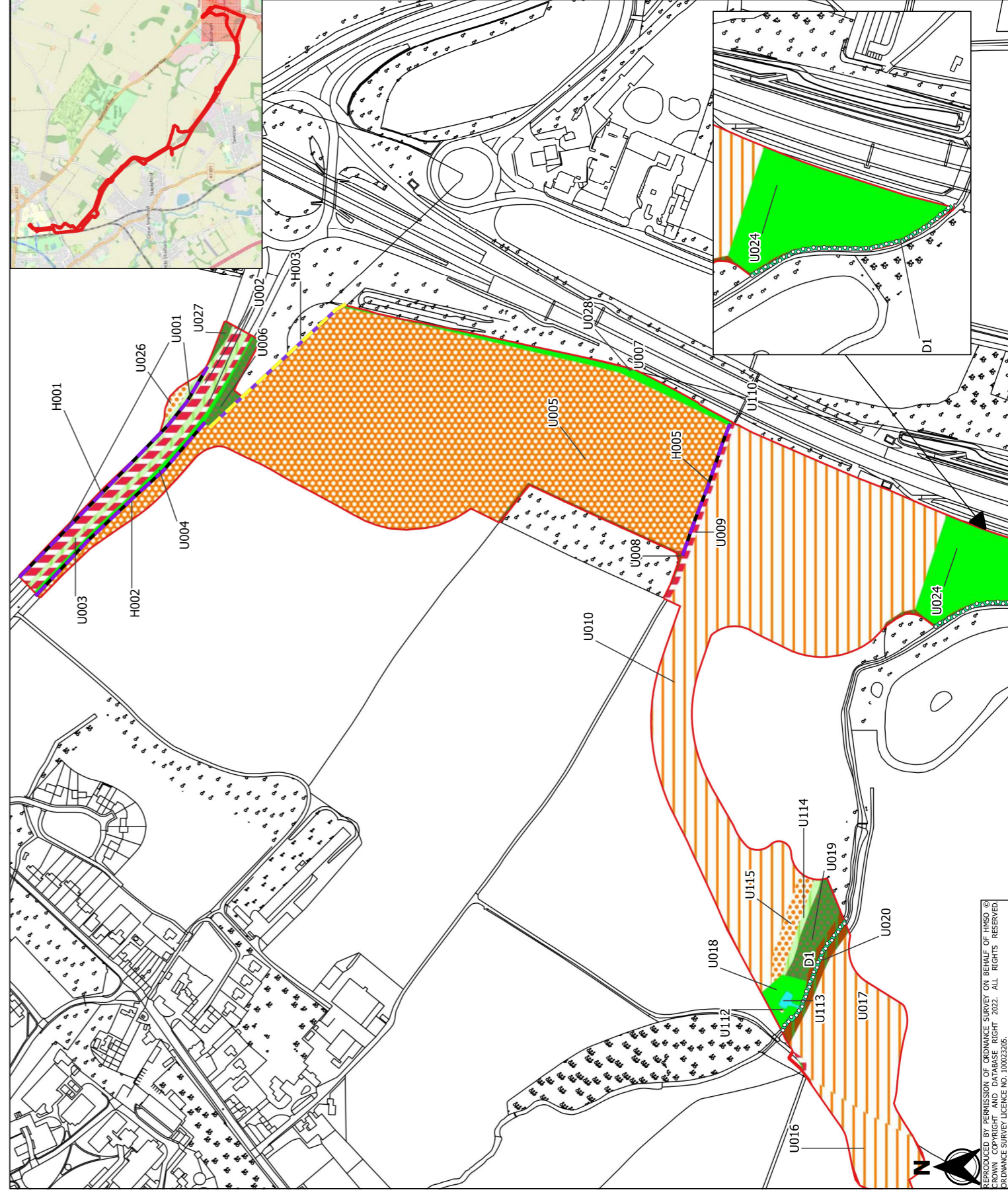
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Drawing
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Page 8 of 8

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Cambridge South East Transport Strategy (CSET)

Hedgerow Regulations Survey Report



Greater Cambridgeshire Partnership

June 2020

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Version:	Date:	Updated by:	Verified by:	Description of changes:
V2	11.03.20	Tim Rich	Clare May	Changes following review by client
V3	06.04.20	David Goddard	Elizabeth Sanders	Changes requested by Cambridgeshire County Council
V4	18.06.20	David Goddard	Elizabeth Sanders	Further changes requested by Cambridgeshire County Council

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FIGURES

Figure 1 – Hedges surveyed for the Hedgerow Regulations

Figure 2 – Route options

Appendix A – Report Conditions

Appendix B – Summary of hedgerow Regulations 1997

Appendix C – Standard form used to collect Hedgerow Regulations data

Appendix D – Summary of hedgerow survey data

Executive Summary

Contents	Summary
Site Location	The site comprises a linear route which extends from the Cambridge Biomedical Campus in Cambridge, through to the A11 beyond the village of Babraham. The site is centred at Ordnance Survey National Grid Reference (OSNGR) TL 48499 51169. The most north-western point is OSNGR TL 45829 55102. The most easterly point is OSNGR TL 53005 49788.
Proposals	Phase 2 of the Cambridge South East Transport (CSET) project proposes a new off-road public transport route linking the Cambridge Biomedical Campus via Great Shelford, Stapleford and Sawston to a new travel hub near the A11/A1307/A505 junction with connections to Babraham, the Babraham Research Campus and Granta Park.
Scope of this Survey(s)	Provide an assessment of the hedgerows from the data collected from the desk study (archaeology and history); a field survey (wildlife and landscape); and the hedges assessed as to whether they qualify as 'Important' under the Regulations or not.
Results	<ul style="list-style-type: none"> • 6 hedgerows qualify as being important under the archaeology and history criteria. • 5 hedgerows qualify as being important under the wildlife and landscape criteria. • 8 hedgerows qualify as being important under the Hedgerow Regulations 1997, one of which is subject to confirmation of the hedge age.



Glossary

CEnv	Chartered Environmentalist
CIEEM	Chartered Institute of Ecology & Environmental Management
DEFRA	Department for the Environment, Food and Rural Affairs
Hedgerow Regulations	Hedgerow Regulations 1997
MCIEEM	Member of Chartered Institute of Ecology & Environmental Management

1.0 Introduction

1.1 Background

WYG was commissioned by Greater Cambridgeshire Partnership on 18th July 2019 to undertake a Hedgerow Regulations (1997) survey of 34 hedges mapped as species-rich during a preliminary ecological assessment (Plowman Craven, 2018), to determine which hedges are considered to be 'Important' under the Hedgerow Regulations to further inform the proposals.

This report has been prepared by WYG Principal Ecologist Tim Rich BSc, PhD, MCIEEM and the conditions pertinent to it are provided in Appendix A.

1.2 Site Location

The site comprises a linear route which extends from the Cambridge Biomedical Campus in Cambridge, through to the A11 beyond the village of Babraham. The site is centred at OSNGR TL 48499 51169. The most north-western point is OSNGR TL 45829 55102. The most easterly point is OSNGR TL 53005 49788.

1.3 Development Proposals

Phase 2 of the Cambridge South East Transport (CSET) project proposes a new off-road public transport route linking the Cambridge Biomedical Campus via Great Shelford, Stapleford and Sawston to a new travel hub near the A11/A1307/A505 with connections to Babraham, the Babraham Research Campus and Granta Park.

1.4 Purpose of the Report

The Hedgerow Regulations 1997 (Anon, 1997) made provision for protection of 'Important' Hedgerows in England and Wales. Important hedgerows are defined by the Regulation as those which have been in existence for 30 years or more, and which fulfil combinations of a range of archaeological, historical, landscape and wildlife criteria as set out in Part II of Schedule 1 of the Regulations (Anon, 1997; Appendix B).

In this report the data are collected from desk study (archaeology and history); a field survey (wildlife and landscape); and the hedges assessed as to whether they qualify as 'Important' under the Regulations or not.

Note that scientific names are provided at the first mention of each species and common names (where appropriate) are then used throughout the rest of the report for ease of reading.

A summary of the key legislation is also provided in Appendix B.



2.0 Methodology

There are many different hedge survey techniques (Rich *et al.* 2000; DEFRA 2007). The Hedgerow Regulations 1997 assessment requires a specific set of data to be collected (summarised in Appendix B), so a standard form was used to collect the relevant data (Appendix C).

Thirty-four species-rich hedges were identified for survey based on the Phase 1 habitat survey maps in Plowman Craven (2018) (see Figure 1). The Hedgerow Regulations 1997 were consulted to assess these hedges as follows:

Archaeology and history

Age of hedge (more than 30 years old or not) was assessed in the field from the estimated age of trees/shrubs in the field and checked from boundaries shown on 1945-1951 historic Ordnance Survey maps (the most recent available) on National Library of Scotland website (<https://maps.nls.uk/> accessed 30th October 2019). In practice the Ordnance Survey maps do not show if hedges were present or not, but if a boundary was shown on the map and it currently has a hedge it is assumed that the hedge has been present since that time. The Regulations assume the hedges to be more than 30 years old unless evidence is provided to the contrary.

Parish boundaries (Criterion 1) were taken from the 1:25,000 Ordnance Survey maps accessed through streetmap (<http://www.streetmap.co.uk/> accessed 30th October 2019).

Records for Scheduled Monuments (Criterion 2) were checked on MagicMap (<https://magic.defra.gov.uk/> accessed 31st October 2019).

For archaeological sites, pre-1600 manors and pre-inclosure field systems (Criteria 3-5) the hedges were checked against archaeological and historical data from the Cambridgeshire Historic Environment Record, the National Mapping Programme data and the Historic England National Record of the Historic Environment Record (NHRE) and photographs of historic maps held by the University of Cambridge (courtesy Phillippa Adams, Senior Archaeologist Mott MacDonald November 2019). There is no consistency in methods of mapping hedges on historical maps so they were interpreted in light of other boundary symbols used.

Wildlife and landscape

Rare species records (Criterion 6) were assessed from WYG 2019 survey data and from recent data held by the Cambridgeshire and Peterborough Environmental Records Centre (CPERC, data abstracted 22nd November 2019), comprising species listed under the Wildlife & Countryside Act 1981 Schedule 1 Part 1, Schedule 5 and Schedule 8, Red Data book species and Red & Amber List Bird species (the latter being more up to date than the 1990 Red Data Birds in Britain 'declining breeder (category 3)' specified in the original Hedgerow Regulations 1997) within a 10 m buffer from each hedge. To satisfy the criterion, the species record need to be contained within the hedgerow, rather than simply flying or moving past. In practice of the 53 records since 2009, there were very few records specifically associated with hedges, with many general records for 1 km squares including species such as fieldfare *Turdus pilaris*, hobby *Falco subbuteo*, kingfisher *Alcedo atthis*, marsh harrier *Circus aeruginosus*, red kite *Milvus milvus*, redwing *Turdus iliacus*, common pipistrelle *Pipistrellus pipistrellus*, noctule *Nyctalus noctula*, soprano pipistrelle *Pipistrellus pygmaeus* and western barbastelle *Barbastella barbastellus* all of which may use the hedges.

Field surveys (Criterion 7) were carried out to assess woody species richness and features on 18th / 19th September 2019 by Dr Tim Rich BSc, PhD, MCIEEM, an experienced botanist with 37 years' experience of ecological surveys. The weather was generally sunny and warm with some light cloud. Of the 34 hedges, no access was available to hedges 23 and 25-29 at this stage to avoid disturbance to shooting rights (see Figure 1).

As the whole of the hedge should be surveyed to assess the Regulations, lengths outside the immediate CSET study area were also surveyed to ensure compliance with the Regulations. Lengths of whole hedges were measured in GIS based on the field survey lengths. Hedges were surveyed from one side only, taking care to see as much on both sides of the hedge as possible.

The sections of each hedge surveyed for woody species depended on the overall length of the hedge, following the standard Hedgerow Regulations criteria (Table 1). Each 30 m length was measured using a tape measure and all woody species counted, only including the species listed in Schedule 3 of the Regulations (see Appendix B) thus common non-native hedgerow species such as sycamore *Acer pseudoplatanus* not listed on Schedule 3 were not counted.

Table 1. Sections surveyed for woody species in hedges of different lengths (Hedgerow Regulations Schedule 1, Section 7, Part 3).

Hedge length	Sections to survey for woody species
<30 m	Whole hedge
30-100 m	Central 30 m
100-200 m	Average number in central 30 m sections of each half
> 200 m	Average number in central 30 m sections of each third

Associated features were surveyed following the Regulations:

- Presence of a bank or wall supporting the hedgerow along at least one half was noted if present. Banks include half-banks where there is a step up in ground level. There is no definition of how large a bank needs to be to qualify under the Regulations; a minimum bank height of 15-20 cm was used here.
- Gaps were estimated as a percentage of the whole hedge. Where bramble *Rubus fruticosus* agg. patches occurred in gaps these were not included as bramble is not a woody species although brambles do provide some continuity.
- Standard trees were assessed as maiden trees with a diameter at breast height of 20 cm or more, or multi-stemmed trees with one stem with a diameter of 15 cm or more. Where few standards were present the number were counted to assess if on average the numbers of standard trees exceeded 1 every 50 m but where many standards were present clearly exceeding this threshold their presence was simply noted.
- Woodland species (i.e. ground flora rather than woody species) listed on Schedule 2 of the Regulations were searched for within 1 m of the hedge.
- Presence of a ditch along at least one half was noted if present. There is no definition of how deep a ditch needs to be to qualify under the Regulations; a minimum of 15-20 cm was used here.
- Connections were determined using 'end points' (nodes) as:
 - (1) any point of connection between two, or more, hedgerows or to other features;



- (2) the point at which a hedgerow stops and there is a gap of 20 m or more to the next hedgerow; and
- (3) the point at which the hedgerow links to woodland or other seminatural habitats (e.g. ponds) (DEFRA 2007).
- A connection with another hedgerow scored 1 point and a connection with a pond or a broad-leaved woodland scored 2 points, as set out in the Regulations.

Proximity to footpaths, bridleways and byways (Criterion 8) were taken from the 1:25,000 Ordnance Survey maps (accessed through streetmap, as above).

Comparison against the Hedgerow Regulations

The data were combined and tested against the criteria. Woody species richness was assessed against the standard criteria for southern hedges.

Under wildlife criterion 7, hedges were important if they met the following

- 7 woody species on average in a 30 m length;
- 6 woody species on average in a 30 m length and at least 3 associated features;
- 6 woody species on average in a 30 m length, including either a black poplar *Populus nigra* subspecies *betulifolia*, large-leaved lime *Tilia platyphyllos*, small-leaved lime *T. cordata* or wild service tree *Sorbus torminalis*; or,
- 5 woody species on average in a 30 m length and at least 4 associated features.

2.1 Limitations

The survey was carried out in September which meant that some of the spring-flowering 'woodland species' in the hedge ground flora such as wood anemone *Anemone nemorosa* would not have been visible, thus this feature could be under-assessed. However, as only 8 of 58 of the woodland species are spring-flowering and could have been overlooked, this limitation is unlikely to affect the results as the remainder are evergreen and would have been visible.

Additional hedgerows are present throughout the site which were not assessed during this survey. These hedgerows were not classified as being species-rich in the Ploughman Craven report (2018) and as such were not considered for this assessment. This is not considered to be a limitation to this survey as these hedgerows were not considered to be species-rich and therefore unlikely to meet the criteria as important hedgerows under the Regulations.

Access was not possible to hedgerows 23, 25, 26, 27, 28 and 29 at the time of the survey due to the land being used for game bird rearing and shooting. This is considered to be a limitation to the black route which bisects hedge 29. The five other hedgerows which could not be accessed are not shown to be bisected by any of the other road layout options (see Figure 2).



3.0 Survey Results

A summary of the status of the hedges is given in Table 2 and the more detailed data showing the criteria assessed for each hedge are given in Appendix D. The hedges are classified in Figure 1.

Table 2. Hedges surveyed and qualification of importance under the Hedgerow Regulations 1997. Note some hedges remain to be assessed when access is available.

Hedge no.	Grid reference	Length (m)	Estimated age	Qualifies as Important under Archaeology and history criteria	Qualifies as Important under Wildlife and landscape criteria	Qualifies as Important under Hedgerow Regulations 1997
1	TL4603354387	168	>30 years	No	No	No
2	TL4604554021	147	>30 years	No	No	No
3	TL4645453558	740	>30 years	No	No	No
4	TL4722753216	290	>30 years	No	No	No
5	TL4732653181	75	>30 years	No	No	No
6	TL4738453130	51	>30 years	No	No	No
7	TL4732053036	161	>30 years	Yes	No	Yes
8	TL4745053090	205	>30 years	No	No	No
9	TL4758753029	36	>30 years	No	No	No
10	TL4731552995	76	>30 years	No	No	No
11	TL4733352941	70	>30 years	No	No	No
12	TL4734652881	120	>30 years	No	No	No
13	TL4735952800	80	>30 years	No	Yes	Yes
14	TL4795052365	563	>30 years	No	No	No
15	TL4814052541	348	>30 years	No	No	No
16	TL4880851232	127	>30 years	Yes	No	Yes
17	TL4865951097	254	>30 years	No	No	No
18	TL4868550956	117	>30 years	No	No	No
19	TL4877450891	458	>30 years	No	No	No
20	TL4924650413	412	possibly >30 years	No	Yes	Yes subject to confirmation of hedge age
21	TL4954850301	783	>30 years	Yes	Yes	Yes
22	TL4941950007	207	>30 years	Yes	Yes	Yes
23	TL5019049752	217	>30 years	No	No access	Access required to assess
24	TL5072849569	94	>30 years	No	No	No



25	TL5084749264	2176	>30 years	No	No access	Access required to assess
26	TL5090449272	235	>30 years	No	No access	Access required to assess
27	TL5123249811	313	>30 years	No	No access	Access required to assess
28	TL5173649858	45	>30 years	No	No access	Access required to assess
29	TL5192349778	133	>30 years	No	No access	Access required to assess
30	TL5191148981	93	>30 years	Yes	No	Yes
31	TL5217649870	562	>30 years	No	No	No
32	TL5227549805	128	Probably recent	Adjacent to archaeological site (burial mounds)	No	No
33	TL5234449926	121	>30 years	No	No	No
34	TL5285249754	675	>30 years	Yes	Yes	Yes

The route options are shown in Figure 2, and Table 3 summarises which hedges are affected by each of the options; note that the green and pink route options join the black option at the south-east end, and the brown route joins the blue option.

Table 3. Hedges affected by route options.

Hedge no.	Important hedge	Black	Blue	Brown	Green	Pink
1	No	Yes	Yes	Yes	Yes	Yes
2	No	Yes	Yes	Yes	Yes	Yes
3	No	Yes	Yes	Yes	Yes	Yes
4	No					
5	No					
6	Yes					
7	No	Yes	Yes	Yes	Yes	Yes
8	No					
9	No					
10	No					
11	No					
12	Yes					
13	No					
14	No	Yes	Yes	Yes	Yes	Yes
15	Yes					
16	No					
17	No					
18	No					
19	Yes					
20	Yes					
21	Yes	Yes	Yes	Yes	Yes	Yes
22	To be assessed					
23	No					
24	To be assessed	Yes			Yes	Yes
25	To be assessed					
26	To be assessed					
27	To be assessed					
28	To be assessed					
29	Yes	Yes			(Yes)	(Yes)
30	No					
31	No	Yes	Yes	(Yes)	(Yes)	(Yes)
32	No	Yes	Yes	(Yes)	(Yes)	(Yes)
33	Yes					
34	Yes					



4.0 Discussion

Of the 34 hedges selected for survey, 28 were surveyed (see Figure 1). Access was not yet available to six hedges (see Figure 1 and Section 2.1). Hedges 10 and 11 were fences with scrub and garden trees which did not meet the definition of a hedge used by DEFRA (2007) as 'Any boundary line of trees or shrubs over 20 m long and less than 5 m wide between major woody stems at the base' but were surveyed and assessed anyway; furthermore garden hedges are specifically excluded from the Hedgerow Regulations 1997.

From the assessment carried out, hedges 7, 13, 16, 20, 21, 22, 30 and 34 would qualify as 'Important' under the Hedgerow Regulations. As such, prior to removal of these hedges permission must be gained from the Local Planning Authority by submitting a hedgerow removal notice (see Schedule 4 of the Hedgerows Regulations 1997) unless the removal would be permitted under other planning consents.

The number of hedges affected by the different route options are compared in Table 4. The blue and brown route options affect 8 hedges each, of which one is classified as important. The black, green and pink route options affect 10 hedges each, of which two are classified as important and one remains to be assessed.

Table 4. Number of hedges affected by route options

Route	Important hedges affected	Other hedges affected	Hedges remaining to be assessed	Total
Black	2	7	1	10
Blue	1	7	-	8
Brown	1	7	-	8
Green	2	7	1	10
Pink	2	7	1	10

5.0 Summary

The site comprises a linear route which extends from the Cambridge Biomedical Campus in Cambridge, through to the A11 beyond the village of Babraham which may affect hedges along the line of the route. A Hedgerow Regulations 1997 survey of 34 hedges mapped as species-rich during a Preliminary Ecological Assessment was carried out to determine which hedges are 'Important' under the Regulations.

Data were collated from desk study (archaeology and history criteria) and a field survey on 18th and 19th September 2019 (wildlife and landscape criteria). Of the 34 hedges selected for survey, 28 were surveyed and access was not yet available to six hedges.

From the assessment carried out, hedges 7, 13, 16, 20, 21, 22, 30 and 34 would qualify as 'Important' under the Hedgerow Regulations 1997. Prior to removal of these hedges permission must be gained from the Local Planning Authority by submitting a hedgerow removal notice unless the removal would be permitted under other planning consents approved by the Local Planning Authority.

The blue and brown route options affect 8 hedges each, of which one is classified as important. The black, green and pink route options affect 10 hedges each, of which two are classified as important and one remains to be assessed.

Prior to removal of any Important hedges, permission must be gained from the Local Planning Authority under a hedgerow removal notice unless removal is permitted under other approved planning consents.



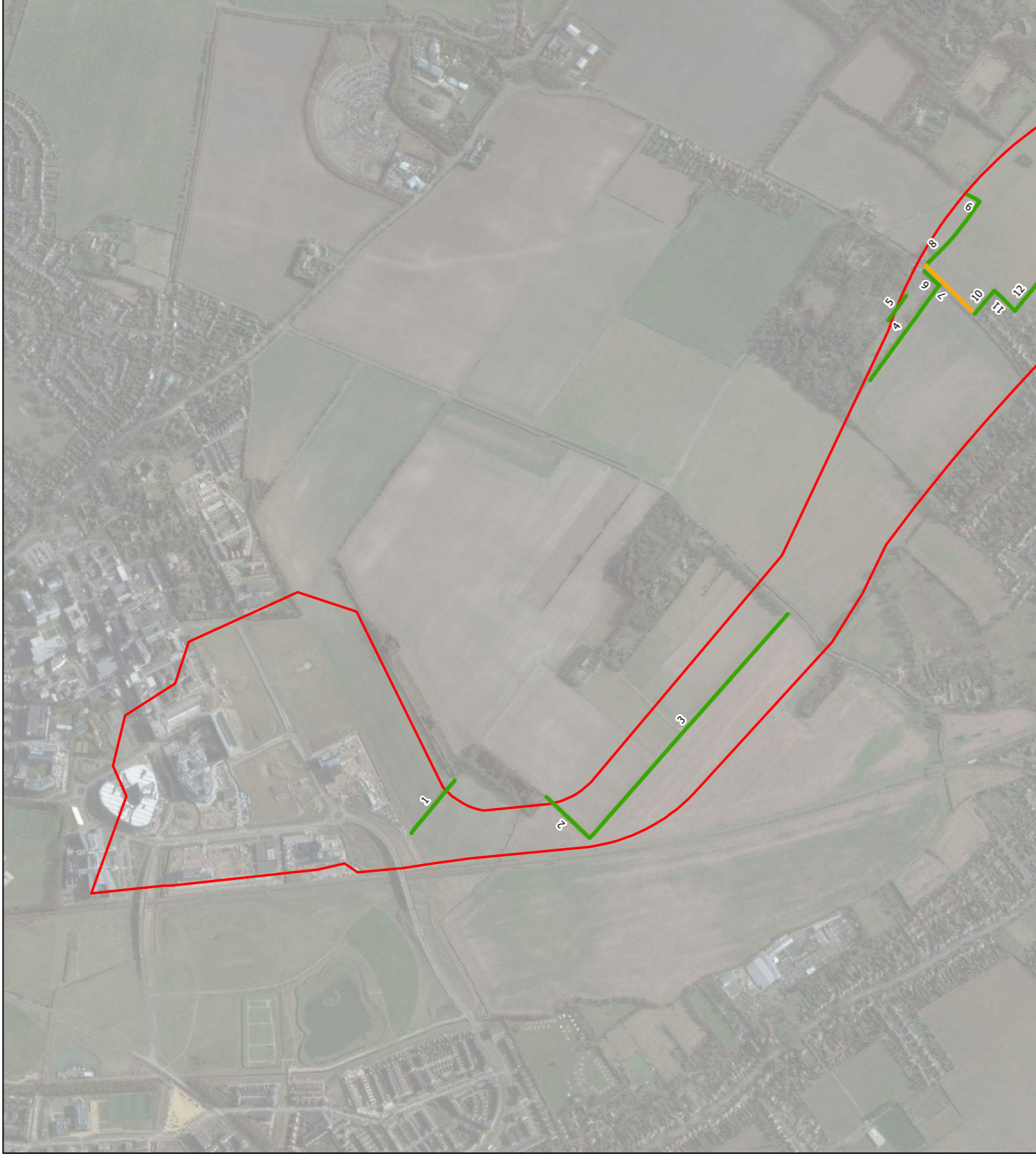
6.0 References

- Anon, (1997), Statutory Instruments 1997, No. 1160 Countryside, The Hedgerow Regulations 1997, London, HMSO. <http://www.legislation.gov.uk/uksi/1997/1160/contents/made>
- DEFRA, (2007), Hedgerow Survey Handbook. A standard procedure for local surveys in the UK, DEFRA, London.
- Plowman Craven (2018), Cambridge South East Transport Study Phase 2: Strategy 1, Preliminary Ecological Appraisal, November 2018, Unpublished Report to Greater Cambridge Partnership
- Rich, T. C. G., Clements, D. A., Lewis, J. & Moore, L. (2000), A comparison of four methods used to survey hedges: The Cardiff Hedgerow Survey 1998, *Journal of Environmental Management*, 60, 91-100.

Please note that the legislation which is relevant to this report is not included in the list above, but details are included in Appendix B below.

FIGURES

- Figure 1 – Hedges surveyed for the Hedgerow Regulations**
- Figure 2 – Route options**



Rev A	Date 11/03/20	Notes Initial map production
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Legend

- ▭ Survey area
- ▭ Important hedges
- ▭ Not important hedges

0 100 200 400 Metres

Hedges surveyed for Hedgerow Regulations

CSET
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Scale at A3: 1:9,000	Project No: A113521	Drawing No: Figure 1.A1	Revision: A
Drawn by: Ben Blowers		Approved by: Tim Rich	
Drawn date: 11/03/2020		Approved date: 11/03/2020	

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Rev A	Date 11/03/20	Notes Initial map production
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Legend

- ▭ Survey area
- ▭ Important hedges
- ▭ Not important hedges

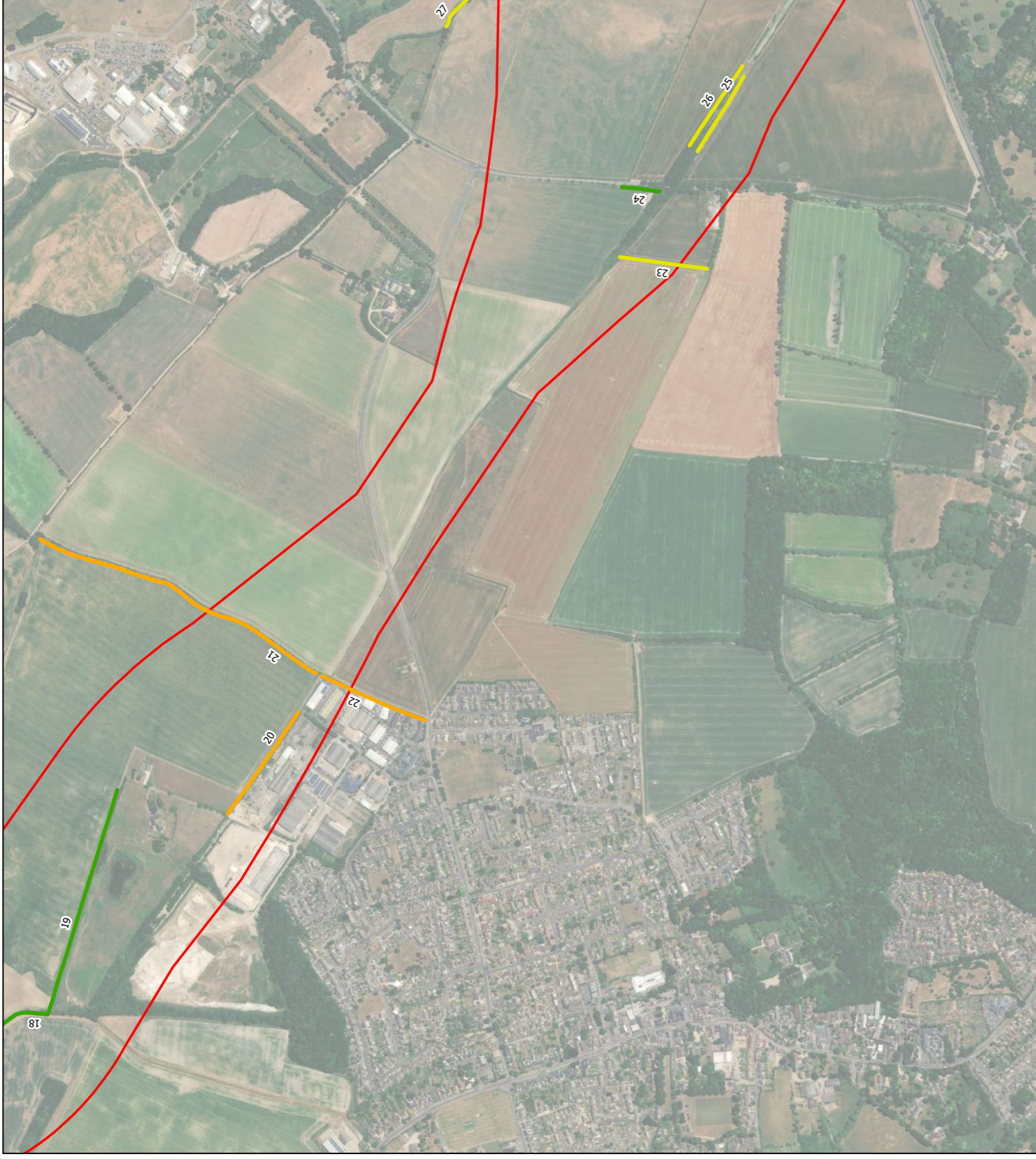
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Hedges surveyed for Hedgerow Regulations

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Drawn date: 11/03/2020		Approved date: 11/03/2020	

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Rev A	Date 11/03/20	Notes Initial map production
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Legend

- ▬ Survey area
- ▬ Important hedges
- ▬ Not important hedges
- ▬ Not surveyed (no access)

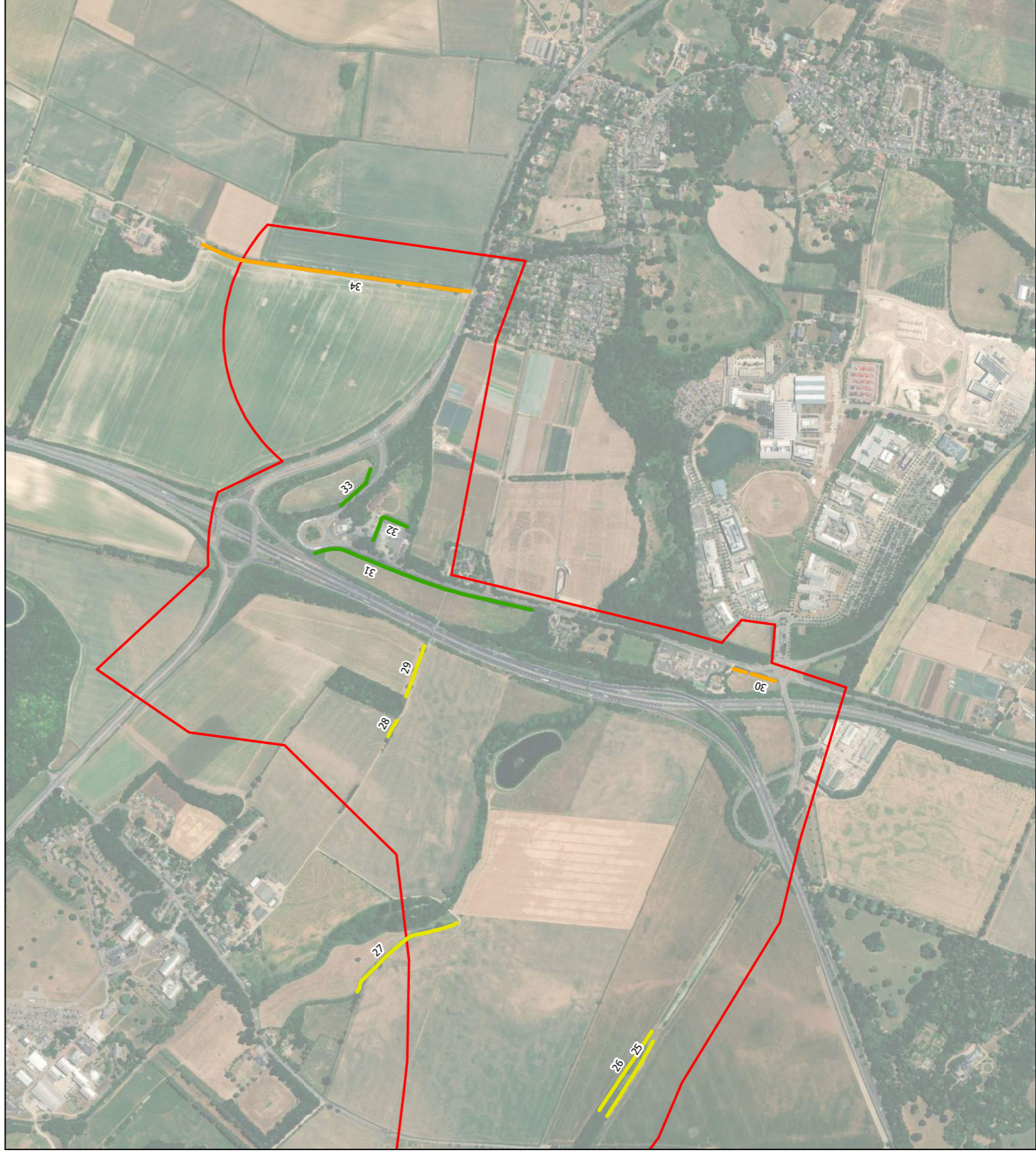
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Hedges surveyed for Hedgerow Regulations

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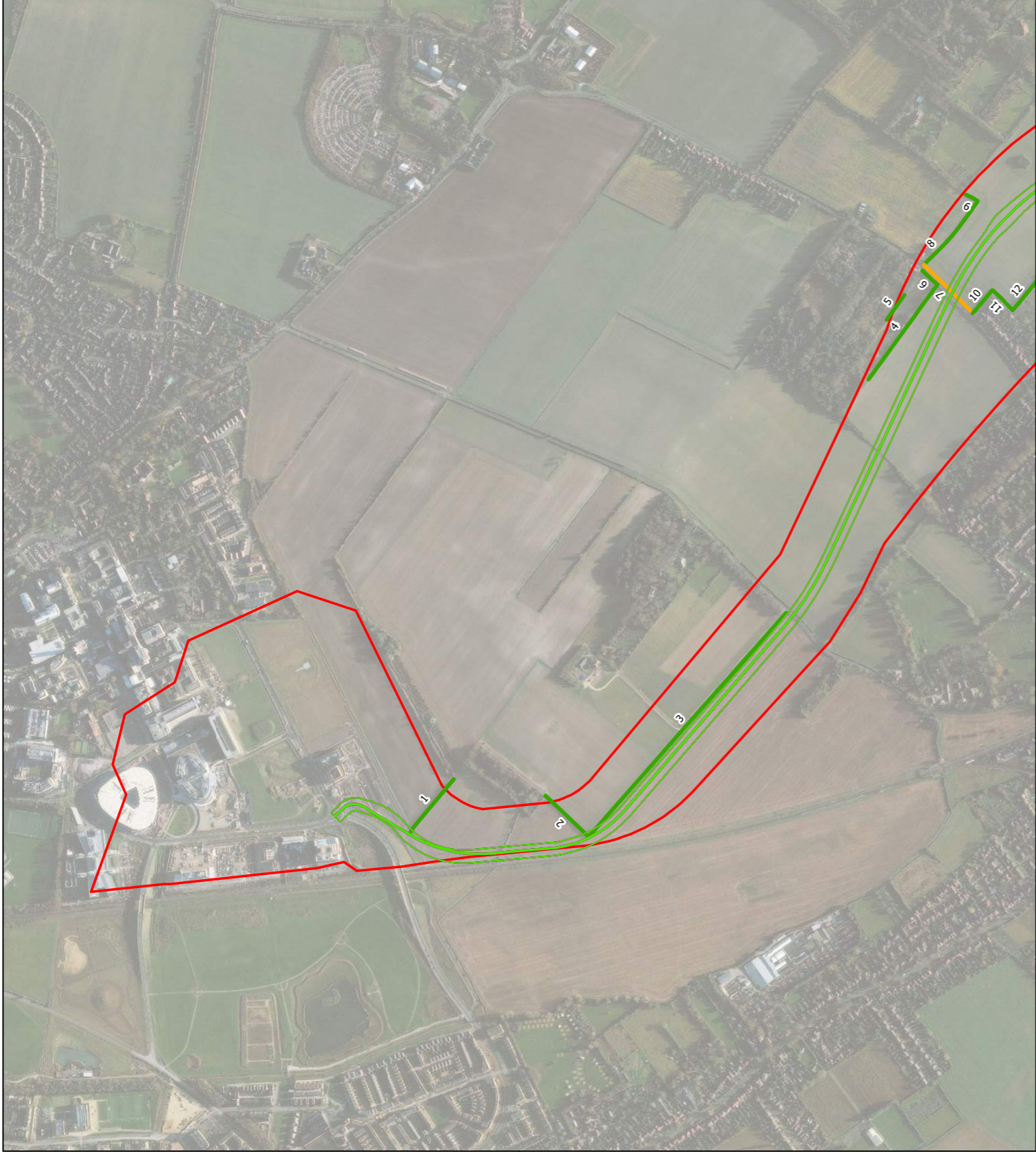
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Hedges surveyed for Hedgerow Regulations

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Rev	Date	Notes
A	11/03/20	Initial map production
B	07/04/20	Add text to legend

Legend

- ▬ Survey area
- ▬ Important hedges
- ▬ Not important hedges
- ▬ Phase 2 - pink option centre line
- ▬ Phase 2 - pink option boundary
- ▬ Phase 2 - green option centre line
- ▬ Phase 2 - green option boundary
- ▬ Phase 2 - brown option centre line
- ▬ Phase 2 - brown option boundary
- ▬ Phase 2 - blue option centre line
- ▬ Phase 2 - blue option boundary
- ▬ Phase 2 - black option centre line
- ▬ Phase 2 - black option boundary

Please note - all routes follow the Green route from the Cambridge Biomedical Campus CBC to Sawston after which they diverge.

0 100 200 400 Metres

Hedges surveyed for Hedgerow Regulations
CSET Route Option: All

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Scale at A3:	Project No:	Drawing No:	Revision:
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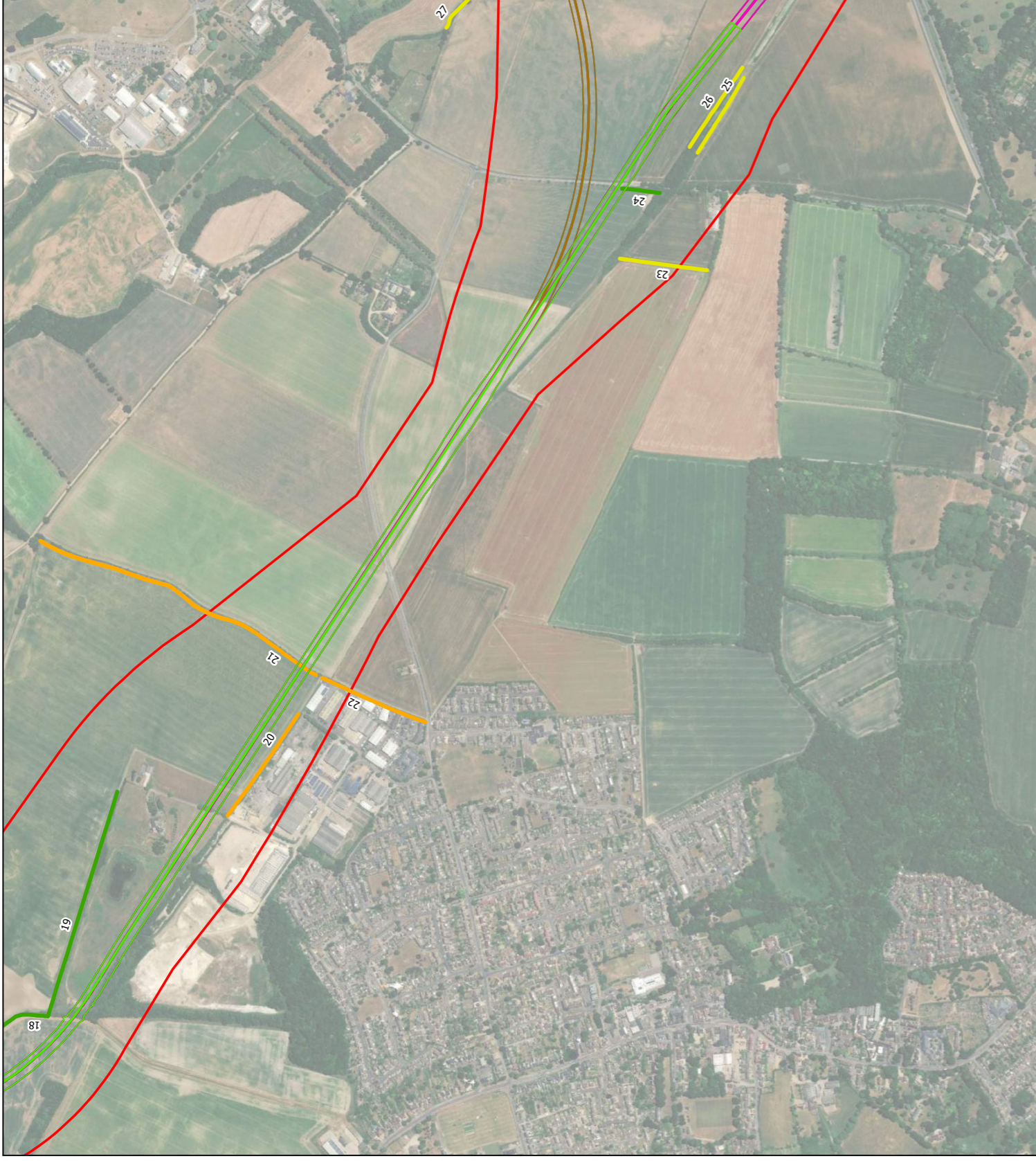
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Hedges surveyed for Hedgerow Regulations
CSET Route Option: All

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- Phase 2 - black option boundary

Phase note - all routes follow the green route from the Cambridge Biomedical Campus CBC to Sawston after which they diverge.

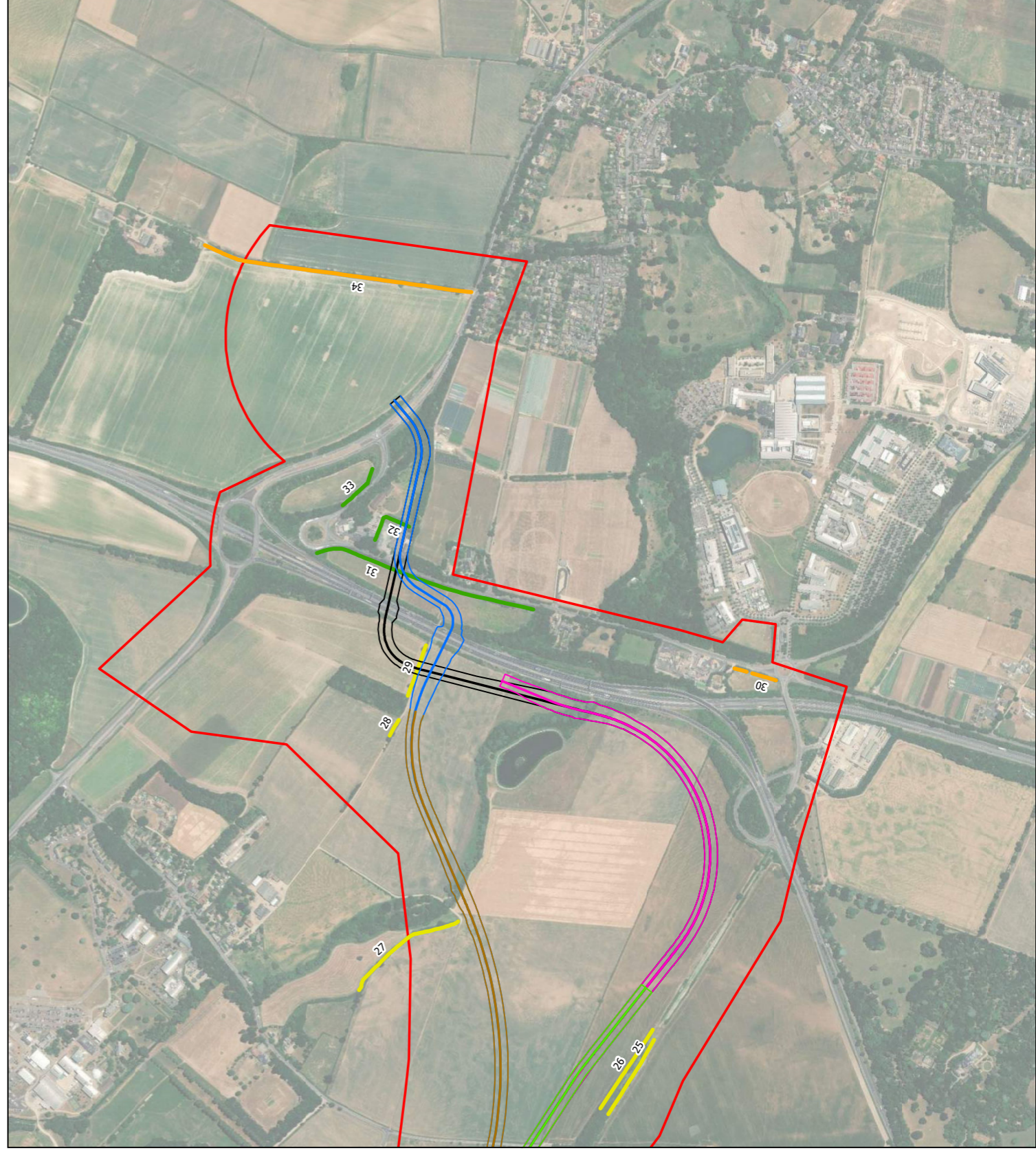
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Hedges surveyed for Hedgerow Regulations
CSET Route Option: All

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0 100 200 400 Metres

Hedges surveyed for Hedgerow Regulations
CSET Route Option: All

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Drawn by:	Drawn date:	Approved by:	
Ben Blowers	07/04/2020	Tim Rich	

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Appendix A – Report Conditions

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The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.



Appendix B – Summary of hedgerow Regulations 1997

A hedgerow is defined as any boundary line of trees or shrubs over 20 m long and less than 5 m wide at the base (DEFRA, 2007). A hedgerow is important (and is protected) if it is at least 30 years old and meets at least one of the criteria listed in Schedule 1 of Hedgerows Regulations (1997) as follows:

SCHEDULE 1 ADDITIONAL CRITERIA FOR DETERMINING “IMPORTANT” HEDGEROWS

Archaeology and History

1. The hedgerow marks the boundary, or part of the boundary, of at least one historic i.e. pre-1850 parish or township.
2. The hedgerow incorporates an archaeological feature which is;
 - included in the Schedule of Monuments compiled by the Secretary of State under section 1 (schedule of monuments) of the Ancient Monuments and Archaeological Areas Act 1979; or,
 - recorded at the relevant date in a Sites and Monuments Record.
3. The hedgerow is;
 - situated wholly or partly within an archaeological site or on land adjacent to and associated with such a site; and,
 - associated with any monument or feature on that site.
4. The hedgerow;
 - marks the boundary of a pre-1600 AD estate or manor recorded at the relevant date in a Sites and Monuments Record or in a document held at that date at a Record Office; or,
 - is visibly related to any building or other feature of such an estate or manor.
5. The hedgerow is;
 - recorded in a document held at the relevant date at a Record Office as an integral part of a field system pre-dating the Inclosure Acts; or,
 - part of, or visibly related to, any building or other feature associated with such a system, and that system is;
 - substantially complete; or,
 - of a pattern which is recorded in a document prepared before the relevant date by a local planning authority, within the meaning of the 1990 Act, for the purpose of development control within the authority’s area, as a key landscape characteristic.

Wildlife and Landscape

6. The hedgerow contains species of animal, bird or plant listed in the following documents;
 - Part 1 of Schedule 1 (birds receiving special protection), Schedule 5 (protected animals) or Schedule 8 (protected plants) of the Wildlife and Countryside Act 1981 (as amended);
 - Categorised as a declining breeder i.e. Category 3 of the Red Data Birds in Britain (Batten et al, 1990); or,
 - Categorised as endangered, extinct, rare or vulnerable in British Red Data Books (Shirt, 1987; Bratten et al., 1990; Bratton, 1991; Stewart & Church, 1992; Wigginton, 1999).



7. The hedgerow includes at least;

- 7 woody species (listed on Schedule 3 of the Hedgerows Regulations 1997 -see below) on average in a 30m length;
- 6 woody species on average in a 30m length and has at least 3 associated features*;
- 6 woody species on average in a 30m length, including either a black poplar *Populus nigra* ssp. *betulifolia*, large-leaved lime *Tilia platyphyllos*, small-leaved lime *Tilia cordata* or wild service tree *Sorbus torminalis*; or,
- 5 woody species on average in a 30m length and has at least 4 associated features.

Note: in some northern counties the number of woody species required is one less than the numbers stated above.

* associated features include;

- a bank or wall which supports the hedgerow along at least one half of its length;
- gaps which in aggregate do not exceed 10% of the length of the hedgerow;
- one standard tree, on average, every 50m section;
- at least 3 woodland species (listed on Schedule 2 of the Hedgerows Regulations 1997, see below) within one metre, in any direction, of the outermost edges of the hedgerow;
- a ditch along at least one half of the length of the hedgerow;
- connections with other hedgerows, woods or ponds scoring four points or more (where the connection has a point within 10m of the hedgerow and connections to other hedgerows score one point and connections to other broadleaved woodland or ponds scores two points). Note: these features do not count if a public right of way is being included in the criterion;
- a parallel hedge within 15m of the hedgerow.

8. The hedgerow;

- is adjacent to a bridleway or footpath, within the meaning of the Highways Act 1980, a road used as a public path, within the meaning of section 54 of the Wildlife and Countryside Act 1981 (as amended) or a byway open to all traffic, within the meaning of Part III of the Wildlife and Countryside Act 1981 (as amended); and,
- includes at least 4 woody species, on average, in a 30m length and has at least 2 associated features.

Schedule 2 – Woodland species

Barren strawberry *Potentilla sterilis*, Bluebell *Hyacinthoides non-scripta*, Broad buckler fern *Dryopteris dilatata*, Broad-leaved helleborine *Epipactis helleborine*, Bugle *Ajuga reptans*, Common cow-wheat *Melampyrum pratense*, Common dog violet *Viola riviniana*, Common polypody *Polypodium vulgare*, Dog's mercury *Mercurialis perennis*, Early dog violet *Viola reichenbachiana*, Early purple orchid *Orchis mascula*, Enchanter's nightshade *Circaea lutetiana*, Giant fescue *Festuca gigantea*, Goldilocks buttercup *Ranunculus auricomus*, Great bell-flower *Campanula latifolia*, Greater wood-rush *Luzula sylvatica*, Hairy brome *Bromus ramosus*, Hairy woodrush *Luzula pilosa*, Hard fern *Blechnum spicant*, Hard shield fern *Polystichum aculeatum*, Hart's tongue *Asplenium scolopendrium*, Heath bedstraw *Galium saxatile*, Herb paris *Paris quadrifolia*, Herb-Robert *Geranium robertianum*, Lady fern *Athyrium filix-femina*, Lords-and-ladies *Arum maculatum*, Male fern *Dryopteris filix-mas*, Moschatel *Adoxa moschatellina*, Narrow buckler-fern *Dryopteris carthusiana*, Nettle-leaved bell-flower *Campanula trachelium*, Oxlip *Primula elatior*, Pignut *Conopodium majus*, Primrose *Primula vulgaris*, Ramsons *Allium ursinum*, Sanicle *Sanicula europaea*, Scaly male-fern *Dryopteris affinis*, Small cow-wheat *Melampyrum sylvaticum*, Soft shield fern *Polystichum setiferum*, Sweet violet *Viola odorata*, Toothwort *Lathraea squamaria*, Tormentil *Potentilla erecta*, Wild strawberry *Fragaria vesca*, Wood anemone *Anemone nemorosa*, Wood avens/Herb bennet *Geum urbanum*, Wood false-brome

Brachypodium sylvaticum, Wood horsetail *Equisetum sylvaticum*, Wood meadow-grass *Poa nemoralis*, Wood melic *Melica uniflora*, Wood millet *Milium effusum*, Wood sage *Teucrium scorodonia*, Wood sedge *Carex sylvatica*, Wood sorrel *Oxalis acetosella*, Wood speedwell *Veronica montana*, Wood spurge *Euphorbia amygdaloides*, Woodruff *Galium odoratum*, Yellow archangel *Lamium galeobdolon*, Yellow pimpernel *Lysimachia nemorum*

Schedule 3 – Woody species

Alder *Alnus glutinosa*, Alder buckthorn *Frangula alnus*, Ash *Fraxinus excelsior*, Aspen *Populus tremula*, Beech *Fagus sylvatica*, Bird cherry *Prunus padus*, Black-poplar *Populus nigra* subspecies *betulifolia*, Blackthorn *Prunus spinosa*, Box *Buxus sempervirens*, Broom *Cytisus scoparius*, Buckthorn *Rhamnus cathartica*, Butcher's-broom *Ruscus aculeatus*, Crab apple *Malus sylvestris*, Dogwood *Cornus sanguinea*, Downy birch *Betula pubescens*, Downy currant *Ribes spicatum*, Dwarf gorse *Ulex minor*, Elder *Sambucus nigra*, Elm *Ulmus* species, Field maple *Acer campestre*, Gooseberry *Ribes uva-crispa*, Gorse *Ulex europaeus*, Grey poplar *Populus x canescens*, Guelder rose *Viburnum opulus*, Hawthorn *Crataegus monogyna*, Hazel *Corylus avellana*, Holly *Ilex aquifolium*, Hornbeam *Carpinus betulus*, Juniper *Juniperus communis*, Large-leaved lime *Tilia platyphyllos*, Mezereon *Daphne mezereum*, Midland hawthorn *Crataegus laevigata*, Mountain currant *Ribes alpinum*, Osier *Salix viminalis*, Pedunculate oak *Quercus robur*, Plymouth pear *Pyrus cordata*, Rose *Rosa* species, Rowan *Sorbus aucuparia*, Sea-buckthorn *Hippophae rhamnoides*, Sessile oak *Quercus petraea*, Silver birch *Betula pendula*, Small-leaved lime *Tilia cordata*, Spindle *Euonymus europaeus*, Spurge-laurel *Daphne laureola*, Walnut *Juglans regia*, Wayfaring-tree *Viburnum lantana*, Western gorse *Ulex gallii*, White poplar *Populus alba*, Whitebeam *Sorbus* species, Wild cherry *Prunus avium*, Wild cotoneaster *Cotoneaster cambricus*, Wild pear *Pyrus pyraster*, Wild privet *Ligustrum vulgare*, Wild service-tree *Sorbus torminalis*, Willow *Salix* species, Yew *Taxus baccata*.



Appendix C – Standard form used to collect Hedgerow Regulations data

Hedgerow Regulations survey form South version TRBC 2019

Hedge no.: GPS Date Aug 2019 Recorder: TCGRich

Site:

Hedge existed for 30 years or more? Yes/no

Satisfies at least one of the criteria below? Yes/no

1. Archaeology and history

Pre1850 parish bdy	Monuments Schedule	Archaeological site	pre1600 estate or manor bdy or related to building	pre-inclosure field system	Yes No Don't know yet

6. Record Centre records for rare species Schedule 1 birds (within 10 yrs), 5 animals (within 10 yrs), 8 plants (within 10 yrs), declining breeder, endangered/extinct/ rare/vulnerable in Vascular Plants RDB, "Insects (Shirt ed.) or Invertebrates other than insects (Bratton ed.) /Don't know/YES/NO

Woody species (0-30 m – count all; 30-100 m - central 30 m; 100-200 m, centre each half mean; 200+= m centre each 1/3 mean)

Acer campestre, Alnus glutinosa, Betula pendula, B. pubescens, Buxus, Carpinus, Cornus sanguinea, Corylus, Crataegus laevigata, C. monogyna, Cytisus, Daphne laureola, D. mezereum, Euonymus, Fagus, Frangula, Fraxinus, Hippophae, Ilex, Juglans, Juniperus, Ligustrum vulgare, Malus sylvestris, Populus alba, P. betulifolia, P. tremula, P. x canescens, Prunus avium, P. padus, P. spinosa, Pyrus pyraster, Quercus petraea, Q. robur, Rhamnus, Ribes uva-crispa, Rosa species, Ruscus, Salix species, Salix viminalis, Sambucus nigra, Sorbus aucuparia, S. species, S. torminalis, Taxus, Tilia cordata, T. platyphyllos, Ulex europaeus, U. gallii, U. minor, Ulmus species, Viburnum lantana, V. opulus No. woody sp:

Features

bank or wall $\geq 1/2$ length	Gaps $\leq 10\%$	Standards	Woodland species =
ditch $\geq 1/2$ length;	Connections scoring ≥ 4 pts (connect hedge=1pt, pond 2 pts, broadleaved wood 2 pts)	parallel hedge within 15 m	No. features=

Standards: For hedge < 50 m, ≥ 1 standard; hedge 50-100 m, ≥ 2 standards; 100 m+, average ≥ 1 standard (standard = multi-stemmed ≥ 2 stems dbh ≥ 15 cm, or maiden \geq dbh 20cm).

Woodland species ≥ 3 within 1 m of the outermost edges: *Adoxa, Ajuga reptans, Allium ursinum, Anemone nemorosa, Arum maculatum, Asplenium scolopendrium, Athyrium filix-femina, Blechnum spicant, Brachypodium sylvaticum, Bromopsis ramosus, Campanula latifolia, C. trachelium, Carex sylvatica, Circaea lutetiana, Conopodium majus, Dryopteris affinis, D. carthusiana, D. dilatata, D. filix-mas, Epipactis helleborine, Equisetum sylvaticum, Euphorbia amygdaloides, Festuca gigantea, Fragaria vesca, Galium odoratum, G. saxatile, Geranium robertianum, Geum urbanum, Hyacinthoides non-scripta, Lamiastrum galeobdolon, Lathraea squamaria, Luzula pilosa, L. sylvatica, Lysimachia nemorum, Melampyrum pratense, Melica uniflora, Mercurialis perennis, Milium effusum, Orchis mascula, Oxalis acetosella, Paris, Poa nemoralis, Polypodium vulgare s.l., Polystichum aculeatum, P. setiferum, Potentilla erecta, P. sterilis, Primula elatior, P. vulgaris, Ranunculus auricomus, Sanicula europaea, Teucrium scorodonia, Veronica montana, Viola odorata, V. reichenbachiana, V. riviniana* No. woodland species:

≥ 7 woody species	≥ 6 woody species and ≥ 3 features	≥ 6 woody species including Pop. Bet., Til. plat. or cord. or Sorb. torm.	≥ 5 woody species and ≥ 4 features

8. Hedgerow adjacent to a bridleway/footpath/byway and ≥ 4 woody species and ≥ 2 features Yes/no

Notes



Appendix D – Summary of hedgerow survey data

Hedge 1



Criterion	Survey results
More than 30 years old?	Yes
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	One water vole record associated with adjacent drain, but not hedge
7 Woody species and features	No
No. woody species (average)	5
No. features (sum of below)	2
• Bank or wall > 1/2 length	No
• Gaps < 10%	Yes (2% gaps)
• Standards	No (1 ash standard)
• Woodland species	No (0 woodland species)
• Ditch > 1/2 length	Yes (0.3 m shallow)
• Connections	No (2 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	
Qualifies as important?	No



Hedge 2



Hedge 3



Criterion	Survey results
More than 30 years old?	Yes
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	5
No. features (sum of below)	2
• Bank or wall > ½ length	Yes Low bank c. 0.3 m
• Gaps < 10%	Yes (0% gaps)
• Standards	No (0 standards)
• Woodland species	No (1 woodland species)
• Ditch > ½ length	No
• Connections	No (3 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	Bat activity associated with hedge during WYG 2019 surveys
Qualifies as important?	No

Criterion	Survey results
More than 30 years old?	Yes
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	2.5
No. features (sum of below)	2
• Bank or wall > ½ length	Change of ground level c. 0.5 m for over half length
• Gaps < 10%	Yes (2% gaps)
• Standards	No (0 standards)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (3 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	Bat activity associated with hedge during WYG 2019 surveys
Qualifies as important?	No



Hedge 4



Criterion	Survey results
More than 30 years old?	Not on 1945 map but has big trees
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	5
No. features (sum of below)	3
<ul style="list-style-type: none"> Bank or wall > ½ length 	No, small bank in places
<ul style="list-style-type: none"> Gaps < 10% 	Yes (0% gaps)
<ul style="list-style-type: none"> Standards 	No (5 standards)
<ul style="list-style-type: none"> Woodland species 	No (2 woodland species)
<ul style="list-style-type: none"> Ditch > ½ length 	No
<ul style="list-style-type: none"> Connections 	Yes (4 connections)
<ul style="list-style-type: none"> Parallel hedge 	No
8 Adjacent to bridleway etc	No
Notes	Many non-native species planted, including trees slightly off-set
Qualifies as important?	No

Hedge 5



Criterion	Survey results
More than 30 years old?	Yes, boundary on 1945 map
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	4
No. features (sum of below)	2
<ul style="list-style-type: none"> Bank or wall > ½ length 	No
<ul style="list-style-type: none"> Gaps < 10% 	Yes (5% gaps, one 3 m gap in middle)
<ul style="list-style-type: none"> Standards 	Yes (1 standard)
<ul style="list-style-type: none"> Woodland species 	No (1 woodland species)
<ul style="list-style-type: none"> Ditch > ½ length 	No
<ul style="list-style-type: none"> Connections 	No (3 connections, to wood and garden)
<ul style="list-style-type: none"> Parallel hedge 	No
8 Adjacent to bridleway etc	No
Notes	This is more scrub along a fence line, just about qualifies as hedge under DEFRA definition. Barberry <i>Berberis vulgaris</i> present.
Qualifies as important?	No



Hedge 6



Hedge 7



Criterion	Survey results
More than 30 years old?	Yes
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	4
No. features (sum of below)	4
• Bank or wall > ½ length	Yes (0.8 m half bank up to pavement/road)
• Gaps < 10%	Yes (0% gaps)
• Standards	No (3 standards)
• Woodland species	No (2 woodland species)
• Ditch > ½ length	No
• Connections	No (3 connections, 2 hedges and garden)
• Parallel hedge	Yes (opposite side of Hinton Way)
8 Adjacent to bridleway etc	No
Notes	Trees offset from line of hedge not included
Qualifies as important?	No

Criterion	Survey results
More than 30 years old?	Yes (boundary on 1945 map; indicated as hedge on Stapleford Inclosure 1812 map)
1 Parish boundary	Yes
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	5
No. features (sum of below)	1
• Bank or wall > ½ length	No
• Gaps < 10%	Yes (0% gaps)
• Standards	No (0 standards)
• Woodland species	No (1 woodland species)
• Ditch > ½ length	No
• Connections	No (2 connections)
• Parallel hedge	yes (opposite side of Hinton Way)
8 Adjacent to bridleway etc	No
Notes	Bat activity associated with hedge during WYG 2019 surveys
Qualifies as important?	Yes (parish boundary)



Hedge 8



Hedge 9



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1945 map; indicated as hedge on Stapleford Inclosure 1812 map)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	3.5
No. features (sum of below)	1
• Bank or wall > ½ length	No
• Gaps < 10%	Yes (5% gaps)
• Standards	No (1 standard on garden edge)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (2 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	NW end adjacent to garden
Qualifies as important?	No

Criterion	Survey results
More than 30 years old?	Yes (boundary on 1945 map; indicated as hedge on Stapleford Inclosure 1812 map)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	4
No. features (sum of below)	0
• Bank or wall > ½ length	No
• Gaps < 10%	No (25% gaps, 8 m missing section)
• Standards	No (0 standards)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (3 connections, hedge and plantation)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	
Qualifies as important?	No



Hedge 10



Criterion	Survey results
More than 30 years old?	Yes (houses shown on 1945 map but not boundary)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	2
No. features (sum of below)	0
• Bank or wall > ½ length	No
• Gaps < 10%	No (some sections are fences with bramble and ivy)
• Standards	No (3 standards but in adjacent garden rather than hedge)
• Woodland species	No (1 woodland species)
• Ditch > ½ length	No
• Connections	No (2 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	This is a fence with some woody vegetation but much bramble and ivy and shrubs/trees inside garden; not a hedge! Hedgerow Regulations do not apply to garden hedges. Bat activity associated with 'hedge' during WYG 2019 surveys
Qualifies as important?	No

Hedge 11



Criterion	Survey results
More than 30 years old?	Yes (houses shown on 1945 map but not boundary)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	0
No. features (sum of below)	1
• Bank or wall > ½ length	No
• Gaps < 10%	Yes (50% fence)
• Standards	No (0 standards)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (2 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	Not a hedge, mainly bramble and traveller's joy scrub along garden fence, with plum and walnut! Hedgerow Regulations do not apply to garden hedges.
Qualifies as important?	No



Hedge 12



Criterion	Survey results
More than 30 years old?	Probably, not shown on 1945 OS map, adjacent to orchard, trees could be > 30 years
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	3
No. features (sum of below)	2
• Bank or wall > ½ length	No (low bank present in places to 20 cm)
• Gaps < 10%	Yes (about 10% gap with brambles only)
• Standards	Yes (ash standards)
• Woodland species	No (1 woodland species)
• Ditch > ½ length	No
• Connections	No (2, connection to hedge and garden)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	NE boundary of orchard, may never have been a true hedge but fits general definition now
Qualifies as important?	No

Hedge 13



Criterion	Survey results
More than 30 years old?	Probably, not shown on 1945 OS map, adjacent to orchard, trees could be > 30 years
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	Yes
No. woody species (average)	6
No. features (sum of below)	4
• Bank or wall > ½ length	Yes (c. 0.5 m at NE end)
• Gaps < 10%	Yes (small gap at SW end)
• Standards	Yes (6 walnuts)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	Yes
• Connections	No (3 connections, excluding orchard)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	SE boundary of orchard. Hedge unlikely to predate Pill Box in orchard (Pill Box listed in Cambridgeshire Historic Environment Record no MCB16391)
Qualifies as important?	Yes



Hedge 14



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 OS map)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	2.66
No. features (sum of below)	3
• Bank or wall > ½ length	Yes (0.5 m half bank down to field)
• Gaps < 10%	Yes (0% gaps)
• Standards	No (6 ash standards, clustered, average < 1 per 50m)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (3 connections; 2 hedges 1 garden)
• Parallel hedge	Yes (opposite side of road, at least in part)
8 Adjacent to bridleway etc	No
Notes	NW side of Stapleford Road. Planted <i>Sorbus austriaca</i> present. Bat activity associated with hedge during WYG 2019 surveys
Qualifies as important?	No

Hedge 15



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 map)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	3.33
No. features (sum of below)	4
• Bank or wall > ½ length	Yes (0.5 m down to field)
• Gaps < 10%	Yes (2% gaps)
• Standards	Yes (11 standard)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (0 connections)
• Parallel hedge	Yes (opposite side of road, at least in part)
8 Adjacent to bridleway etc	No
Notes	SE side of Stapleford Road. Contains one standard of <i>Tilia cordata</i> (presumably planted). Also present planted <i>Sorbus austriaca</i> . Bat activity associated with hedge during WYG 2019 surveys
Qualifies as important?	No



Hedge 16



Hedge 17



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 map)
1 Parish boundary	Yes
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	4
No. features (sum of below)	2
• Bank or wall > ½ length	No
• Gaps < 10%	Yes (0% gaps)
• Standards	No (0 standard)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	Yes – quite deep
• Connections	No (3 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	Bat activity associated with hedge during WYG 2019 surveys
Qualifies as important?	Yes

Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 map)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	3
No. features (sum of below)	1
• Bank or wall > ½ length	yes (c. 0.5m high half bank up)
• Gaps < 10%	No (15% gaps, very scrappy and open)
• Standards	No (0 standard)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (2 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	
Qualifies as important?	No



Hedge 18



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 map)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	5
No. features (sum of below)	3
• Bank or wall > ½ length	No
• Gaps < 10%	Yes (5% gaps, large gap in middle)
• Standards	Yes (4 standard)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	Yes (quite deep along length)
• Connections	No (3 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	
Qualifies as important?	No

Hedge 19



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 map)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	3
No. features (sum of below)	2
• Bank or wall > ½ length	No
• Gaps < 10%	Yes (2% gaps)
• Standards	No (big balsam poplars present but scarcely part of hedge)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	Yes (no ditch by beech hedge at SE end)
• Connections	No (2 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	More scrub along a ditch line than a proper hedge, but qualifies under DEFRA definition; SE end has balsam poplars and differs in structure to rest of hedge
Qualifies as important?	No



Hedge 20



Criterion	Survey results
More than 30 years old?	Uncertain; looks to be a relatively new hedge planted with many different species along metal palisade fence of industrial estate, tree guards present. Hedge on line of old railway line boundary on 1951 map.
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	Yes
No. woody species (average)	6.33
No. features (sum of below)	3
• Bank or wall > ½ length	Yes (half bank c. 0.5 m up from field)
• Gaps < 10%	Yes (0% gaps)
• Standards	Yes (many at SE end)
• Woodland species	No (1 woodland species)
• Ditch > ½ length	No
• Connections	No (2 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	SE end excluded where it is a fence with old man's beard. Railway listed in Cambridgeshire Historic Environment Record (MCB7680)
Qualifies as important?	Yes subject to age

Hedge 21



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 OS map. Indicated as hedge on 1829 Babraham map).
1 Parish boundary	Yes
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	4
No. features (sum of below)	3
• Bank or wall > ½ length	Yes (very low bank c. 0.3 m along much of length)
• Gaps < 10%	Yes (5% gaps)
• Standards	No (many standards)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (3 connections; hedge SW end, woodland NE end)
• Parallel hedge	No
8 Adjacent to bridleway etc	Yes
Notes	Bat activity associated with hedge during WYG 2019 surveys
Qualifies as important?	Yes



Hedge 22



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 map. Indicated as hedge on 1829 Babraham map).
1 Parish boundary	Yes
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	2 hedgehog records killed on adjacent road but not hedge
7 Woody species and features	Yes
No. woody species (average)	7.5
No. features (sum of below)	1
• Bank or wall > ½ length	No
• Gaps < 10%	Yes (0% gaps)
• Standards	No (0 standard)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (1 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	Yes
Notes	At SW end it is a belt of trees along a chain link fence adjacent to industrial estate, may have been derived from former hedge; overall qualifies under DEFRA hedge definition
Qualifies as important?	Yes

Hedgerow 23 – no access.

Hedge 24



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 map. Indicated as hedge on 1829 Babraham map).
1 Parish boundary	No (boundary runs on east side of road)
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	5
No. features (sum of below)	3
• Bank or wall > ½ length	Yes (0.7 m high bank up from road)
• Gaps < 10%	No (30% gaps)
• Standards	Yes (12 standard)
• Woodland species	No (1 woodland species)
• Ditch > ½ length	No
• Connections	No (1 connection to old railway line hedge)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	Scrappy hedge with large standards and lots of gaps
Qualifies as important?	No

Hedgerow 25-29 – no access



Hedge 30



Criterion	Survey results
More than 30 years old?	Probably, approximate boundary on 1951 map but this is now a line of planted sycamore from realigned road bank and younger than OS map; however, trees look big enough
1 Parish boundary	Yes
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	6
No. features (sum of below)	2
• Bank or wall > ½ length	Yes (c. 1.5 m up from field)
• Gaps < 10%	Yes (20% gaps mainly SE end, gate in middle)
• Standards	No (many sycamore standards)
• Woodland species	No (1 woodland species)
• Ditch > ½ length	No
• Connections	No (1 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	More a line of planted trees along realigned road, may never have been a proper hedge on this exact line but meets DEFRA definition Uncommon plant Lesser calamint <i>Clinopodium nepeta</i> present on verge but not in hedge
Qualifies as important?	Yes

Hedge 31



Criterion	Survey results
More than 30 years old?	Probably, approximate boundary on 1951 map but this is now a line of planted trees and may be younger than OS map; however, trees certainly big enough to be > 30 years. 1803 Little Abingdon Inclosure maps indicates hedge. 1829 Babraham indicates this to be a band of trees.
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	LRC data include hedgehog killed on adjacent road, very likely to be using the hedge
7 Woody species and features	No
No. woody species (average)	5.4
No. features (sum of below)	2
• Bank or wall > ½ length	No (gentle slope only)
• Gaps < 10%	Yes (0% gaps)
• Standards	Yes (numerous standards)
• Woodland species	No (2 woodland species)
• Ditch > ½ length	No
• Connections	No (2 connections, wooded garden and scrub)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	More a line of planted trees along realigned road, may never have been a proper hedge on this exact line but meets DEFRA definition of a hedge
Qualifies as important?	No



Hedge 32



Criterion	Survey results
More than 30 years old?	No – not on 1951 map, small trees and tree guards present, presumably put in when Travelodge built
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	Hedge adjacent to cluster of three burial mounds in grounds of hotel -barrows and ditches (listed in Cambridgeshire Historic Environment Record MCB14499, MCB 14498, MCB 14497, MCB11167)
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	3
No. features (sum of below)	2
• Bank or wall > ½ length	No
• Gaps < 10%	Yes (0% gaps)
• Standards	Yes (many standards meeting size criteria)
• Woodland species	No (0 woodland species)
• Ditch > ½ length	No
• Connections	No (2 connections, garden and hedge)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	Looks to be a relatively recent (<30 years) hedge. Hedge adjacent to archaeological features but hedge not directly associated with them
Qualifies as important?	No

Hedge 33



Criterion	Survey results
More than 30 years old?	Probably from size of trees though not on 1951 map
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	No
6 LRC data rare species	No
7 Woody species and features	No
No. woody species (average)	5
No. features (sum of below)	2
• Bank or wall > ½ length	No (some small low parts)
• Gaps < 10%	Yes (0% gaps though gate in middle)
• Standards	Yes (many standards)
• Woodland species	No (1 woodland species)
• Ditch > ½ length	No
• Connections	No (3 connections, hedge and plantation)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	More a line of planted trees along realigned road, may never have been a proper hedge on this exact line but meets DEFRA definition of a hedge
Qualifies as important?	No



Hedge 34



Criterion	Survey results
More than 30 years old?	Yes (boundary on 1951 map, large beech present)
1 Parish boundary	No
2 Monuments schedule	No
3 Archaeological Site	No
4 pre1600 manor	No
5 pre-inclosure field system	Yes; boundary shown on Little Abingdon Inclosure 1803/ Little Abingdon Inclosure Award 1807 maps as belonging to Edmond Fisher so hedge assumed to be present
6 LRC data rare species	No
7 Woody species and features	Yes
No. woody species (average)	6.66
No. features (sum of below)	3
• Bank or wall > ½ length	Yes (banks up to 0.3 m)
• Gaps < 10%	Yes (1% gaps)
• Standards	Yes (15 standards)
• Woodland species	No (1 woodland species)
• Ditch > ½ length	Yes
• Connections	No (3 connections)
• Parallel hedge	No
8 Adjacent to bridleway etc	No
Notes	Bat activity associated with hedge during WYG 2019 surveys
Qualifies as important?	Yes

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