

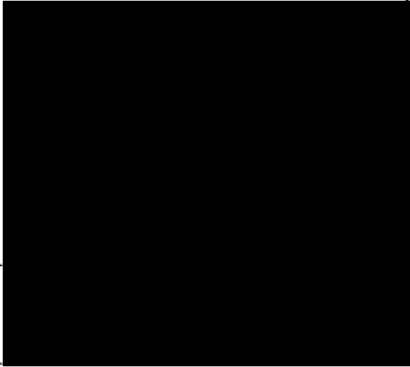
Preliminary Ecological Appraisal

for

South West Cambridge: Land North of Barton
Road

January 2020

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Report author:		Name: Nick Aldus Title: Senior Ecologist
		Name: Chris Wood Title: Environmental Assistant
Approved by:		Name: Dr Jo Parmenter Title: Director
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Client Details	
Client:	Carter Jonas
Client Address:	One Station Square Cambridge CB1 2GA

Contact Details
The Landscape Partnership Ltd Greenwood House 15a St Cuthberts Street Bedford MK40 3JG Tel: 01234 261315 East Building Holland Court Cathedral Close Norwich NR1 4DY Tel: 01603 230777 The Granary Sun Wharf Deben Road Woodbridge IP12 1AZ Tel: 01394 380509 Ensign House (E&F) Tavern Quay Sweden Gate Surrey Quays London SE16 7TX Tel: 020 3092 4141 The Landscape Partnership Ltd is a practice of Chartered Landscape Architects, Chartered Ecologists and Chartered Environmentalists, registered with the Landscape Institute and a member of the Institute of Environmental Management & Assessment & the Arboricultural Association. Registered Office: Greenwood House 15a St Cuthberts Street Bedford MK40 3JG Registered in England No 2709001

Quality standards
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Non-technical summary

The Landscape Partnership was commissioned by Carter Jonas, on behalf of the North Barton Road Landowners Group, to undertake a Preliminary Ecological Appraisal comprising a desk study, Phase 1 Habitat Survey and a botanical survey of on-site County Wildlife Sites together with an assessment of potential impacts on land at South West Cambridge: Land North of Barton Road.

The objectives of the appraisal were to identify the habitats and species present or potentially present and evaluate their importance, assess the impact of the development proposal and describe any measures necessary to avoid impacts, reduce impacts or compensate for impacts so that there is no net harm to ecological features.

The survey involved classifying and recording habitat types and features of ecological interest and identified the potential for protected species to be present by assessing habitat suitability for those species. The survey was undertaken by appropriately qualified and experienced personnel.

The site comprises predominantly arable fields with associated hedgerows, scrub, grassed headlands, woodland plantation and buildings. Three County Wildlife Sites are present on, and immediately adjacent to the site. Habitats associated with the County Wildlife Sites are assessed as being of value at the **County** scale. All other habitats on site are provisionally assessed as being of value at up to the **Parish** scale.

Based on the habitat types present, it is considered that the site has potential to support the following protected species or groups of species: important hedgerows, rare plants, great crested newt, reptiles, breeding birds, water vole, otter, badger and foraging and roosting bats.

No development is currently proposed, however this report is produced in support of a site promotion through the Greater Cambridge Local Plan process, to seek the removal of the land from the Green Belt to facilitate development of an urban extension and the ecological survey work has also been used in the development of an illustrative masterplan.

In the absence of mitigation, the proposed development could give rise to **Major Adverse impacts** upon County Wildlife Sites, and **Moderate to Major Adverse** impacts upon habitats. **Unknown** impacts remain for protected species subject to further recommended detailed surveys.

Outline mitigation for known or likely impacts to habitats has been proposed, including measures for land adjacent to County Wildlife Site hedgerows to ensure that flowering plant interest features can continue to germinate both during and after any future development.

Further survey is recommended in respect of hedgerows, rare plants, great crested newt, reptiles, breeding birds, badger, water vole, otter, bat activity and roosting, in order to understand the impact of the proposals upon these groups and to inform effective mitigation design.

Subject to the development of comprehensive site layout plans, further surveys and the inclusion of recommended mitigation, impacts in the range **Minor Adverse to Minor Beneficial** are considered likely.

1 Introduction

1.1 Commission

- 1.1.1 The Landscape Partnership was commissioned by Carter Jonas, on behalf of the North Barton Road Landowners Group (consisting of Cambridge University bodies), to carry out a Preliminary Ecological Appraisal (PEA), comprising a desk study, Phase 1 Habitat Survey and a botanical survey of on-site County Wildlife Sites together with an assessment of potential impacts.

1.2 Legislation and policy background

- 1.2.1 There is a range of protection given to sites and species. Sites may be designated for local, national, European or global importance for nature conservation. Species may be protected by European-scale legislation or varying levels of national regulation.
- 1.2.2 The Local Planning Authority has a policy to protect features of nature conservation value within its Local Plan. Other regulators have policies relating to the consents issued by them.
- 1.2.3 Further information is given in Appendix 1.

1.3 Reporting standards

- 1.3.1 This report was written in compliance with British Standard 42020:2013 'Biodiversity — Code of practice for planning and development' and the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct.
- 1.3.2 This report was prepared in accordance with the CIEEM 'Guidelines for Ecological Report Writing' as updated December 2017¹.
- 1.3.3 The report was prepared by Dr Jo Parmenter, Nick Aldus and Chris Wood. The report was reviewed by Dr Jo Parmenter, Director of The Landscape Partnership.
- 1.3.4 Assessment was undertaken against current legislation and planning policy, and in accordance with standard guidance. Further information is given in Section 2 and Appendix 2.

1.4 Site location and context

- 1.4.1 The site is an area of approximately 156 ha to the west of Cambridge, between Barton Road (A603), the M11 and University development south of Maddingley Road (A1303). It forms a roughly triangular shaped area of land defined by the M11 to the west and Barton Road to the southeast. Residential and College campus buildings lie to the northeast and north. The site is shown in Figure 01.
- 1.4.2 The land is used primarily for arable farming and sits within Cambridge's Green Belt. Designated features of note for ecology with or adjacent to the site include one County and one City Wildlife Site.

1.5 Acknowledgements

Surveyor Competencies

Survey(s) undertaken	Surveyor(s)	Experience (years)	Licences Held
Phase 1 habitat survey	Nick Aldus MCIEEM	15+	Great crested newt Class Licence CL08 (Level 1) Bat Class Licence CL18 (Level 2)

Other contributors

- 1.5.1 We acknowledge the input of the Cambridgeshire and Peterborough Environmental Records Centre for the supply of biological records data.

¹ CIEEM (2017) Guidelines on Ecological Report Writing. Chartered Institute of Ecology and Environmental Management, Winchester

1.6 Description of the project

- 1.6.1 This report is produced in support of a site promotion through the Greater Cambridge Local Plan process, to seek the removal of the land from the Green Belt to facilitate development of an urban extension. An illustrative masterplan has been prepared and forms an appendix to this report (Appendix 6)

1.7 Objectives of this appraisal

- 1.7.1 The purpose of this appraisal is to inform the site promotion, and the development of an illustrative masterplan. Detailed objectives are to:
- identify the habitats and species present or potentially present and evaluate their importance;
 - identify any ecological constraints to development;
 - assess the impact of the development proposal;
 - identify any opportunities available for integrating ecological features within the development;
 - describe any measures necessary to avoid impacts, reduce impacts or compensate for impacts so that there is no net harm to ecological features;
 - propose ecological enhancements;
 - identify any additional surveys that may be required to inform an Ecological Impact Assessment (EcIA).

1.8 Previous ecological studies

- 1.8.1 Ecological studies were carried out on parts of the site in 2012. CSa Environmental Planning carried out an Ecological Appraisal covering the southern part (along with land south of Barton Road)² and there was ecological input into The Landscape Partnership's Landscape Appraisal and Greenbelt Review for the northern, Grange Farm part of the site. The CSa study was critiqued by a further report by James Cadbury on behalf of Save the West Fields in 2015.³ All previous studies have been taken account in the preparation of this current preliminary appraisal.
- 1.8.2 The CSa report identified broad habitat presence and acknowledged the Bin Brook (then) County Wildlife Site (CWS) and the Hedgerows East of M11 CWS, along with the presence of mature trees and protected fauna, of which it recommended further surveys. The habitats were generally assessed of being "of value at least at the Local/Parish level".
- 1.8.3 James Cadbury's subsequent report also considered ecological and landscape linkages beyond the site boundary, including the "Coton green corridor", comprising the Bin Brook and flood meadows to its east, and the farmland mosaic south of the Coton Footpath (surrounding the Hedgerows East of M11 CWS) in its wider context. The report emphasised the value of the habitats in the area being assessed as being collectively of value at the level of the city region, largely because of their contiguity and connection to wider ecological resources.

1.9 Duration of appraisal validity

- 1.9.1 The assessment, conclusions and recommendations in this appraisal are based on the studies undertaken, as set out in this report, and the stated limitations. This appraisal is based on the project as described and any changes to the project would need the appraisal to be reviewed. Unless otherwise stated, the assessment, conclusions and recommendations given assume that the site habitats will continue to be used for their current purpose without significant changes until development takes place. However, changes in use or management may occur between the time of the survey and proposals being implemented. Ecological features may change naturally at any time; for example, species may be lost from existing sites or colonise new areas. Our knowledge of the ecology of the site enables us to provide an estimate of the duration of the validity of the surveys carried out and hence the applicability of this appraisal, so that any future

² CSa Environmental Planning (2012) *Land North & South of Barton Road, Cambridge: Ecological Appraisal*, CSa/2025/02, on behalf of Januarys (Cambridge) Ltd.

³ Save the West Fields (2015) *Initial Ecological Appraisal*.

need for review and update of this appraisal, or the surveys described within it, and the date by which such updates would become necessary, can be identified.

1.9.2

The table below sets out a guide to duration of validity of each element of each information source. If the proposed development is delayed beyond the stated timescale, update surveys or further investigations may be required. Provided a planning application is made and validated prior to the end of the period stated below there would not normally be a requirement for further update survey except as indicated in Section 4.6.

Information source	Date undertaken	Guideline duration of validity from date undertaken	Notes
Desk study	28 th August 2019	1 – 2 years	Further data may become available.
Phase 1 habitat survey	25 th September 2019	2 years	The habitats on site may change especially if management changes.

2 Methodology

2.1 Desk study methodology

- 2.1.1 Cambridgeshire and Peterborough Environmental Records Centre was asked to provide records of protected, rare and/or priority species and details of statutory and non-statutory designated sites, within a 2km radius of the site boundary. The data were received on 28th August 2019.
- 2.1.2 The Magic website⁴ was used to identify European sites within a 10km radius and national sites within a 5km radius. The Magic website was accessed on 28th August 2019.
- 2.1.3 Aerial photographs and OS maps were used to gain initial information about the site and the surrounding area. This gives an indication of the types of habitat and species likely to be present and the setting of the site within the landscape.
- 2.1.4 Water bodies within 500m of the site were identified from the relevant 1:25,000 Ordnance Survey map sheet, to establish the need for protected species scoping surveys, such as great crested newt Habitat Suitability Index surveys. Consideration was also given to the green infrastructure of the local area.
- 2.1.5 The potential for protected, rare and/or priority species to be present on site has been considered in this assessment, taking into account the nature of the site and the habitat requirements of the species in question. Absence of records does not constitute absence of a species. Habitats on the site may be suitable for supporting other protected species that have not previously been recorded within the search area. Conversely, presence of a protected species in the search area does not imply its presence on-site. Records of alien species, non-localised records (e.g. tetrad records) and records dated before 1995 have not been described in detail but are taken into account when considering likely species presence or absence.
- 2.1.6 The data supplied by the Records Centre were considered in the assessment of potential impacts below.

Limitations to desk study methodology

- 2.1.7 In accordance with BS42020 and advice from most Local Biological Record Centres, species lists are not appended to this report but are available to the Local Planning Authority on request.
- 2.1.8 Availability of records will vary in different locations, as many depend on the presence of local experts and survey effort within the local area. An absence of a record does not necessarily indicate the absence of that species.

2.2 Phase 1 habitat survey methodology

- 2.2.1 The standard Phase 1 (baseline) habitat survey methodology⁵ was followed. Phase 1 habitat survey is a standardised system for surveying, classifying and mapping wildlife habitats, including urban areas. All habitats present and areas or features of ecological interest within such habitats were recorded and mapped. The survey methodology facilitates a rapid assessment of habitats and it is not necessary to identify every plant species on site. Where given, scientific names of plant species follow the third edition of Stace.⁶
- 2.2.2 The survey visit was also used to identify potential for protected, rare and/or priority species, for example bats, mammals, amphibians and reptiles, to occur on, or in the vicinity of, the proposed development site. Although the survey methodology is not intended for species survey, any protected, rare and/or priority species which were seen during the survey were noted.
- 2.2.3 The survey was undertaken on 25th September 2019 and the weather conditions were sunny spells with heavy rain at times.

⁴ MAGIC: <https://magic.defra.gov.uk/MagicMap.aspx>.

⁵ JNCC (2010) *Handbook for Phase 1 Habitat Survey - a Technique for Environmental Audit*, JNCC, Peterborough.

⁶ Stace, C., (2010) *New Flora of the British Isles*, Third Edition, Cambridge University Press.

Limitations to Phase 1 habitat survey

- 2.2.4 The Phase 1 survey was undertaken in late September when many flowering plants would not be expected to be in flower or leave identifiable remains. As stated in 2.2.1 Phase 1 survey is not intended as a detailed species survey but for rapid habitat classification over large scales. In practice sufficient remnant vegetation can be expected to remain in-situ for the purposes of habitat classification into late autumn and as such Phase 1 survey in this period is not considered to be a limitation to survey.

2.3 Detailed botanical and vegetation surveys

- 2.3.1 The site was surveyed by Dr Jo Parmenter, a competent botanist, familiar with the rare and scarce species which might potentially be found in this area and with experience of both arable and grassland survey, on 25th September 2019. The entire site area was walked, with particular attention being given to the arable margins and areas of more diverse grassland associated with boundary features such as hedgerows. A total of c6 hours were spent walking the site and collating plant records for the habitat types present. .
- 2.3.2 A grid reference was recorded for every occurrence of any plant species considered to be of ecological importance, i.e.:
- Local Species of Conservation Concern
 - Wildlife and Countryside Act Sch8
 - NERC Act Section 41
 - UKBAP
 - Nationally Scarce
 - RedList_GB-Critically Endangered, Endangered, Vulnerable, Near-threatened, Lower Risk
 - Local BAP species
 - Any other notable species
- 2.3.3 To facilitate comparison of the field data with the lists in JNCC's TAXON Designations Spreadsheet⁷ scientific names of plants follow Stace Ed. 3⁸.
- 2.3.4 Areas of botanical interest are mapped at Figure 02.

Limitations to botanical survey

- 2.3.5 Survey was restricted to a single survey visit in late September, but was undertaken by a very experienced botanist familiar with the species interest of this part of the UK. Additional visits at varied times of year might result in further species being recorded as their visibility changes seasonally. A further visit is planned for July-time, which will identify those species which are more prominent in the spring and early summer.

2.4 Assessment methodology

- 2.4.1 The assessment was undertaken in accordance with the Chartered Institute of Ecology and Environmental Management's Professional Guidance Series⁹.
- 2.4.2 More details of the assessment methodology are provided in Appendix 2, but, in summary, the impact assessment process involves:
- identifying and characterising impacts;
 - incorporating measures to avoid and mitigate (reduce) these impacts;
 - assessing the significance of any residual effects after mitigation;
 - identifying appropriate compensation measures to offset significant residual effects; and

⁷ <http://jncc.defra.gov.uk/page-3408>

⁸ Stace, C 2010 *New Flora of the British Isles*. Cambridge University Press. 3rd Edition.

⁹ CIEEM (2016) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal*, Second Edition. Chartered Institute of Ecology and Environmental Management, Winchester.

- identifying opportunities for ecological enhancement.

- 2.4.3 The hierarchical process of avoiding, mitigating and compensating for ecological impacts is explained further below.
- 2.4.4 In Ecological Impact Assessment (EclA) it is only essential to assess and report significant *residual* effects (i.e. those that remain after mitigation measures have been taken into account). However, it is considered good practice for the EclA to make clear both the potential significant effects without mitigation and the residual significant effects following mitigation, particularly where the mitigation proposed is experimental, unproven or controversial. Alternatively, it should demonstrate the importance of securing the measures proposed through planning conditions or obligations.
- 2.4.5 Assessment of the potential impacts of the proposed development takes into account both on-site impacts and those that may occur to adjacent and more distant ecological features. Impacts can be positive or negative. Negative impacts can include:
- direct loss of wildlife habitats;
 - fragmentation and isolation of habitats through loss of connectivity;
 - disturbance to species from noise, light or other visual stimuli;
 - changes to key habitat features; and
 - changes to the local hydrology, water quality, nutrient status and/or air quality.
- 2.4.6 Negative and positive impacts on ecological features are characterised based on predicted changes as a result of the proposed activities. In order to characterise the impacts on each feature, the following parameters are considered:
- the magnitude of the impact;
 - the spatial extent over which the impact would occur;
 - the temporal duration of the impact and whether it relates to the construction or operational phase of the development;
 - the timing and frequency of the impact; and
 - whether the impact is reversible and over what time frame.
- 2.4.7 Both short-term (i.e. impacts occurring during the site clearance and construction phases) and long-term impacts are considered.
- Conservation status***
- 2.4.8 The extent to which the proposed development may have an effect upon ecological features should be determined in the light of its expected influence on the integrity of the site or ecosystem. The integrity of protected sites is considered specifically in the light of the site's conservation objectives. Beyond the boundaries of designated sites with specific nature conservation designations and clear conservation objectives, the concept of 'conservation status' is used. Conservation status should be evaluated for a study area at a defined level of ecological value. The extent of the area used in the assessment relates to the geographical level at which the feature is considered important.
- 2.4.9 For habitats, conservation status is determined by the sum of the influences acting on the habitats and their typical species that may affect their long-term distribution, structure and functions, as well as the long-term survival of its typical species within a given geographical area. For species, conservation status is determined by the sum of influences acting on the species concerned and inter-relationships that may affect the long-term distribution and abundance of its populations within a given geographical area.
- Confidence in predictions***
- 2.4.10 It is important to consider the likelihood that a change or activity will occur as predicted and also the degree of confidence in the assessment of the impact on ecological structure and function.
- **Certain** probability estimated at above 95%
 - **Probable** probability estimated above 50% but below 95%
 - **Possible** probability estimated above 5% but below 50%

- **Unlikely** probability estimated as less than 5%

Cumulative impacts

- 2.4.11 Consideration is also given to the potential for the development proposal to give rise to significant negative impact in combination with other proposed developments in the local area.

Overall assessment

- 2.4.12 An overall assessment of value and impact is provided. This is based upon the highest level or value of any of the features or species present, or likely to be present on the site. Similarly, the overall assessment of impact is the impact of greatest significance.

2.5 Mitigation hierarchy

- 2.5.1 The following principles underpin EcIA and have been followed, where applicable, in this assessment.

- **Avoidance** Seek options that avoid harm to ecological features (for example, by locating the proposed development on an alternative site or safeguarding on-site features within the site layout design).
- **Mitigation** Adverse effects should be avoided or minimised through mitigation measures, either through the design of the project or subsequent measures that can be guaranteed – for example, through a condition or planning obligation.
- **Compensation** Where there are significant residual adverse ecological effects despite the mitigation proposed, these should be offset by appropriate compensatory measures.
- **Enhancement** Seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation.

3 Results

3.1 Desk study results

Sites of European importance

- 3.1.1 The following site of European importance (a Special Area of Conservation) was identified within the search area, as detailed in the table below.

Site	Distance from development site (approx.)	Direction	Key habitat/features of interest
Eversden and Wimpole Woods	8km	SW	Ancient coppice woodland and high forest woods with a key colony of barbastelle bats <i>Barbastella barbastellus</i> .

Sites of national importance

- 3.1.2 The following sites of national importance (all Sites of Special Scientific Interest) were identified within the search area and are detailed within the table below.

Site	Distance from development site (approx.)	Direction	Key habitat/features of interest
Traveller's Rest Pit	1km	N	A unique geological exposure in Pleistocene fossiliferous cold stage gravels, sands and silts.
Histon Road	2.4km	NE	A key Pleistocene geological stratigraphic site.
Cherry Hinton Pit	4.8km	SE	Populations of four nationally uncommon plant species and areas of herb-rich chalk grassland.
Madingley Wood	1.8km	NW	Ash-maple woodland characteristic of the chalky boulder clay of Eastern England, of particular educational and research value due to long use by the University of Cambridge.

- 3.1.3 Site locations relative to the proposed development site are shown in Appendix 3.

Sites of local importance

- 3.1.4 The sites of local importance identified within the search area are detailed within the table below.

Site	Distance from development site (approx.)	Direction	Key habitat/features of interest
<i>Local Nature Reserves and County Wildlife Sites</i>			
Paradise	1.2km		Alder/stinging-nettle woodland
Sheep's Green and Coe Fen	800m	E	Grassland, rare plants and mature pollard willows.
<i>County Wildlife Sites</i>			
Adams Road Sanctuary	350m	NE	Important for rare and scarce invertebrates.
Barton Orchard	800m	SW	Traditional orchard management and veteran trees.
Barton Road Pool	250m	SE	Invertebrates.
Cambridge Botanic Gardens	1.5km	SE	Invertebrates and bryophytes.
Coton Path Hedgerow	Adjacent	N	Scarce plants.
Hedgerows East of M11	Within site	(NW)	Rare plants.
River Cam	600m	E & SE	Relatively natural river, with mature pollard willows.

Site	Distance from development site (approx.)	Direction	Key habitat/features of interest
Skaters' Meadow Group	1km	SE	Grassland.
<i>City Wildlife Sites</i>			
Ascension Parish Burial Ground	1.1km	N	Grassland indicator species.
Bin Brook	Within site	E & NE	Water vole, mature pollard willows and other semi-natural habitat.
Bird Sanctuary, Conduit Head	600m	N	Greater and lesser pond sedge swamps, woodland and great crested newts.
Drain at Garret Hostel Lane	500m	E	Unmodified drain supporting protected mammals.
Hobson's Conduit / Vicar's Brook	1.8km	SE	Relatively natural chalk stream and adjacent habitat, with pollard willows.
Hobson's Conduit North	1.3km	SE	Relatively natural chalk stream and adjacent habitat.
Little St Mary's Churchyard	900m	E	Scarce plants.
Lower Vicar's Brook, New Bit and Coe Fen Straits	1.1km	SE	Relatively natural chalk stream and adjacent habitat.
Meadow and Ditch Opposite King's College	600m	E	Undeveloped floodplain of the river Cam (CWS).
Meadows and Drains	1.1km	SE	Undeveloped floodplain of the river Cam (CWS), with pollard willows.
Midsummer Common	1.6km	NE	Undeveloped floodplain of the river Cam (CWS).
Perse Girls' School Reedbed	1.3km	SE	Undeveloped floodplain of the river Cam (CWS).
Scrub East of M11 Verge	100m	NW	Important scrub and hedgerow habitats.
Trinity Meadow	350m	NE	Grassland indicator species.
<i>Other</i>			
Coton Countryside Reserve	200m	W	Meadows and orchards within a working farm.

- 3.1.5 Further information and site locations relative to the proposed development site are shown in Appendix 3 and Appendix 4.

Protected, rare and/or priority species

- 3.1.6 A number of species records were returned for the search area. Records for protected, rare and/or priority species from within the search area are summarised below. In accordance with BS42020 and advice from most Local Biological Record Centres, species lists are not appended but are available to the Local Planning Authority on request.

Veteran trees

- 3.1.7 No veteran tree records were returned.

Plants

- 3.1.8 A number of records of notable plant species were returned. The following were recorded on or adjacent to the development site: common cudweed *Filago vulgaris*, common twayblade *Neottia*

ovata, field scabious *Knautia arvensis*, galingale *Cyperus longus*, prickly poppy *Papaver argemone*, sickle medick *Medicago sativa falcata*, slender tare *Vicia parviflora*, spreading hedge parsley *Torilis arvensis*, treacle mustard *Erysimum cheiranthoides* and yellow vetchling *Lathyrus aphaca*.

- 3.1.9 Other notable plants recorded in proximity to the development site include: butcher's broom *Ruscus aculeatus*, chicory *Cichorium intybus*, devil's bit scabious *Succisa pratensis*, dwarf spurge *Euphorbia exigua*, early meadow grass *Poa infirma*, field pepperwort *Lepidium campestre*, fine-leaved fumitory *Fumaria parviflora*, hoary plantain *Plantago media*, hound's tongue *Cynoglossum officinale*, lesser calamint *Clinopodium calamintha*, pyramidal orchid *Anacamptis pyramidalis*, ragged robin *Silene flos-cuculi*, stinking chamomile *Anthemis cotula*, stinking hellebore *Helleborus foetidus*, strawberry clover *Trifolium fragiferum*, wild pansy *Viola tricolor* and wild strawberry *Fragaria vesca*.

Invertebrates

- 3.1.10 No protected, rare and/or priority invertebrate species records were returned for the development site, although numerous records of insects were returned for the search area, particularly from the Adams Road Sanctuary County Wildlife Site nearby.

Amphibians including great crested newts

- 3.1.11 Numerous records of common toads *Bufo bufo*, common frogs *Rana temporaria* and great crested newts *Triturus cristatus* were returned from suburban Cambridge, including close to the development site, particularly the Coton Footpath and Adams Road Sanctuary County Wildlife Sites.

- 3.1.12 Records included data recording the presence of great crested newt in ponds to the north of the site dated 1988, 2006 and 2014. All three records relate to ponds 250-450m from the site boundary and set within urban development. Common toad and common frog were also recorded.

Reptiles

- 3.1.13 There was a number of records of grass snakes *Natrix helvetica* within the central northern part of the development site, as well as nearby to the north-east and south-east. Adder *Vipera berus* has been recorded in Barton, although this is on the far side of the M11. There was one record for slow worm *Anguis fragilis* approximately 1km southeast of the site.

Birds

- 3.1.14 Red List species, including lapwing *Vanellus vanellus*, merlin *Falco columbarius*, turtle dove *Streptopelia turtur*, cuckoo *Cuculus canorus*, lesser spotted woodpecker *Dendrocopos minor*, redwing *Turdus iliacus*, fieldfare *Turdus pilaris*, song thrush *Turdus philomelos*, spotted flycatcher *Muscicapa striata*, starling *Sturnus vulgaris*, yellow wagtail *Motacilla flava*, skylark *Alauda arvensis*, tree pipit *Anthus trivialis*, linnet *Linaria cannabina*, lesser redpoll *Acanthis cabaret*, house sparrow *Passer domesticus*, yellowhammer *Emberiza citrinella* and corn bunting *Emberiza calandra*, have been recorded on or adjacent to the development site. Others have been recorded in the search area, including curlew *Numenius arquata*, whimbrel *Numenius phaeopus*, Sandwich tern *Sterna sandvicensis*, black redstart *Phoenicurus ochruros*, ring ouzel *Turdus torquatus* and wood warbler *Phylloscopus sibilatrix*.

- 3.1.15 Amber List species, including barnacle Goose *Branta leucopsis*, marsh harrier *Circus aeruginosus*, kingfisher *Alcedo atthis*, swift *Apus apus*, dunnoek *Prunella modularis* reed bunting *Emberiza schoeniclus* and bullfinch *Pyrrhula pyrrhula*, have been recorded on or adjacent to the development site. Others have been recorded in the search area, including Bewick's swan *Cygnus columbianus bewickii*, greylag goose *Anser anser*, goldeneye *Bucephala clangula*, bittern *Botaurus stellaris*, honey buzzard *Pernis apivorus*, short-eared owl *Asio flammeus*, greenshank *Tringa nebularia*, green sandpiper *Tringa ochropus*, nightjar *Caprimulgus europaeus* and quail *Coturnix coturnix*.

Dormouse

- 3.1.16 No dormouse *Muscardinus avellanarius* records were returned.

Terrestrial Mammals including badgers

- 3.1.17 Records of badger *Meles meles*, polecat *Mustela putorius*, brown hare *Lepus europaeus*, harvest mouse *Micromys minutus* and hedgehog *Erinaceus europaeus* were returned for the search area, those for badgers included the development site itself.

Aquatic Mammals including water voles and otters

- 3.1.18 Records of otter *Lutra lutra* and water vole *Arvicola terrestris* were returned, including for the Bin Brook City Wildlife Site, which crosses the eastern part of the development site, and for the Adams Road Sanctuary County Wildlife Site, close by to the north-east.

Bats

- 3.1.19 There was a large number of records of bat species in the study area, including several records for sites to the north-west of the development site. Species included common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, serotine *Eptesicus serotinus* western barbastelle *Barbastella barbastellus* noctule *Nyctalus noctula* Daubenton's *Myotis daubentonii*, brown long-eared bat *Plecotus auritus*.

3.2 Phase 1 habitat survey results

- 3.2.1 Sixteen Phase 1 habitat categories were identified during the Phase 1 habitat survey and are shown on Figure 01. Each habitat is described below.

Management, setting and green infrastructure

- 3.2.2 The site lies to the west of the current urban edge of Cambridge within a broadly triangular area of land defined by the M11 to the west, A603 Barton Road to the south-east and University campus buildings to the north.
- 3.2.3 The site comprises predominantly medium sized arable fields with associated mature hedgerows and field drainage ditches. The site also includes a small farmstead (Dumpling Farm) and a small University estate maintenance and research establishment (Laundry Farm) set within an area of grazed and managed grassland.
- 3.2.4 The site is crossed by a minor flowing stream (Bin Brook) which crosses the site to the south before flowing north along the south-eastern boundary.
- 3.2.5 The wider landscape can be divided into urban development to the east and north with a more rural, arable dominated landscape to the south and west. Mature and continuous hedgerows and field headlands on site form mature and extensive site based green infrastructure while the M11 forms a moderate dispersal barrier to the west. Field hedgerows do connect to highways screening planting along both the M11 and woodland plantation along the Barton Road which will offer some functioning green infrastructure to the north and south. The main green infrastructure on site is offered by the bin Brook corridor which links to habitat beyond the M11 and the internal ditch network and ultimately with this feature's downstream corridor habitats within Cambridge itself.

A2.1 Dense continuous scrub

- 3.2.6 Small areas of scrub were present within the site, which were not extensive in size or frequency. Areas included outgrown field boundaries, unmanaged field corners and small unmanaged areas of land bordering the site. Species were typical of hedgerows, as described in 3.2.23 below.

A2.2 Scattered scrub

- 3.2.7 Small areas of scattered scrub and small trees lined the Bin Brook along the eastern boundary. Species included ash *Fraxinus excelsior*, hawthorn *Crataegus monogyna*, bramble *Rubus fruticosus*, alder *Alnus* sp. and elder *Sambucus nigra*.

A1.3.2 Mixed plantation woodland

- 3.2.8 A linear belt of mixed plantation woodland lay on the southern boundary adjacent to Barton Road and which was mirrored by a similar belt south of the road. Aerial photographs¹⁰ show the belt

¹⁰ Google Earth

as young saplings in approximately 1999 and comprising alternating lines of coniferous and broadleaved species. Species includes spruce *Picea* sp., Scot's pine *Pinus sylvestris*, ash, oak *Quercus robur* and *Quercus petraea*, field maple *Acer campestre*, hornbeam *Carpinus betulus*, hawthorn, dogwood *Cornus sanguinea* and dog rose *Rosa canina*. Due to the dense, closed canopy there was no developed ground flora present.

A1.1.2 Broadleaved plantation woodland

3.2.9 A smaller area of broadleaved plantation woodland was sited within the site to the east. This is also shown as young saplings in the 1999 aerial photograph.

3.2.10 Species present differed from the southern planting belt comprising pedunculate oak *Quercus robur*, sessile oak *Quercus petraea*, hazel *Corylus avellana*, sweet chestnut *Castanea sativa*, and hawthorn. The canopy was similarly dense and limited the formation of any ground flora.

A3.1 Scattered broadleaved trees

3.2.11 Scattered trees were present within the site but restricted to the small grassland fields north of Barton Road, east of Laundry Farm and areas adjacent to the access track to Dumping Farm. Species included mature and semi-mature ash, walnut *Juglans regia*, horse chestnut *Aesculus hippocastanum* and small-leaved lime *Tilia cordata* sp. The area north of Barton Road also supported remnant orchard fruit trees including both pear *Pyrus* sp. and apple *Malus* sp.

B4 Improved grassland

3.2.12 A number of the small fields of pasture surrounding Laundry Farm were stocked with sheep at time of survey, while others appeared to be in the process of re-seeding or re-establishment displaying the appearance of having been subjected to a herbicide application. It was therefore assumed that pasture surrounding Laundry Farm was likely to have been established with commercially available seed mixes at times and would include perennial rye-grass *Lolium perenne* and cultivars. Ruderal species were present in locations including common nettle *Urtica dioica*, broad-leaved dock *Rumex obtusifolius* prickly sowthistle *Helminthotheca echioides* and hogweed *Heracleum sphondylium*.

B2.2 Semi-improved neutral grassland

3.2.13 Areas of unmanaged or less intensively managed grassland were present within the small fields north of Barton Road and east of Bin Brook to the east of the site.

3.2.14 The field north of Barton Road appear little used or only occasionally grazed, and displayed a rough and tussocky sward dominated by cock's-foot *Dactylus glomerata* and false oat-grass *Arrhenatherum elatius* with ruderal species common as in 3.2.12 above. East of Bin Brook grassland was unmanaged and subject to encroachment by scrub and bramble growth but included a sward of false-oat grass, cock's-foot, Timothy-grass *Phleum pratense*, creeping thistle *Cirsium arvense* and creeping buttercup *Ranunculus repens*.

3.2.15 A number of conservation headlands and relatively diverse hedgebases were present around site which supported semi-natural grassland. It is anticipated that seeding may have occurred on wider headlands but many of the narrow headland and hedgebases, in particular to the north of the site in association with the County Wildlife Site hedgerows were considered to be established grassland. Grasses were typical of those noted elsewhere on site and with herbs including black medick *Medicago lupulina*, ragwort *Senecio jacobaea*, hoary ragwort *Senecio erucifolia*, black knapweed *Centaurea nigra*, bristly ox-tongue, smooth hawksbeard *Crepis capillaris*, hedge bedstraw *Galium album*, hop trefoil *Trifolium campestre*. Local to the CWS *Vicia parviflora* was also found.

G2 Running water

3.2.16 Bin Brook passes through the site and in places forms the site's eastern boundary. Where passing through the site to the east the Brook is designated a County Wildlife Site. The Brook runs for approximately 500m through the southern part of the site and does is not designated part of the CWS. Banks were generally well vegetated which precluded close survey of the brook bottom. Banks vegetation was generally ruderal in composition and included hairy willowherb *Epilobium hirsutum*, Himalayan balsam *Impatiens glandulifera*, bittersweet *Solanum dulcamara*, nettle,

bramble, occasional blackthorn and rough grassland typical of the majority of field headlands, dominated by cock's-foot and false oat-grass.

3.2.17 The Brook passes through the northern fringes of the site following the north-eastern site boundary. The Brook corridor is predominantly scrub lined and inaccessible for detailed survey but with areas of unmanaged grassland bordering its banks in places.

3.2.18 Wet ditches in the vicinity of Dumpling Farm included both common reed *Phragmites australis*, and reedmace *Typha latifolia* and a wet, but not flowing ditch north of the Barton Road tree belt was dominated by greater pond sedge *Carex riparia* with occasional supported, gypsywort *Lycopus europaeus*, with wild carrot *Daucus carota*, coltsfoot *Tussilago farfara*, ragwort and ribwort plantain *Plantago lanceolata* on the banks.

J1.1 Arable

3.2.19 The majority of the site comprised arable land in active cultivation. All fields were in a post-harvest state with some small areas managed as fodder or cover crops, these being the far north-western corner and the far northern field edge.

3.2.20 All fields were defined by hedges and/or ditches and the majority were cropped up to hedgebases.

3.2.21 Some areas within the site supported important and declining arable weeds including spreading hedge parsley *Torilis arvensis*, fluellen *Kickxia elatine* and *K. spuria*, broad-leaved spurge *Euphorbia platyphyllos* and dwarf spurge *Euphorbia exigua*.

J1.2 Amenity grassland

3.2.22 Two existing sports pitches in active use were included within the site, both along the eastern site boundary. Neither were inspected closely but both would be expected to be dominated by perennial rye-grass or cultivars with other species typical of managed grassland such as white clover *Trifolium repens*, dandelion *Taraxacum officinale* agg. and daisy *Bellis perennis*.

J2.1.1 Native species-rich intact hedge, J2.2.1 Native species-rich defunct hedge, J2.3.1 Native species-rich hedgerow with trees

3.2.23 The site supported extensive hedgerows throughout including the County Wildlife Site 'Hedgerows east of M11' located to the north-east. In general hedges were well maintained, dense, with minimal gaps and with evidence of regular siding.

3.2.24 Species were almost exclusively native broadleaved and of a diverse composition typical for hedgerows of this type and within the site's geographic location. Most hedgerows tended to display a composition based on a core range of species including hawthorn, blackthorn *Prunus spinosa*, plum *Prunus domestica*, dogwood, ash, hazel, oak, English elm *Ulmus procera*, elder and field maple. Bramble was also prevalent throughout. Less frequent species included privet *Ligustrum vulgare*, walnut *Juglans regia*, horse chestnut and within the County Wildlife Site, wayfaring tree *Viburnum lantana*. One hedge comprising exclusively hornbeam *Carpinus betulus* was present within the grounds of Laundry Farm.

3.2.25 Many hedgerows within the site also featured standard trees or various ages and conditions comprising mainly ash and oak.

J2.3.6 Dry ditch

3.2.26 Dry field ditches were associated with most field boundaries and hedgerows. Many were considered to be redundant with minimal likelihood of retaining water while others appeared likely to be seasonally or periodically inundated.

J3.6 Buildings/Hardstanding

3.2.27 Buildings on site were limited to those associated with Laundry and Dumpling Farms. None were assessed in detail but included both domestic dwellings, modern and traditional agricultural barns and the modern late 20th century University Estate Management facility at Laundry Farm.

J4 Bare ground

3.2.28 Bare ground was limited to minor site access tracks comprising tarmac and compacted aggregate and was not an extensive feature within the site.

Field signs/sightings

- 3.2.29 A badger sett and frequent badger latrines were found within the site. (Target Notes 04).

3.3 Detailed botanical survey

- 3.3.1 The data gathered during the site visit is reproduced as a full species list at Appendix 5.
- 3.3.2 Two types of habitat considered to be of particular botanical interest and value were recorded. The chalky soils support some botanically diverse grass margins; notable amongst which are those associated with the Coton Path Hedgerow CWS and the Hedgerows East of M11 CWS. The former supports the Nationally Scarce *Lathyrus aphaca*, which is Vulnerable at the national level, and also the Red-Listed *Vicia parviflora*, also considered to be Vulnerable. These two plants were not refound in September 2019, but the timing of the survey would make this less likely: a mid-summer survey might be expected to find these species. A population of *Vicia parviflora* was also found alongside the Hedgerows East of M11 CWS.
- 3.3.3 The second key area of habitat was the arable field margins. The soils are a chalky clay with impeded drainage, and in some parts of the site support a wide range of uncommon and declining arable weed species, including the Red-Listed and BAP/S41 species *Torilis arvensis*, a plant of arable field margins which is considered to be Endangered at a national level. Other notable arable margin plants include the uncommon or declining species *Kickxia elatine*, *Kickxia spuria*, *Euphorbia exigua* and *Euphorbia platyphyllos*.
- 3.3.4 Areas supporting notable grassland and arable species are mapped at Figure 02.

4 Evaluation of conservation status and impact assessment

4.1 Assessment rationale

- 4.1.1 The assessment is based on the ecological data presented within this report. Future changes in the wildlife present on site are beyond the scope of this report, unless specifically stated.

4.2 Evaluation of conservation status and assessment of designated sites

- 4.2.1 The ecological value of the site is considered below and evaluated using the methodology set out in Appendix 2 and in accordance with species legislation and planning policy, as outlined in Appendix 1.
- 4.2.2 Where surveys for protected species have not yet been undertaken, it is not possible to evaluate impacts, nor to identify the appropriate mitigation or avoidance measures.

Sites of European importance

- 4.2.3 The only site of European importance within a 10km radius of the development area is Eversden and Wimpole Woods Special Area of Conservation (SAC), which is situated approximately 8km from the south-western corner of the development site. Given the distance between the sites, and the fact that public open space would be created within the development, impact upon the SAC is unlikely, however Habitats Regulations Assessment should be undertaken to verify this.

Sites of national importance

- 4.2.4 There are four sites of national importance within the search area (SSSIs), two of which are designated for geological reasons. The two sites designated for ecological reasons are assessed as being of importance for wildlife at the **National** scale.
- 4.2.5 The impact of the proposed development upon sites of national importance is considered to be **Neutral**, due to the distance of the proposed development from the designated sites and the reasons for the sites' designation.

Sites of local importance

- 4.2.6 Ten County Wildlife Sites (two of which are also Local Nature Reserves) and 14 City Wildlife Sites lie within 2km of the site, along with the non-designated Coton Countryside Reserve. Seven of these lie within 500m, including one designated site wholly within the site boundary, one crossing it, and one running adjacent to its northern boundary. These sites are assessed as being of importance for wildlife at the **County** level.
- 4.2.7 The impact on designated sites within 500m of the proposed development is assessed as being potentially **Moderate Adverse**, rising to **Major Adverse** for the three sites on or adjacent to the site.
- 4.2.8 A **Neutral** or beneficial impact is considered to be deliverable subject to the inclusion of recommended avoidance and mitigation measures.

4.3 Evaluation of conservation status and assessment of habitats and green infrastructure

Habitats

- 4.3.1 All habitats on site offer varying degrees of ecological value. Those of higher value include the hedgerows, running watercourses, semi-improved grassland and woodland belts. These will offer foraging habitat for a range of birds, invertebrates, terrestrial mammals, bats and amphibians, while hedges support identified populations of scare plants.
- 4.3.2 Habitats of lower value include the arable fields and amenity grassland which are likely to support ground nesting birds when cropping cycles are favourable, foraging habitat for small populations of a range of common resident, summer and wintering birds and foraging for terrestrial mammals including badger. Less common species may be present at times. Hedgerows and watercourses will also provide some linkages to offsite habitats.

- 4.3.3 In general, the habitats present are not unusual or scarce in the local or wider landscape. A hedgerow survey and a repeat rare plant survey are recommended.
- 4.3.4 Habitats associated with the County and City Wildlife Sites are assessed as being of value at the **County** scale. All other habitats on site are assessed as being of value at up to the **Parish** scale.
- 4.3.5 Unmitigated impacts of a development upon the site habitats have the potential to provisionally result in impacts in the range **Moderate to Major Adverse**. Subject to the development of comprehensive site layout plans, further surveys and the inclusion of recommended mitigation, impacts in the range **Minor Adverse to Minor Beneficial** are considered likely.

Green infrastructure

- 4.3.6 Both the Bin Brook and site hedgerows provide habitat linkage at a site and parish level.

4.4 Evaluation of conservation status and assessment of species

Veteran trees

- 4.4.1 There are no known veteran trees present on the site and the value of the proposed development site is therefore **Negligible**. The impact of the proposed development upon veteran trees is **Neutral**.

Plants

- 4.4.2 A number of records of uncommon plant species were returned with the data search, specifically local populations of declining arable weeds and declining woodland ground flora, species typical of calcareous habitats, and the site features habitats which support these species. Further uncommon species and new locations for species known to be present on site were identified through a botanical survey. The value of the site for this group is considered to be **Medium** at the **County** scale. A further rare plant survey is recommended to be undertaken in mid- summer.

Invertebrates

- 4.4.3 The character of the habitats recorded at the site and the invertebrate records returned for the local area, suggests that the site has some potential to support protected, rare and/or priority invertebrates. Habitats of greatest value in this respect includes matures trees, hedgerows and hedge bases, rough grassland, scrub and the Bin Brook corridor. The value of the proposed development site for this group is assessed as **Lower** at the **Parish** scale.
- 4.4.4 Subject to the retention, enhancement and expansion of these habitats within the completed scheme the impact of the proposed development is assessed as **Neutral to Minor Beneficial**.

Amphibians including great crested newts

- 4.4.5 Great crested newts have been recorded in the local area and habitats on site are capable of offering terrestrial habitat for this species. The value of the site for this group is therefore **Unknown** subject to further survey. Subject to the retention, enhancement and expansion of habitats likely to support amphibians within the completed scheme the impact of the proposed development is assessed as **Neutral to Minor Beneficial**

Reptiles

- 4.4.6 In general, intensive arable landscapes have limited potential for supporting extensive populations of reptiles except where peripheral undisturbed or minimally managed, sun warmed headlands with good connectivity are present to allow less mobile species such as common lizard and slow worm to populate. There are few habitats present, with the exception of semi-improved grassland areas along the eastern boundary and grassland habitats adjacent to plantation and scrub, where such populations could establish. The absence of records for these less mobile species also suggests their absence from the local area.
- 4.4.7 Grass snake has been recorded in the local area and habitats associated with the Bin Brook have potential to support this species. The site is assessed as being of **Lower** value for reptiles at the **Parish** scale.
- 4.4.8 Further survey for this group is recommended to determine presence, absence and distribution. Subject to the retention, enhancement and expansion of habitats likely to support reptiles within

the completed scheme the impact of the proposed development is assessed as **Neutral to Minor Beneficial**.

Birds

Breeding birds

4.4.9 The site is likely to be used by common breeding bird species, both for nesting and foraging, with the woodland, hedgerows and arable fields being of greatest value in this respect. Less common species have the potential to use the site at times however the habitats present are not uncommon in the local or wider landscape and are unlikely to be of value to any one individual, population or species. Unmitigated impacts have the potential to give rise to loss of nesting habitat, noise and visual disturbances and the potential for predation of nests due to the introduction of domestic cats. Habitat for ground nesting birds such as skylark cannot be replaced however arable land dominates the wider local landscape.

4.4.10 Breeding bird survey is recommended to fully understand the value of the site to this group.

4.4.11 The value of the site to breeding birds is **Unknown**. Subject to the retention, enhancement and expansion of habitats likely to support breeding birds within the completed scheme the impact of the proposed development is assessed as **Neutral to Minor Beneficial**

Wintering birds

4.4.12 There are no habitats present on site which might support significant populations of wintering birds, although the site does offer some limited foraging potential for small numbers of common species. The site is considered to be of **Negligible** value for this group.

Dormice

4.4.13 There were no dormouse records returned for the site, and the site lies at the northernmost edge of this species normal range. The site does support a number of hedgerows but is otherwise isolated from favourable habitat. The site is therefore considered to be of **Negligible** value for this species and the impact of the proposed development is **Neutral**.

Aquatic mammals including water voles and otters

4.4.14 Both water vole and otter are known to be present in or use the Bin Brook. Where passing through the site the Brook does have some potential for supporting both these species, although this is considered limited for otter in the upper reaches.

4.4.15 Development impacting sections of the Brook or the Brook banks has the potential to adversely impact water vole. Survey to determine presence or absence of this species for those sections with the potential to be affected by development would be required. Such survey would also be used to identify signs of otter.

4.4.16 The value of the site to water vole is **Unknown** subject to survey. Subject to the retention, enhancement and expansion of habitats likely to support water-mammals within the completed scheme the impact of the proposed development is assessed as **Neutral to Minor Beneficial**.

Terrestrial mammals including badgers

4.4.17 Numerous signs of badger activity were noted on site, including at least one sett, probable territorial latrines and general dung pits. The site is therefore likely to form the territory of at least one badger clan which may or may not be wholly resident within the site. The site is therefore assessed as **Unknown** value for this species subject to further survey. Subject to the retention, enhancement and expansion of habitats likely to support badger within the completed scheme the impact of the proposed development is assessed as **Neutral to Minor Beneficial**.

Bats

Foraging/commuting potential

4.4.18 Hedgerows within the site are considered likely to be used by local populations of bats for commuting and foraging purposes. The site has good connectivity to urban habitats, via roads, garden habitats and the Bin Brook corridor, which are capable of supporting more light tolerant

species such as pipistrelle and also to more rural habitats to the south and west where less common species may also be present.

4.4.19 The value of the site to foraging and commuting bats is **Unknown**, subject to survey.

4.4.20 Subject to the retention, enhancement and expansion of habitats likely to support bats within the completed scheme the impact of the proposed development is assessed as **Neutral to Minor Beneficial**.

Roosting potential

4.4.21 There are a number of mature trees on site of an age and form capable of supporting roosting bats, as well as older and traditional buildings with a similar likely roost potential. Further survey of trees and buildings impacted by any development is required to assess value and impact. The value of the site to roosting bats is **Unknown**. Subject to the retention and expansion of roost features likely to support bats within the completed scheme the impact of the proposed development is assessed as **Neutral to Minor Beneficial**.

4.5 Cumulative impacts

4.5.1 There are no known cumulative impacts at the time of reporting.

4.6 Proposals for further survey or investigation

4.6.1 It is proposed that the following survey work be undertaken in order to establish whether protected habitats or species are present at the site. The seasons in which species may reliably be surveyed and a brief methodology are given in the table below.

Survey type	Season for survey	Methodology & Objectives
Hedgerow survey	May to October	A single survey visit to record species within hedgerows on site and note other qualifying features to regard hedgerow as 'important' under the Hedgerow Regulations (1997).
Rare plant survey	July	Resurvey of County Wildlife Sites to identify ascertain confirm presence of rare and scarce species in locations where previously recorded but not found in 2019 and walkover survey of entire site area.
Great crested newt survey	Habitat Suitability Index (HSI): Year round	Assessment of ponds within a minimum 250m of the site (where access can be gained) to determine suitability of habitat for supporting great crested newt.
	eDNA: Mid-April to end of June	<i>Subject to outcome of HSI assessment.</i> A single site visit to ponds to collect a water sample for laboratory analysis for GCN DNA presence. <i>NB: This method only identifies a presence/absence and does not provide a population estimate required for a NE EPS licence.</i>
	Pond survey: Mid-March to mid-June	<i>Subject to outcome of HSI and eDNA sampling outcomes</i> Four survey visits to establish presence or absence of species. If GCN are present, then a further two survey visits will be required to ascertain a population estimate. At least half of these surveys must be carried out within the peak breeding season (mid-April to mid-May).
Reptile survey	April to June and September to October	Seven survey visits, following the setting out of artificial refugia, to ascertain presence or absence. Survey to be targeted across site where suitable habitats exist.
Breeding bird survey	April to July	Three survey visits one per month to map territories of breeding birds.

Survey type	Season for survey	Methodology & Objectives
Badger survey	Year round (Spring/Autumn are optimal)	A single walkover survey to identify all badger setts, their status and field signs within and in close proximity to the site.
Water vole survey	April to September	Two survey visits to search suitable watercourses/bodies within and in close proximity to the site for field signs and resting places.
Otter survey	Year round (Spring is optimal)	Search of suitable watercourses/bodies within and in close proximity to the site for field signs and resting places.
Bat activity survey	April to October	One walked transect per month walked at dusk/dawn to ascertain species using the site and areas of higher activity. Also, deployment of two static detectors per transect per month recording for five nights.
Preliminary bat Roost Assessment (trees)	Year round	Assessment of all trees on site affected by development for potential to support roosting bats.
Preliminary bat Roost Assessment (buildings)	Year round	Assessment of all buildings on site proposed for demolition to enable development for evidence of or potential to support roosting bats
Bat emergence/re-entry survey	May to August	A m of three survey visits, comprising two dusk surveys and one dawn survey, to identify roosts within building(s), trees and other structures. Number of survey visits to be confirmed.

4.6.2 Habitats Regulations Assessment is required to identify any likely significant effect or adverse affect upon the integrity of a European site.

5 Mitigation and avoidance measures

5.1 Avoidance measures

5.1.1 **Protected species surveys are required as set out in Section 4.6 above. Until these surveys have been undertaken, it is not possible to identify accurately the likely avoidance and mitigation requirements in respect of these species. Recommendations below may therefore be indicative, provisional or incomplete until full studies are undertaken and results are known.**

5.1.2 The following impact avoidance measures have been identified.

Habitats

- All site boundary features, including scrub, woodland and hedgerows are to be retained and protected in the built scheme.
- Hedgerow severance to be minimise wherever possible and/or existing gaps to be utilised for new road access
- All mature trees will be retained in-situ.
- County Wildlife Site hedgerows to be buffered by at least 25m offset from new built development and fully protected from all development impacts (shading, severance, soil disturbance, materials storage)
- Autumn rotoation of arable land in proximity to the Hedgerows East of M11 County Wildlife Site to continue through the development period to ensure that rare plants can continue to germinate and seed following cessation of arable management
- Development, including heavy vehicle movements, except where pre-planned, to avoid all watercourse banks and a minimum of 2m back from the bank tops
- Ensure that no works come closer than Root Protection Zones of trees and shrubs (as a minimum)
- Woodland stands to be retained and afforded a minimum Root Protection Zone as advised by an Arboricultural Consultant

Rare plants

- Rotoation of County Wildlife Site land to continue through the development period to ensure that rare plants can continue to germinate following cessation of arable management
- Further survey required in July.

Great crested newt

- To be determined by survey

Reptiles

- To be determined by survey

Breeding birds

- Vegetation removal required for the construction phase should take place outside the bird breeding season of March to August inclusive, to prevent disturbance to birds, or if removed in that period, only after a survey has shown that no active nests are present.

Dormouse

- No measures required.

Water Vole

- To be determined by survey

Otter

- To be determined by survey

Badger

- Known setts to be retained and incorporated into the development
- Trenches should be filled in prior to the end of the working day, or a plank left leaning up from the base of the trench to the surface, so that animals falling in can get out of the excavation.
- Pipework should be closed off at the end of each working day to avoid badgers and other animals becoming trapped.

Bats

- To be determined by survey

5.2 Proposed mitigation for known impacts

5.2.1 The following mitigation is required to reduce the impacts of the scheme to within acceptable limits.

Habitats

- To mitigate for loss of vegetation, semi-natural planting should include berry-bearing native trees and shrubs to enhance food availability for wildlife. The proposed planting should be structurally diverse, with tree, shrub and ground layers, and areas of dense scrub as well as more open areas.
- Ornamental planting should constitute at least 50% by area of species of known value to wildlife (which might include native species), such as fruiting species and species known to provide a good nectar source. All ornamental planting should be structurally diverse, with tree, shrub and ground layers, and areas of dense planting as well as more open areas.
- Open glades, or areas of south-facing rough grassland within scrub habitats, should be maintained by mowing once a year, to prevent scrub encroachment and maintain a mosaic of habitat types.
- Site design to endeavour to create and maintain unbroken linear habitats throughout the site to retain north-south east-west green corridors.
- Arable land in proximity to the Hedgerows East of M11 County Wildlife Site to be used for non-built uses post development; creation of open grassland, allotments and community orchard in this areas would safeguard arable flora and hedge base grassland interest

Rare plants

- Community allotments to be located within 'Hedgerows East of M11' County Wildlife Site to ensure the cultivated conditions able to ensure the continued germination of species for which the CWS is designated.
- Other arable land in proximity to the Hedgerows East of M11 County Wildlife Site to be used for non-built uses post development; creation of open grassland and community orchard in this areas would safeguard hedge base grassland interest
- Further survey required in July.

Great Crested Newt

- To be determined by survey.

Reptiles

- To be determined by survey.

Breeding birds

- A reduction in nesting opportunities as a consequence of vegetation removal can be offset by the provision of bird boxes, which could be erected on retained standard trees elsewhere on site.

Dormouse

- No mitigation required.

Water Vole

- To be determined by survey.

Otter

- To be determined by survey.

Badger

- Measures, such as exclusion fencing, may be needed to prevent badgers from conflicting with the planned site use through excavations or foraging activity.
- Construction security fencing should be raised from the ground to provide gaps 100mm high and 300mm wide, at approximately 100m intervals around the boundary of the site, to allow the continued movement of mammals, including badger, across the site for foraging and commuting.

Bats

- If the proposed development is likely to give rise to any unforeseen impact upon retained trees, a bat roost potential survey should be undertaken to assess the extent of their suitability for roosting bats.
- Areas of scrub and trees, and linear features such as hedgerows, should be retained wherever possible throughout the site to allow nesting and foraging activity to continue.
- External lighting should be reduced to a minimum and designed in accordance with guidelines from the Bat Conservation Trust.¹¹
- The Bin Brook corridor should not be illuminated either deliberately or via light spill from the proposed buildings.
- Boundary habitats should not be illuminated, either directly or via light spill from adjacent buildings. If lighting is required for the site boundaries, e.g. for security, it should be reduced to a minimum, and designed in accordance with guidelines from the Bat Conservation Trust.¹²

5.3 Compensation for ecological impacts

- 5.3.1 To be determined by survey. Measures may include, but would not be limited to, creation of additional sections of hedgerow, new tree planting and creation of new wetland habitats.

5.4 Species licensing

- 5.4.1 A European Protected Species licence would be needed to implement any impacts upon otter, bats or dormice such as damaging a place used for shelter or disturbing the species in its place of shelter.
- 5.4.2 Should it to be necessary to damage or destroy a badger sett whilst it is in use, or disturb a badger in a sett, a licence would be required under the Protection of Badgers Act 1992.
- 5.4.3 A Natural England licence would be needed for any operation which disturbed water vole or damaged their habitat.

¹¹ See <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/> .

¹² See <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/> .

6 Enhancement measures

6.1 Ecological enhancement

- 6.1.1 Ecological enhancement aims to improve the quality of the site and the immediate vicinity for native flora and fauna. Such enhancements can also provide aesthetic appeal and can add value to the proposed development.
- 6.1.2 Enhancement opportunities specific to the development proposals for this site are provided below. It is not anticipated that all of these options would be utilised. The options are listed in order of priority, with habitat enhancements having most benefit to wildlife. Small-scale enhancements targeted at individual species, whilst valuable, are generally of less overall benefit than habitat enhancement measures. Many of these enhancements are shown in Figure 02 (Ecological Constraints and Opportunities).

6.2 Habitat enhancement

Biodiversity Net Gain

- 6.2.1 The Greater Cambridge Local Plan Issues and Options draft document (2019) is the first stage towards preparing a new joint Local Plan for Cambridge and South Cambridgeshire. As well as the ongoing need to provide for economic growth and jobs, and the homes needed to support them, the Draft document also identifies opportunity to reduce the local impacts of climate change, and deliver biodiversity benefit towards a target of doubling biodiversity.
- 6.2.2 Delivering biodiversity benefit through 'Biodiversity Net Gain', ensuring that development proposals not only mitigate and offset ecological impacts but also provide an overall benefit is a key deliverable of the Local Plan.
- 6.2.3 The Barton Road site offers a number of possibilities for delivering Biodiversity Net Gain and Ecosystems Services benefits.
- 6.2.4 An illustrative masterplan is provided at Appendix 6.
- 6.2.5 The soils are a chalky clay with impeded drainage, and in some parts of the site support a wide range of uncommon and declining arable weed species, including the Red-Listed and BAP/S41 species *Torilis arvensis*, a plant of arable field margins which is considered to be Endangered at a national level. Other notable arable margin plants include the uncommon or declining species *Kickxia elatine*, *Kickxia spuria*, *Euphorbia exigua* and *Euphorbia platyphyllos* and many of the arable field margins within the site are considered to meet the definition of the S41 Arable Field Margins habitat. The long term conservation of these and other declining arable species within the site would be met through the creation of a dedicated arable weed reserve, which would take the form of community allotments. This facility would be sited in an area which supports all of the above-listed species. The management-mosaic effect delivered by the differing patterns of cultivation within individual allotments is considered likely to not only safeguard and perpetuate populations of these uncommon plant species, but also allow their expansion and long term population security.
- 6.2.6 A number of the hedgerows on the site are species rich, and these would be retained within the development and efforts made to create further hedgerow linkages using a palette of species currently present on site, along with new hedgerow standard trees which would include native species (oak, hornbeam) already established as hedgerow standards and a number of the new Dutch Elm Disease-resistant elm cultivars. Cultivars would be selected for planting which are of a form appropriate to the local landscape, and which are suited to local climatic conditions. A third priority would be to choose cultivars favoured by white letter hairstreak and white spotted pinion; species which have declined considerably since the loss of mature elm trees from our landscape.
- 6.2.7 A number of the hedgerows on the site are species rich, and these would be retained within the development and efforts made to create further hedgerow linkages using a palette of species currently present on site, along with new hedgerow standards in the form of the new Dutch Elm Disease-resistant elm cultivars which are . Cultivars would be selected for planting which are of

a form appropriate to the local landscape, and which are suited to local climatic conditions. A third priority would be to choose cultivars favoured by white letter hairstreak and white spotted pinion; species which have declined considerably since the loss of mature elm trees from our landscape.

- 6.2.8 Additional scrub and woodland planting would be included within the wider scheme to increase the woodland cover and provide additional benefits for habitat connectivity and visual mitigation. Street trees would increase shading, biodiversity benefits and reflect the mature well-treed character of adjacent areas in west Cambridge.
- 6.2.9 The chalky soils support some botanically diverse grass margins; notable amongst which are those associated with the Coton Path Hedgerow CWS and the Hedgerows East of M11 CWS. The former is known to support the Nationally Scarce *Lathyrus aphaca*, which is Vulnerable at the national level (although this was not refound in a 2019 survey), and also the Red-Listed *Vicia parviflora*, also considered to be Vulnerable. A second population of *Vicia parviflora* was found alongside the Hedgerows East of M11 CWS in 2019. The hedgebase flora would be protected within the development and efforts made to extend this habitat into new, connected areas of permanent wildflower grassland, using plant material forage-harvested from the species rich grasslands on site.
- 6.2.10 A new community orchard would be created on the site, designed in accordance with the Traditional Orchards priority/S41 habitat type, and would be positioned so as to link to existing and proposed green corridors. Fruit trees would include traditional Cambridgeshire apple varieties such as Allington Pippin, Histon Favourite, Barnack Beauty and Emneth Early; and plums/gages including Cambridge Gage, Pershore, Burbank and Prince of Wales.
- 6.2.11 The Bin Brook City Wildlife Site where it flows through the site is heavily shaded with little bankside flora, and efforts would be made to open up the watercourse by selective removal or pollarding of the overhanging vegetation, and also to enhance the undesignated sections upstream, which have been heavily canalised, over-deepened and otherwise modified. These sections could be returned to their former course on a shallow gradient, building in meanders which follow the natural contours of the land, and reconnected with the former floodplain, creating areas of public open space and a naturally-functioning washland in the form of an extensively-grazed wetland corridor which could provide ecosystems service benefits in the form of enhanced 'blue infrastructure', greater upstream floodwater retention and new wetland biodiversity habitat, with direct benefits to the plants, invertebrates, birds and animals which live on the banks and within the riparian zone. Culverted sections would be re-opened and, where access is required, spanned by bridges which are elevated above the channel. The ditches that drain to the Bin Brook would be similarly restored, and designed into the overall drainage scheme for the built environment
- 6.2.12 Wherever possible, planting would use native species, which support biodiversity significantly better than non-native plants. This is due to the numbers of flowers, fruits, seeds and berries that are produced by our native species and their different flowering and fruiting times throughout the year.

Minor habitat enhancements

- A contribution to the 'B-Lines' project¹³ should be made by seeding with a native wildflower seed mix and use of native flowering trees and shrubs in the planting scheme.
- New wildlife ponds should be created.
- The boundary vegetation should be strengthened by further planting, including berry-bearing species to provide for bird foraging, and native species to attract insects. A structurally diverse range of plants should be used, including shrubs large enough to support nesting birds.
- Permanent wildflower grassland and native scrub habitat should be created along the site boundaries and within areas of public open space.

¹³ <https://www.buglife.org.uk/b-lines-hub>

- The retained woodland habitat should be enhanced by thinning out non-native deciduous and conifer tree species, and replacing them with native species appropriate to the local area.
- Structural native trees and shrubs should be planted to provide corridors across the site and a foraging resource for a variety of species.
- Planting on the site should be designed so as to link in to, or add to, surrounding areas of open space.
- Supplementary planting should be used to 'gap up' existing hedgerows and infill any gaps in tree and hedge lines to improve connectivity with the surrounding area. Areas highlighted for planting are the northern, eastern and western site boundaries. Native hedging plants local to the area and suitable for this purpose include Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa*, Field Maple *Acer campestre* and Hazel *Corylus avellana*.
- Wildlife habitat, including grassland, woodland and scrub, should be created on land outside the development site boundary.
- Sustainable Drainage System (SuDS) features should be enhanced using native wetland plants, and trees, shrubs, etc.
- Good practice in hedgerow maintenance should be employed, including cutting alternate sides of hedges on alternate years, which will benefit hedgerow species such as breeding birds, small mammals and bats.

6.2.13 These enhancements would benefit common invertebrates, breeding and wintering birds, badger foraging, and bat foraging.

6.3 Small-scale species enhancement measures

6.3.1 Small-scale enhancements to benefit individual species/species groups would include the following.

- 50 bat boxes (e.g. Schwegler), suitable for a range of bat species, should be erected on retained standard trees or buildings in unlit parts of the site.
- 50 bird boxes (e.g. Schwegler), suitable for a range of bird species, should be erected on retained standard trees or buildings in undisturbed parts of the site.
- 10 swift boxes should be erected on proposed buildings.
- 10 habitat piles should be created, using woody cut material (brash) from vegetation clearance. These should be stacked in a quiet, sheltered corner of the site to form piles measuring approximately 2m x 1m x 1m.
- 20 logs should be retained from each felled tree, and partly bury them in a quiet, sheltered corner of the site to provide deadwood beetle habitat, e.g. for stag beetle.
- Creation of hedgehog highways through fences; a gap of 13cm x 13cm should be cut out of the base of garden fences to allow hedgehogs to move through the site after construction is complete. Alternatively, include in fence design at least two Hedgehog Friendly Concrete Gravel Boards¹⁴ or similar per garden.

¹⁴ <https://www.kebur.co.uk/product/hedgehog-concrete-gravel-board/>

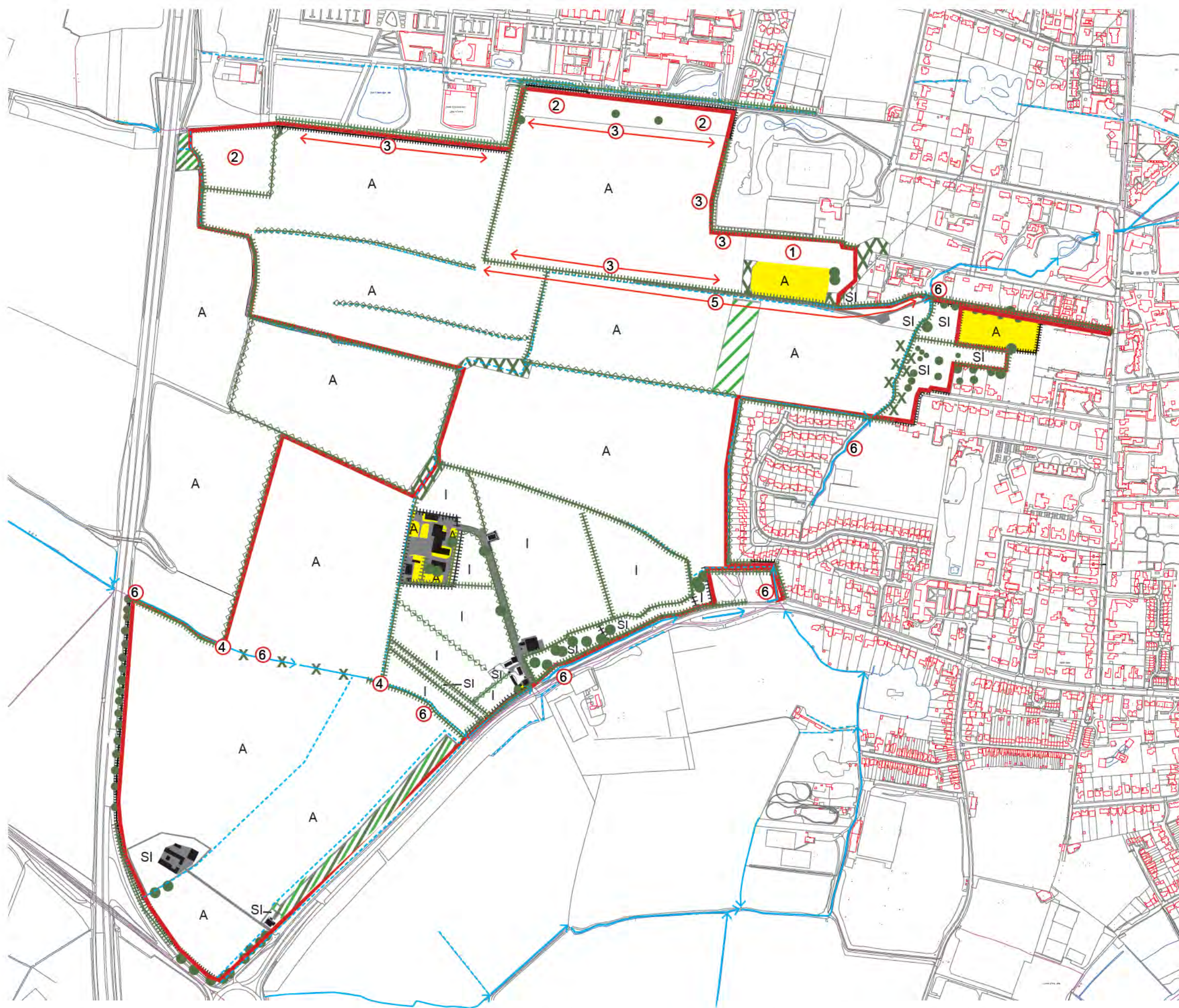
7 Conclusions

- 7.1.1 The purpose of this report was to inform a response to an 'Issues and Options' consultation of the Greater Cambridge Local Plan.
- 7.1.2 The overall value of the site to wildlife is **Unknown** subject to further detailed surveys. The Ecological Constraints and Opportunities Plan (Figure 02) provides a detailed overview of areas of wildlife importance at the proposed development site identified at current levels of study.
- 7.1.3 A summary of assessments of value and the impact of the proposed development without mitigation, and the residual significant effects following mitigation, is provided in the table below.

Feature	Level of value	Unmitigated impact	Confidence level	Mitigated impact
Sites of European importance	European	Unknown	-	-
Sites of national importance	National	Neutral	Certain	-
Sites of local importance	County	Moderate-Major Adverse	Probable	Neutral
Habitats	Parish	Major Adverse	Probable	Neutral
Veteran trees	Negligible	-	Certain	-
Plants	County	Moderate-Major Adverse	Probable	Neutral
Invertebrates	Lower	Parish	Probable	Neutral
Amphibians including great crested newts	Unknown	Unknown	Probable	Neutral
Reptiles	Unknown	Unknown	Probable	Neutral
Breeding birds	Unknown	Unknown	Probable	Neutral
Wintering birds	Negligible	Neutral	-	Neutral
Dormice	Negligible	Neutral	-	Neutral
Aquatic mammals including water voles and otters	Unknown	Unknown	Probable	Neutral
Terrestrial mammals including badgers	Unknown	Unknown	Probable	Neutral
Bats (roosting)	Unknown	Unknown	Probable	Neutral
Bats (foraging)	Unknown	Unknown	Probable	Neutral

- 7.1.4 An **Unknown** status indicates a need for further surveys to determine the value and impact of the development on protected habitats and/or species. Further survey requirements for this site includes great crested newts, reptiles, breeding birds, water vole, otter, badger and bats (roosting and foraging). Hedgerow survey would be required where removal is proposed.
- 7.1.5 The overall impact of the proposals is **Unknown** subject to further detailed surveys.
- 7.1.6 Beneficial impacts could be delivered through careful site design and adherence to mitigation and avoidance principles and to delivery of options for Biodiversity Net Gain.
- 7.1.7 Subject to the development of comprehensive site layout plans, further surveys and the inclusion of recommended mitigation, impacts in the range **Minor Adverse to Minor Beneficial** are considered likely.

Figures



KEY:

- Site boundary
- A2.1 Dense/continuous scrub
- X X A2.2 Scattered scrub
- A1.1.2 Broad-leaved plantation woodland
- A1.3.2 Mixed plantation woodland
- A3.1 Broadleaved scattered trees
- I B4 Improved grassland
- SI B6 Poor semi-improved grassland
- 1 Unmanaged rough grass with ruderal
- G2 Running water
- Field-boundary ditch
- A J1.1 Arable
- 2 Cover crop
- A J1.2 Amenity grassland
- J2.1.1 Intact / J2.2.1 Defunct native-species-rich hedge
- J2.3.1 Species-rich hedge with trees
- J2.3.4 Fence
- J3.6 Buildings
- J4 Hardstanding
- J4 Bare ground
- 3 Badger dung pits
- 4 Badger setts
- 5 Giant hogweed
- 6 Himalayan balsam present along watercourses

B19079 Barton Road, Cambridge

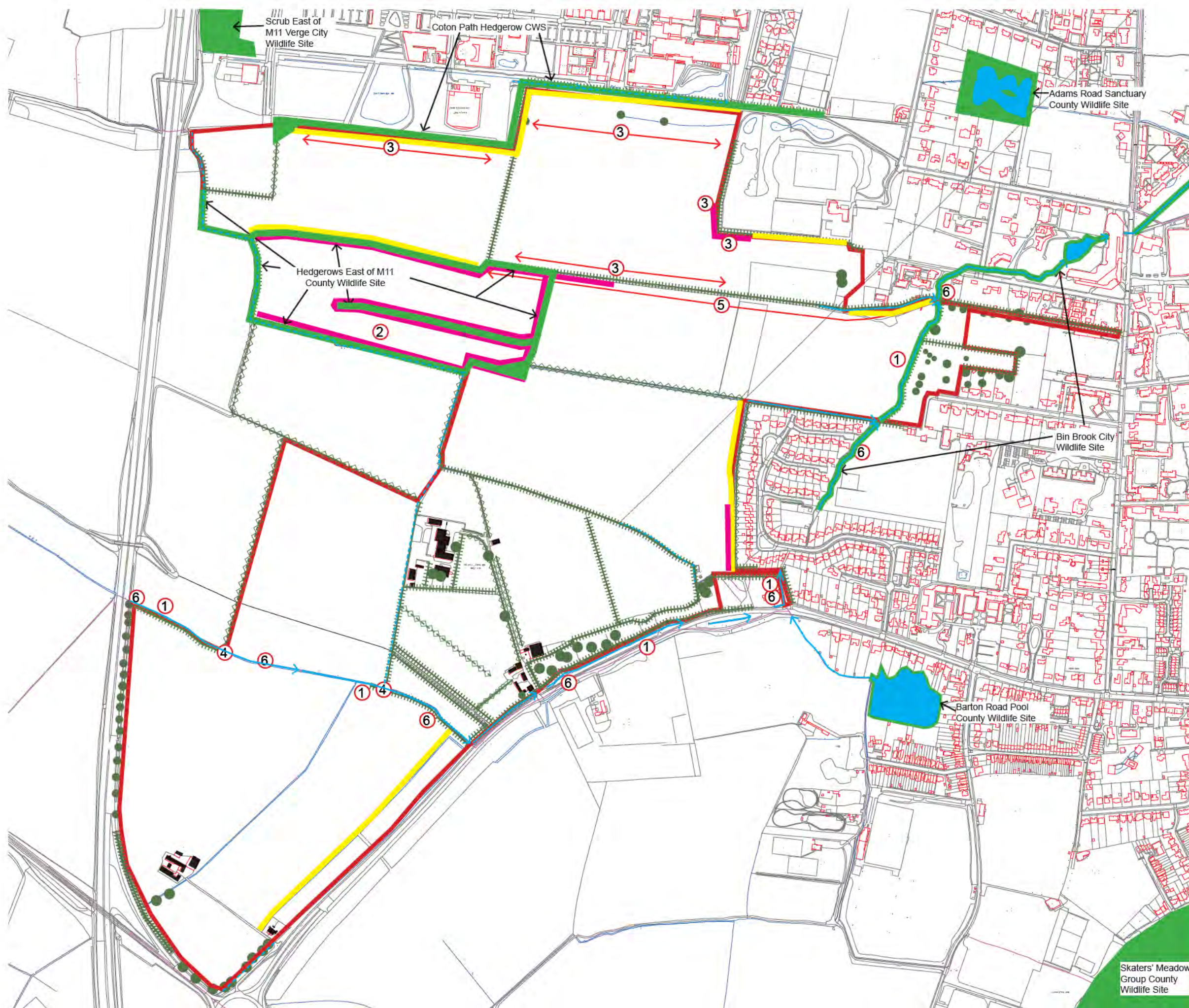
Phase 1 habitat survey

Figure 01

Scale: NTRS

October 2019

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KEY:



Site boundary

Opportunities

①

Renaturalise Bin Brook

②

Arable weed reserve or allotments

Constraints



County and City Wildlife Sites



Most hedges of exceptionally high quality



Grassland flora



Arable flora

③

Badger dung pits

④

Badger setts

Invasive plant species

⑤

Giant hogweed

⑥

Himalayan balsam present along watercourses

B19079 Barton Road, Cambridge

Constraints and opportunities

Figure 02

Scale: NTRS

October 2019



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Appendix 1

Legislative and policy context

There is a number of pieces of legislation, regulations and policies specific to ecology which underpin this assessment. These may be applicable at a European, National or Local level. References to legislation are given as a summary for information and should not be construed as legal advice.

Birds Directive

The European Community Council Directive on the Conservation of Wild Birds (79/409/EEC), normally known as the Birds Directive, sets out general rules for the conservation of all naturally occurring wild birds, their nests, eggs and habitats. It was superseded by the 'new' Birds Directive (2009/147/EC) which generally updated the previous directive.

These requirements are interpreted into English law by the Wildlife and Countryside Act 1981 (as amended) with regard to protection of birds, and the Conservation of Habitats and Species Regulations 2017 with regard to the registration and regulation of Special Protection Areas.

Habitats Directive

The European Community Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC), normally known as the Habitats Directive, aims to protect the European Union's biodiversity. It requires member states to provide strict protection for specified flora and fauna (i.e. European Protected Species) and the registration and regulation of Special Areas of Conservation.

These requirements are interpreted into English law by the Conservation of Habitats and Species Regulations 2017 with regard to European Protected Species and the registration and regulation of Special Areas of Conservation.

Conservation of Habitats and Species Regulations 2017

The Conservation of Habitats and Species Regulations 2017 interpret the Birds Directive and Habitats Directive into English and Welsh law. For clarity, the following paragraphs consider the case in England only, with Natural England given as the appropriate nature conservation body. In Wales, the Countryside Council for Wales is the appropriate nature conservation body.

Special Protection Areas and Special Areas of Conservation are defined in the regulations as 'European sites'. The Regulations regulate the management of land within European sites, requiring land managers to have the consent of Natural England before carrying out management. Byelaws may also be made to prevent damaging activities and if necessary land can be compulsorily purchased to achieve satisfactory management.

The Regulations define competent authorities as public bodies or statutory undertakers. Competent authorities are required to make an appropriate assessment of any plan or project they intend to permit or carry out, if the plan or project is likely to have a significant effect upon a European site. The permission may only be given if the plan or project is ascertained to have no adverse effect upon the integrity of the European site. If the competent authority wishes to permit a plan or project despite a negative assessment, imperative reasons of over-riding public interest must be demonstrated, and there should be no alternative to the scheme. The permissions process would involve the Secretary of State and the option of consulting the European Commission. In practice, there will be very few cases where a plan or project is permitted despite a negative assessment. This means that a planning application has to be assessed by the Local Planning Authority, based on information provided by the applicant, and the assessment must either decide that it is likely to have no significant effect on a European site or ascertain that there is no adverse effect upon the integrity of the European site.

Government policy is for Ramsar sites (wetlands of global importance) to be treated as if they were European sites within the planning process.

Appropriate Assessment

Appropriate Assessment is required in certain instances under the Conservation of Habitats and Species Regulations 2017. Regulation 63 says that:

63.— (1) A competent authority, before deciding to undertake, or give any consent, permission or other authorisation for, a plan or project which-

(a) is likely to have a significant effect on a European site or a European offshore marine site

(either alone or in combination with other plans or projects), and
(b) is not directly connected with or necessary to the management of the site,
must make an appropriate assessment of the implications for that site in view of that site's conservation objectives.

(2) A person applying for any such consent, permission or other authorisation shall provide such information as the competent authority may reasonably require for the purposes of the assessment or to enable them to determine whether an appropriate assessment is required.

(3) The competent authority shall for the purposes of the assessment consult the appropriate nature conservation body and have regard to any representations made by that body within such reasonable time as the authority may specify.

(4) They must also, if they consider it appropriate, take the opinion of the general public, and if they do so, they must take such steps for that purpose as they consider appropriate.

(5) In the light of the conclusions of the assessment, and subject to regulation 64 (considerations of overriding public interest), the competent authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site or the European offshore marine site (as the case may be).

(6) In considering whether a plan or project will adversely affect the integrity of the site, the authority must have regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given.

The competent authority is typically the local planning authority. The appropriate assessment contains the information the council requires for the purposes of its assessment under the Habitat Regulations.

The Habitat Regulations also are applicable to local authority land use plans and policies. If a policy or plan is likely to have a significant effect upon a European site, the permission may only be given if the policy or plan is ascertained to have no adverse effect upon the integrity of the European site. This approach gives rise to a hierarchy of plans each with related appropriate assessments. For example, the appropriate assessment of a Regional Spatial Strategy will affect policies within a Core Strategy, which will then need its own appropriate assessment, and so on.

European Protected Species

European Protected Species of animals are given protection from deliberate capture, injury, killing, disturbance or egg taking/capture. Their breeding sites or resting places are also protected from damage or destruction, which does not have to be deliberate. A number of species are listed as European Protected Species, with those most likely to be considered in planning applications being bats, dormouse, great crested newt and otter. Natural England may give a licence for actions that are otherwise illegal, subject to them being satisfied on the three tests of no alternative, over-riding public interest, and maintenance of the species in favourable condition.

European Protected Species of plant are also listed and given protection. These species are generally very rare and unlikely to be present in proposed development sites.

Wildlife and Countryside Act 1981

The Wildlife and Countryside Act 1981 has been amended many times, including by the Countryside and Rights of Way Act 2000. It contains provisions for the notification and regulation of Sites of Special Scientific Interest, and for protected species.

The Regulations regulate the management of land within Sites of Special Scientific Interest, requiring land managers to have the consent of Natural England before carrying out management.

All public bodies are defined as 'S28G' bodies, which have a duty to further the nature conservation of Sites of Special Scientific Interest in the undertaking of their functions. In practice, this prevents planning applications being permitted if they would harm Sites of Special Scientific Interest, as it would be a breach of that duty.

The Act makes it an offence intentionally to kill, injure, or take any wild bird, take, damage or destroy the nest of any wild bird, while that nest is in use or being built, or take or destroy an egg of any wild bird. Special penalties are available for offences related to birds listed on Schedule 1, for which there are additional offences of disturbing these birds at their nests, or their dependent young.

The Act makes it an offence intentionally to kill, injure or take any wild animal listed on Schedule 5, and prohibits interference with places used for shelter or protection, or intentionally disturbing animals occupying such places. Some species have lesser protection under this Act, for example white-clawed crayfish, common frog and toads are only protected from sale, and reptile species, other than smooth snake and sand lizard, are protected from intentional killing or injury, but they are not protected from disturbance and their habitat is not protected. It is also an offence intentionally to pick, uproot or destroy any wild plant listed in Schedule 8.

National Planning Policy Framework

The National Planning Policy Framework (NPPF) dated February 2019 replaces previous Government Policy in relation to nature conservation and planning expressed in the NPPF dated March 2012.

Chapter 15 paragraph 170(d) of the NPPF 2018 says that the planning system should contribute to and enhance the natural and local environment by minimising impacts on and providing net gains for biodiversity.

Paragraphs 171 and 172 relate to policy for designated sites of biodiversity or landscape importance. Proposals for any development on or affecting protected wildlife or geodiversity sites or landscape areas will be judged against Local Plans policies which will distinguish between the hierarchy of international, national and locally designated sites and allocate land with the least environmental or amenity value and maintain and enhance networks of habitats and green infrastructure. Further policy is within paragraph 174, where Local Planning Authorities should within their Local Plans aim to protect and enhance biodiversity by:

- Identifying, mapping and safeguarding components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation; and
- Promoting the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.

When determining planning applications Local Planning Authorities should apply the following principles:

- If significant harm resulting from a development cannot be avoided (through locating it on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused,
- development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
- development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to incorporate biodiversity improvements in and around developments should be encouraged, especially where this can secure measurable net gains for biodiversity.

Paragraph 176 adds protection to candidate sites of European or International importance (Special Protection Areas, Special Areas of Conservation and Ramsar sites) and also to those sites identified or required as compensatory measures for adverse effects on habitats sites, potential SPA, possible SAC listed or proposed Ramsar sites.

Paragraph 177 clarifies that the presumption in favour of sustainable development does not apply where development requiring appropriate assessment because of its potential impact on a habitats site (i.e. a SAC, SPA, Ramsar or candidate sites) is being planned or determined.

Government circular 'Biodiversity and Geological Conservation – Statutory Obligations and their Impact Within the Planning System' referenced ODPM 06/2005 has not been replaced and remains valid. It sets out the legislation regarding designated and undesignated sites and protected species and describes how the planning system should take account of that legislation. It does however pre-date the NERC Act 2006 (see below), which includes a level of protection for a further list of habitats and species regardless of whether they are on designated sites or elsewhere.

Natural Environment and Rural Communities (NERC) Act 2006

This Act includes a list of habitats and species of principal importance in England. Local Authorities are required to consider the needs of these habitats and species when making decisions, such as on planning application.

Local Planning Authority's planning policy

The Local Planning Authority will have policies relating to biodiversity conservation.

Species Legislation

The following table provides an overview of legislation with regard to species.

Protected Species	Legislation			
	Wildlife & Countryside Act, 1981	The Conservation of Habitats and Species Regulations, 2017	Natural Environment & Rural Communities (NERC) Act, 2006	Protection of Badgers Act, 1992
Plants (certain 'rare' species)	✓	✓ ¹⁵	✓	
Invertebrates (certain 'rare' species)	✓	✓ ¹⁶	✓	
White-clawed crayfish	✓		✓	
Great crested newt, natterjack toad, pool frog	✓	✓	✓	
Other amphibians	✓ ¹⁷		✓	
Sand lizard, smooth snake	✓	✓ ¹⁸	✓	
Other reptiles	✓ ¹⁹		✓	
Breeding birds	✓	✓	✓	
Wintering birds (certain 'rare' species)	✓	✓	✓	
Bats	✓	✓	✓	
Dormouse	✓	✓	✓	
Water vole	✓		✓	
Otter	✓	✓	✓	
Badger				✓

¹⁵ Nine species present in the UK, with very specialised habitat requirements, are European Protected Species.

¹⁶ Fisher's estuarine moth, large blue butterfly and lesser whirlpool ram's-horn snail are European Protected Species.

¹⁷ The four other native amphibian species (smooth and palmate newts, common frog and common toad) are only protected against trade under this act.

¹⁸ Smooth snake and sand lizard are European Protected Species.

¹⁹ The four other native reptile species (common lizard, slow worm, grass snake and adder) are protected against intentional killing, injury and trade under this act.

Appendix 2

Assessment Methodology: Valuing Ecological Features and Impact Assessment

The three-stage assessment method for determining ecological value is based upon assessment matrices published in the Handbook of Biodiversity Methods²⁰. It has been updated to comply with recent changes to planning policy and legislation. The three-stage process allows the value of ecological sites, habitats and populations, and the magnitude of the impact, to be cross-tabulated to identify impact significance.

Valuing ecological sites, habitats and populations: scale and level of value

Level of value	Sites, habitats and populations
European	Statutory sites designated under international conventions or related national legislation, for example: - Wetlands of International Importance (Ramsar sites), - Special Areas of Conservation, - Special Protection Areas.
National	Statutory sites designated under national legislation, for example: - Sites of Special Scientific Interest (England, Wales, Scotland), - National Nature Reserves (UK). Significant viable areas of habitats, or populations or assemblages of species of principal importance for the conservation of biodiversity in England and Wales (Section 41 species and habitats)²¹ of such size and quality as might qualify for SSSI designation. Populations or assemblages of red-listed, rare or legally protected species, as might qualify for SSSI designation, for example: - species of conservation concern, - Red Data Book (RDB) species, - birds of conservation concern (Red List species), - nationally rare and nationally scarce species, - legally protected species.
County	Statutory sites of lower conservation value designated under national legislation, for example Local Nature Reserves (UK). Non-statutory sites designated under local legislation, for example: - County Wildlife Sites, - Local Wildlife Sites, - Roadside Nature Reserves (protected road verges). Viable areas of habitat or populations of species of principal importance for the conservation of biodiversity in England and Wales (Section 41 species and habitats)²² of such size and quality as might qualify for designation at the county level. Other non-designated sites which meet the criteria for designation at this level.

²⁰ Hill, D., Fasham, M., Tucker, G., Shewry, M., Shaw, P. (eds.) (2005) *Handbook of Biodiversity Methods: Survey, Evaluation and Monitoring*, Cambridge University Press.

²¹ Listed under S41 of the Natural Environment and Rural Communities Act 2006 <http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>.

²² Listed under S41 of the Natural Environment and Rural Communities Act 2006 <http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>.

District / Borough²³	Sites meeting criteria for metropolitan designations. Undesignated sites or features not meeting criteria for county designation, but that are considered to enrich appreciably the habitat resource within the local district or borough, for example: • ancient woodland, • diverse, ecological valuable and cohesive hedgerow networks, • significant clusters or groups of ponds, • veteran or ancient trees. Viable areas of habitat or populations of species of principal importance for the conservation of biodiversity in England and Wales (Section 41 species and habitats)²⁴ not qualifying for designation at the county level.
Parish	Areas of habitat considered to enrich appreciably the ecological resource within the context of the local parish. Small areas of habitat or populations of species of principal importance for the conservation of biodiversity in England and Wales (Section 41 species and habitats)²⁵.
Site only	Ecological feature or resource not meeting any of the above criteria.

Note: there is much overlap in designations and lists of important species, and many sites, habitats and species appear on several. Where a site, habitat or species has multiple designations or levels of protection, normally the highest level would be the level at which impacts are assessed.

²³ Including metropolitan boroughs.

²⁴ Listed under S41 of the Natural Environment and Rural Communities Act 2006 <http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>.

²⁵ Listed under S41 of the Natural Environment and Rural Communities Act 2006 <http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>. Listed under S41 of the Natural Environment and Rural Communities Act 2006 <http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>.

Definitions of impact magnitude

Magnitude (negative or positive)	Definition/trigger
Severe	Loss or severe degradation affecting over 75% of a site feature, habitat or population. Adverse change to, or reduced condition of, over 90% of a site feature, habitat or population, for example through disturbance or trampling.
Major	Loss or severe degradation affecting over 25% of a site feature, habitat or population. Adverse change to, or reduced condition of, over 50% of a site feature, habitat or population, for example through disturbance or trampling. For benefits, an impact equivalent in nature conservation terms to a gain of over 50% in a site feature, habitat or population.
Moderate	Loss or severe degradation affecting over 5% of a site feature, habitat or population. Adverse change to, or reduced condition of, over 10% of a site feature, habitat or population, for example through disturbance or trampling. For benefits, an impact equivalent in nature conservation terms to a gain of 10-50% in a site feature, habitat or population
Minor	Loss or severe degradation affecting up to 5% of a site feature, habitat or population. Adverse change to, or reduced condition of, 1-10% of a site feature, habitat or population, for example through disturbance or trampling. For benefits, an impact equivalent in nature conservation terms to a gain of up to 10% in a site feature, habitat or population.
Insignificant	No loss of or severe degradation to a site feature, habitat or population. Adverse change to, or reduced condition of, less than 1% of a site feature, habitat or population. No benefit to a site feature, habitat or population.

Impact significance

Value of site, habitat or population	Magnitude of impact							
	<i>Severe Negative</i>	<i>Major Negative</i>	<i>Moderate Negative</i>	<i>Minor Negative</i>	<i>Insignificant</i>	<i>Minor Positive</i>	<i>Medium Positive</i>	<i>Major Positive</i>
<i>European (Very High)</i>	Severe Adverse	Severe Adverse	Major Adverse	Major Adverse	Neutral*	Major Beneficial	Major Beneficial	Major Beneficial
<i>National (High)</i>	Severe Adverse	Major Adverse	Major Adverse	Moderate Adverse	Neutral*	Moderate Beneficial	Major Beneficial	Major Beneficial
<i>County/Metropolitan (Medium)</i>	Major Adverse	Major Adverse	Moderate Adverse	Moderate Adverse	Neutral	Minor Beneficial	Moderate Beneficial	Major Beneficial
<i>District/Borough (Lower)</i>	Major Adverse	Moderate Adverse	Moderate Adverse	Minor Adverse	Neutral	Minor Beneficial	Moderate Beneficial	Moderate Beneficial
<i>Parish (Lower)</i>	Moderate Adverse	Moderate Adverse	Minor Adverse	Minor Adverse	Neutral	Minor Beneficial	Minor Beneficial	Moderate Beneficial
<i>Minimal/negligible</i>	Neutral	Neutral	Neutral	Neutral	Neutral	Minor Beneficial	Minor Beneficial	Moderate Beneficial

Where the impact significance falls below Minor Adverse, the term 'Neutral' is used.

*In some circumstances, some 'insignificant' impacts might fail legislative or policy tests and the impact would be greater than Neutral.

Appendix 3

Designated Sites Map (Overview)

for The Landscape Partnership

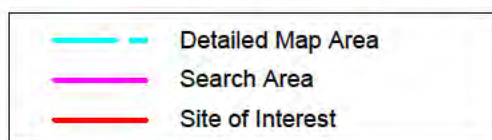
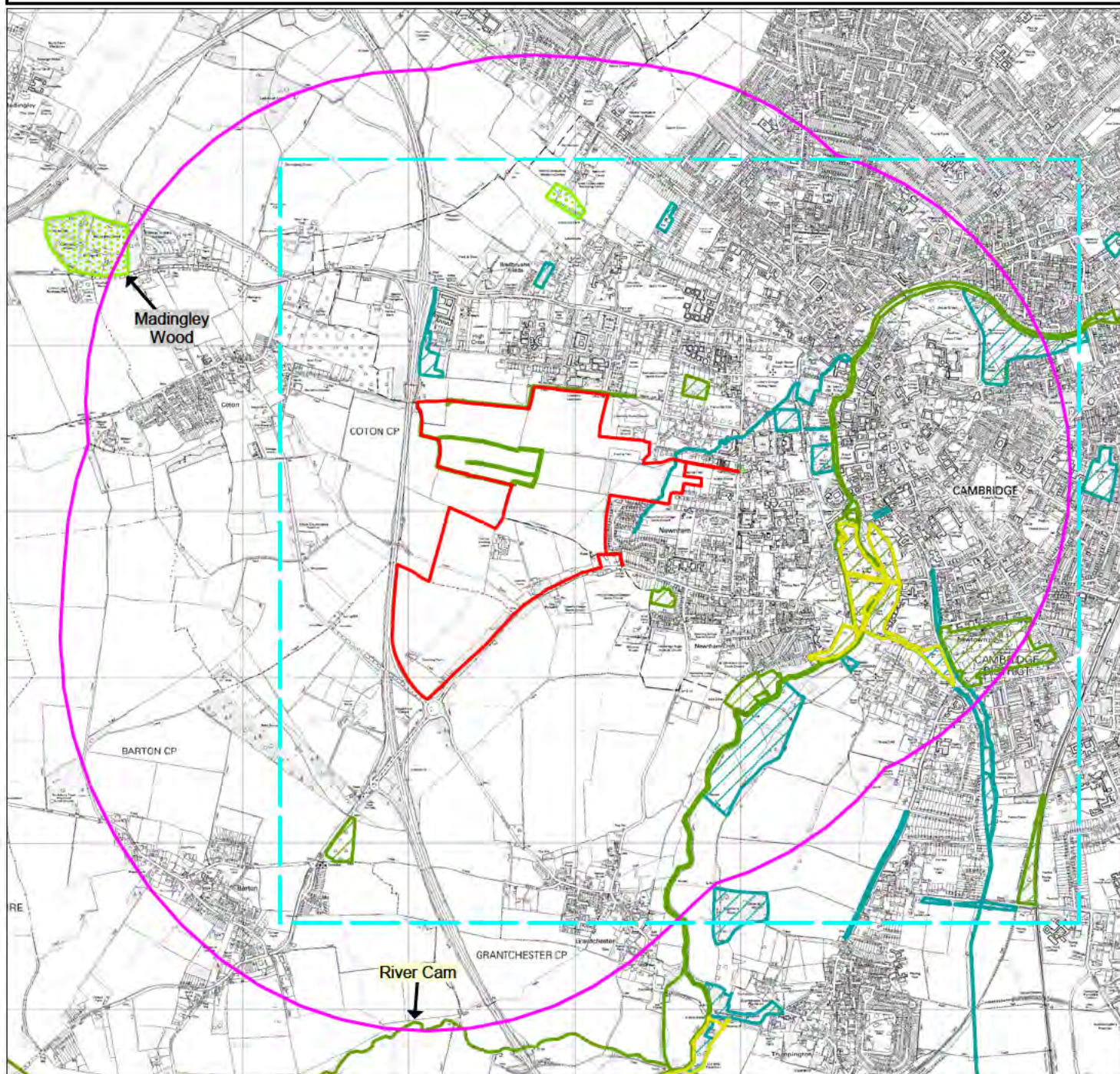
Cambridge

28/08/2019

1:35,000

CPERC
The Manor House
Broad Street
Cambourne
Cambridgeshire
CB23 6DH

CPERC
CAMBRIDGESHIRE & PETERBOROUGH
ENVIRONMENTAL RECORDS CENTRE



SSSI



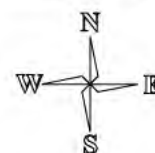
LNR



County Wildlife Site



City Wildlife Site (Cambridge City)



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Cambridgeshire County Council 100023205 (2019)

Designated Sites Map (Detailed)

for The Landscape Partnership

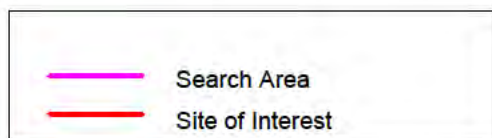
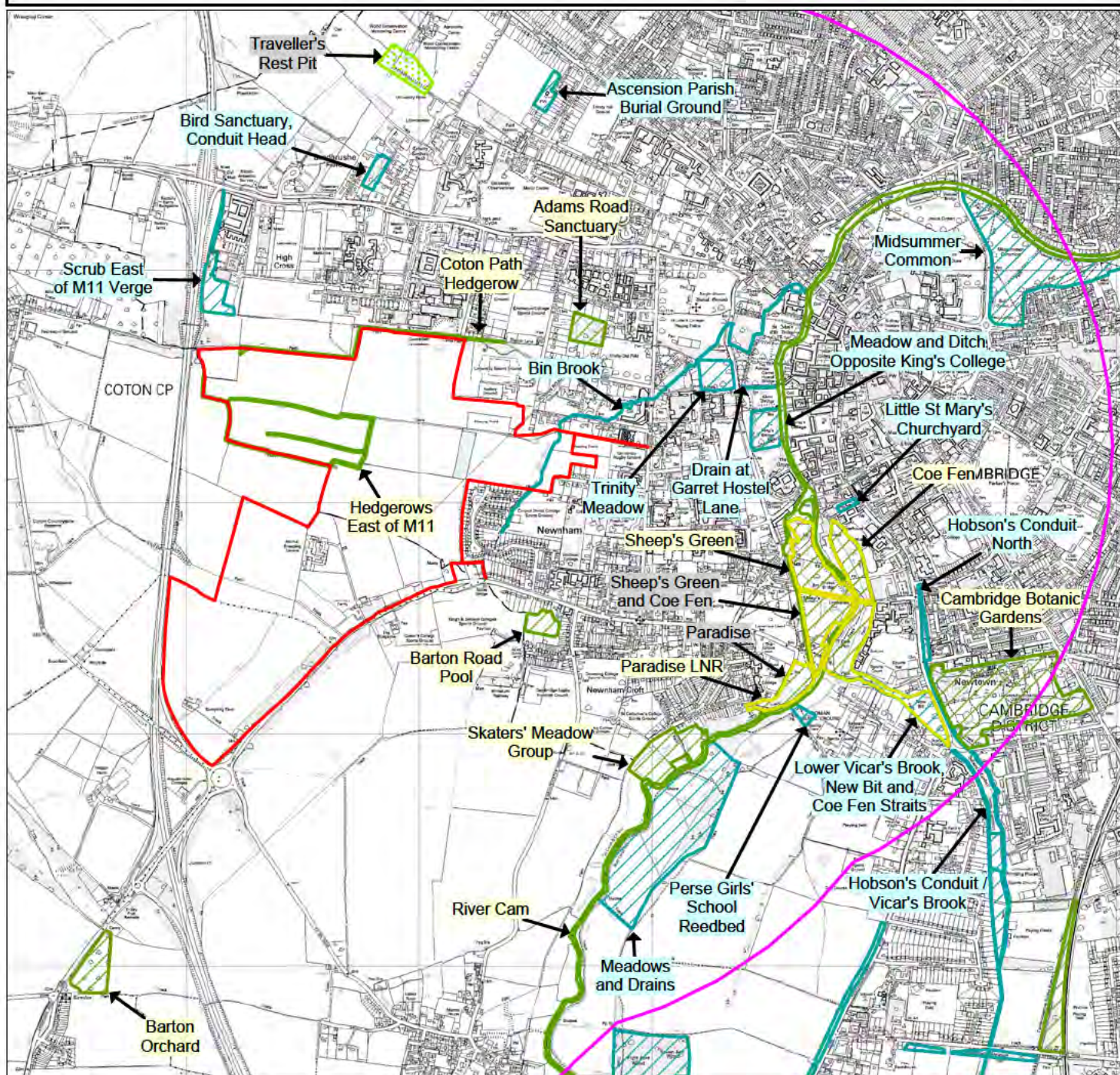
Cambridge

28/08/2019

1:25,000

CPERC
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Broad Street
Cambourne
Cambridgeshire
CB23 6DH

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CAMBRIDGESHIRE & PETERBOROUGH
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SSSI



LNR



County Wildlife Site



City Wildlife Site (Cambridge City)



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Appendix 4

SITE RECORD SHEET

SITE NAME: Bin Brook
Site code: D4.4
Grid ref: TL438584
Date of survey: 6/10/05
Surveyor: Steve Hartley

Habitat information

Code	Habitat type
A2.2	Scrub: scattered
A3.1	Parkland/scattered trees: broadleaved
B6	Grassland: poor semi-improved
F2.1	Marginal/inundation: marginal
G2	Open water: running water

Site area:

0.79 ha

Site description

This site includes the entire length (approximately 2.2 km) of the Bin Brook within Cambridge, from where it enters the city at TL432576, having risen around 3km to the north-west in Coton, to the confluence with the River Cam at TL446589. For descriptive purposes the brook has been divided into 8 sections based on differing surroundings and vegetation. Access problems meant that parts of the brook were difficult to survey fully.

Gough's Way area, 310m total. The brook enters the city from Barton Road, and after flowing a short way north along the city boundary is culverted beneath Gough's Way and then runs beside Corpus Christi Sports Ground. The water in these lengths appears clean, but the brook is shaded by frequent trees, shrubs and large patches of Bramble *Rubus fruticosus* agg. Fool's Water-cress *Apium nodiflorum* grows reasonably in occasional windows; bank vegetation is largely woodland plants such as Hairy-brome *Bromopsis ramosa* and Stinking Iris *Iris foetidissima*. A group of 13 mature pollard White Willow *Salix alba* grows beside the sports ground. They are apparently in active management, but the trees and scrub around them are suppressing them, with some of the Ash *Fraxinus excelsior* trees overtopping them; the trees and scrub should be removed with the next pollarding work, benefiting the brook vegetation as well.

Selwyn Meadow, 310m. The brook next flows between Selwyn Meadow on the east and a grass ley on the west. The ley appears very well-fertilised. At the start of this section the water is clear, but by the end the water is silty and eutrophic with much growth of filamentous alga. The brook is somewhat shaded on the eastern bank by a mature and gappy hedgeline, mostly Ash, Hawthorn *Crataegus monogyna* and large Bramble patches; the western bank is open. Channel vegetation is abundant in places but not very diverse,

being nearly all Fool's Water-cress and a water-starwort *Callitriche* sp. upstream of the filamentous alga. Bank vegetation is generally coarse and, especially on the western bank where slubbings have been piled, rather tall and ruderal, including Hemlock *Conium maculatum* and Common Nettle *Urtica dioica*.

End of Herschel Road, 130m. The brook next flows through an area of student accommodation at the end of Herschel Road which was largely inaccessible and not surveyed in detail. The brook here appears largely well-shaded with little channel growth. Bankside vegetation is woodland plants such as False-brome *Brachypodium sylvaticum*.

Robinson College, 350m. The brook flows on through Robinson College, again largely inaccessible. Part of the brook forms a pond in the college grounds, but much of this stretch is similar to the previous section.

Cobbett's Corner and Trinity Fellows' Garden, 260m. The brook passes under Grange Road and flows through Cobbett's Corner before running past Trinity Fellows' Garden. Through Cobbett's Corner the brook is heavily shaded by mature trees, and the bottom is full of detritus; there is no channel growth or marginal vegetation, and bankside vegetation is nearly all Ivy *Hedera helix*. In places the banks are high brick walls providing an area for frequent Hart's-tongue *Phyllitis scolopendrium*. The stretch through Trinity Fellows' Garden was not surveyed in detail but an impression gained from a previous visit was of reasonable channel and marginal growth of moderate diversity in the unshaded areas. Water Voles are reported still present by the Trinity College head gardener.

St John's College playing field, 210m. Here the brook is heavily shaded in places by numerous mature Sycamore *Acer pseudoplatanus*. Even in the open areas riparian vegetation is limited to Water Figwort *Scrophularia auriculata* and Meadowsweet *Filipendula ulmaria*; bankside vegetation is mostly rank species such as Common Nettle or woodland plants such as Ivy.

Queens' Road, 80m. The brook is narrow and severely canalised with vertical concrete piling on the east and a steep brick wall on the west, trees shade from the east. The brick affords limited opportunity for marginal vegetation, mostly Water Figwort; there is no channel vegetation.

St John's College, 550m. In this long section through the main grounds of St John's College the brook has been severely canalised with vertical prefabricated concrete banks. Severe shade is cast by numerous mature trees. There is almost no life in this section, channel growth being restricted to wisps of filamentous alga in the eutrophic and silty water, with the bottom full of detritus. The brook forms a large pool just before its confluence with the Cam, which is used to moor punts, and likewise has little growth.

Patches of Indian Balsam *Impatiens glandulifera* are occasional along much of the site.

Site assessment

This site qualifies as a City Wildlife Site because it supports breeding populations of a mammal species protected by the Wildlife and Countryside Act 1981 (criterion 2.27). It also qualifies for its group of at least 5 mature pollard willows in association with other semi-natural habitat (criterion 2.7a). Though poor water quality and canalisation through much of its length prevent the site qualifying as a chalkstream (criterion 2.14), the upper reaches of the site could easily be rehabilitated.

SPECIES LISTS

Gough's Way area

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Aegopodium podagraria</i>	Ground-elder		lf	
<i>Alliaria petiolata</i>	Garlic Mustard		o	WP
<i>Anthriscus sylvestris</i>	Cow Parsley		o	
<i>Apium nodiflorum</i>	Fool's Water-cress		lf	
<i>Ballota nigra</i>	Black Horehound		lf	
<i>Brachypodium sylvaticum</i>	False-brome		o	WP
<i>Bromopsis ramosa</i>	Hairy-brome		o	WP
<i>Calystegia sepium</i>	Hedge Bindweed		r	
<i>Cirsium arvense</i>	Creeping Thistle		lf	
<i>Crataegus monogyna</i>	Hawthorn		o	WS
<i>Dipsacus fullonum</i>	Wild Teasel		r	
<i>Epilobium hirsutum</i>	Great Willowherb		r	
<i>Filipendula ulmaria</i>	Meadowsweet		r	WP
<i>Fraxinus excelsior</i>	Ash		o	WP
<i>Galium aparine</i>	Cleavers		r	
<i>Geranium robertianum</i>	Herb-Robert		o	WP
<i>Glechoma hederacea</i>	Ground-ivy		lf	WP
<i>Hedera helix</i>	Ivy		o-la	WP
<i>Impatiens glandulifera</i>	Indian Balsam		r	
<i>Iris foetidissima</i>	Stinking Iris		r	WP
<i>Rubus fruticosus</i> agg.	Bramble		o-la	WP
<i>Rumex obtusifolius</i>	Broad-leaved Dock		o	
<i>Salix alba</i>	White Willow		lf	
<i>Sambucus nigra</i>	Elder		o	WS
<i>Scrophularia auriculata</i>	Water Figwort		o	
<i>Solanum dulcamara</i>	Bittersweet		r	
<i>Stachys sylvatica</i>	Hedge Woundwort		o	WP
<i>Urtica dioica</i>	Common Nettle		f-la	

Adjacent to Selwyn meadow

Scientific name	Common name	Abundance		Status
		1998	2005	
	filamentous alga		o-lf	
<i>Acer campestre</i>	Field Maple	r	r	WS
<i>Alliaria petiolata</i>	Garlic Mustard		r	WP
<i>Alnus cordata</i>	Italian Alder	lf	r	
<i>Apium nodiflorum</i>	Fool's Water-cress		f	
<i>Arctium minus</i>	Lesser Burdock		r	WP
<i>Arrhenatherum elatius</i>	False Oat-grass	a	f	
<i>Ballota nigra</i>	Black Horehound		lf	
<i>Brachypodium sylvaticum</i>	False-brome		o	WP
<i>Bryonia dioica</i>	White Bryony	o	r	
<i>Callitriche</i> sp.	A water-starwort		lf	
<i>Calystegia sepium</i>	Hedge Bindweed		r	
<i>Carduus crispus</i>	Wetted Thistle	o		
<i>Cirsium arvense</i>	Creeping Thistle	o	r	

Adjacent to Selwyn meadow (continued)

<i>Scientific name</i>	<i>Common name</i>	Abundance		Status
		1998	2005	
<i>Cirsium vulgare</i>	Spear Thistle	o		
<i>Conium maculatum</i>	Hemlock		lf	
<i>Crataegus monogyna</i>	Hawthorn	f	o	WS
<i>Dipsacus fullonum</i>	Wild Teasel	o	r	
<i>Epilobium hirsutum</i>	Great Willowherb		r	
<i>Epilobium parviflorum</i>	Hoary Willowherb		r	
<i>Filipendula ulmaria</i>	Meadowsweet		o	WP
<i>Fraxinus excelsior</i>	Ash	lf	o	WS
<i>Galium aparine</i>	Cleavers		o	
<i>Galium mollugo</i>	Hedge Bedstraw	r	o	
<i>Glechoma hederacea</i>	Ground-ivy		lf	WP
<i>Hedera helix</i>	Ivy	lf	o	WP
<i>Heracleum mantegazzianum</i>	Giant Hogweed		r	
<i>Heracleum sphondylium</i>	Hogweed		o	
<i>Impatiens glandulifera</i>	Indian Balsam		r	
<i>Lamium album</i>	White Dead-nettle		o	
<i>Ligustrum vulgare</i>	Wild Privet	r		WS
<i>Picris echioides</i>	Bristly Oxtongue			
<i>Prunus spinosa</i>	Blackthorn	lf		WS
<i>Rorippa nasturtium-aquaticum</i> agg.	Water-cress		r	
<i>Rosa canina</i> agg.	Dog Rose	o	r	
<i>Rubus fruticosus</i> agg.	Bramble	f	la	WP
<i>Rumex obtusifolius</i>	Broad-leaved Dock		o	
<i>Salix caprea</i>	Goat Willow	r		WS
<i>Sambucus nigra</i>	Elder	o	o	WS
<i>Scrophularia auriculata</i>	Water Figwort		r	
<i>Tussilago farfara</i>	Colt's-foot		o	
<i>Urtica dioica</i>	Common Nettle	f	la-ld	
<i>Veronica beccabunga</i>	Brooklime		o	
<i>Viburnum lantana</i>	Wayfaring-tree		r	WS

End of Herschel Road

<i>Scientific name</i>	<i>Common name</i>	Abundance		Status
		1998	2005	
<i>Acer platanoides</i>	Norway Maple		r	
<i>Acer pseudoplatanus</i>	Sycamore		r	
<i>Anthriscus sylvestris</i>	Cow Parsley		o	
<i>Brachypodium sylvaticum</i>	False-brome		lf	WP
<i>Callitriche</i> sp.	A water-starwort		r	
<i>Crataegus monogyna</i>	Hawthorn		o	WS
<i>Fraxinus excelsior</i>	Ash		o	WS
<i>Geranium robertianum</i>	Herb-Robert		o	WP
<i>Hedera helix</i>	Ivy		a	WP
<i>Rosa canina</i> agg.	Dog Rose		r	
<i>Rubus fruticosus</i> agg.	Bramble		o	WP
<i>Sambucus nigra</i>	Elder		o	WS
<i>Veronica beccabunga</i>	Brooklime		r	

Robinson College

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Brachypodium sylvaticum</i>	False-brome		o	WP
<i>Fraxinus excelsior</i>	Ash		r	WS
<i>Hedera helix</i>	Ivy		ld	WP
<i>Impatiens glandulifera</i>	Indian Balsam		lf	
<i>Sambucus nigra</i>	Elder		r	WS
<i>Ulmus procera</i>	English Elm		r	WP

Cobbett's Corner and Trinity Fellows' Garden

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Acer pseudoplatanus</i>	Sycamore		r	
<i>Alisma plantago-aquatica</i>	Water-plantain	r		
<i>Apium nodiflorum</i>	Fool's Water-cress	o		
<i>Brachypodium sylvaticum</i>	False-brome	o		WP
<i>Callitriche</i> sp.	a water-starwort	f		
<i>Carex otrubae</i>	False Fox-sedge	r		
<i>Dactylis glomerata</i>	Cock's-foot	f		
<i>Filipendula ulmaria</i>	Meadowsweet	lf		WP
<i>Galium mollugo</i>	Hedge Bedstraw	r		
<i>Geranium robertianum</i>	Herb-Robert	o		WP
<i>Geum urbanum</i>	Wood Avens	o		WP
<i>Hedera helix</i>	Ivy		la	WP
<i>Hypericum tetrapterum</i>	Square-stalked St John's-wort	o		
<i>Lycopus europaeus</i>	Gypsywort	o		
<i>Phyllitis scolopendrium</i>	Hart's-tongue		lf	
<i>Ranunculus repens</i>	Creeping Buttercup	o		
<i>Rorippa nasturtium-aquaticum</i> agg.	Water cress	r		
<i>Rubus fruticosus</i> agg.	Bramble	o		WP
<i>Rumex obtusifolius</i>	Broad-leaved Dock	o		
<i>Salix fragilis</i>	Crack Willow	r		
<i>Sambucus nigra</i>	Elder		o	WS
<i>Scrophularia auriculata</i>	Water Figwort	r		
<i>Typha latifolia</i>	Bulrush	r		
<i>Ulmus procera</i>	English Elm		o	WP
<i>Urtica dioica</i>	Common Nettle	f	o	
<i>Veronica beccabunga</i>	Brooklime	lf		

St John's College playing field

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Acer pseudoplatanus</i>	Sycamore		f	
<i>Aegopodium podagraria</i>	Ground-elder		lf	
<i>Brachypodium sylvaticum</i>	False-brome		o-lf	WP
<i>Carex pendula</i>	Pendulous Sedge		r	AW
<i>Crataegus monogyna</i>	Hawthorn		r	WS
<i>Dipsacus fullonum</i>	Wild Teasel		r	
<i>Filipendula ulmaria</i>	Meadowsweet		lf	WP
<i>Hedera helix</i>	Ivy		f	WP

St John's College playing field (continued)

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Impatiens glandulifera</i>	Indian Balsam		o	
<i>Pentaglottis sempervirens</i>	Green Alkanet		o	
<i>Sambucus nigra</i>	Elder	r		WS
<i>Scrophularia auriculata</i>	Water Figwort		o	
<i>Symphoricarpos albus</i>	Snowberry		la	
<i>Tilia x europaea</i>	Lime		r	
<i>Urtica dioica</i>	Common Nettle		o-la	

Alongside Queens' Road

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Carex pendula</i>	Pendulous Sedge		o	AW
<i>Cymbalaria muralis</i>	Ivy-leaved Toadflax		f	
<i>Epilobium hirsutum</i>	Great Willowherb		r	
<i>Epilobium parviflorum</i>	Hoary Willowherb		o	
<i>Geranium robertianum</i>	Herb-Robert		o	WP
<i>Impatiens glandulifera</i>	Indian Balsam		lf	
<i>Lycopus europaeus</i>	Gypsywort		r	
<i>Rumex obtusifolius</i>	Broad-leaved Dock		o	
<i>Scrophularia auriculata</i>	Water Figwort		lf	
<i>Senecio vulgaris</i>	Groundsel		o	
<i>Urtica dioica</i>	Common Nettle		o	

St John's College

Scientific name	Common name	Abundance		Status
		1998	2005	
	filamentous alga		lf	
<i>Acer pseudoplatanus</i>	Sycamore		r	
<i>Lycopus europaeus</i>	Gypsywort		r	

d dominant
a abundant
f frequent
o occasional
r rare
l locally

WP Woodland plant used for determining woodland value
WS Woody species for determining scrub or hedgerow value
AW Ancient woodland indicator species

Botanical scientific nomenclature follows Stace CA (1997) *New Flora of the British Isles* (2nd ed.) CUP.

Fauna, entire site

Scientific name	Common name	Abundance		Status
		1998	2005	
	medium-sized fish		2	
<i>Gallinula chloropus</i>	Moorhen		4	
<i>Leuciscus leuciscus</i>	Dace		p	
<i>Salmo trutta fario</i>	Brown Trout		p	

p present

SITE RECORD SHEET

SITE NAME: Coton Path Hedgerow

Site code: C5.6

Grid ref: TL429587

Date of survey: 19/7/05 & 2/8/05

Surveyor : Steve Hartley

Habitat information

Code	Habitat type
B6	Grassland: poor semi-improved
J2.3.1	Boundaries: hedge with trees, species-rich
J2.6	Boundaries: ditch

Site area:

0.61 ha

Site description

This site is a near continuous hedgerow, approximately 940m long and 4-8m tall for much of this length. It runs on the north side of the Coton footpath, recently converted into a cycleway, west from TL433586 through a dog-leg to TL425586. Work on the cycleway has disturbed the path verges throughout the length of the site, sometimes severely.

Along the eastern length, from the university sports ground to the dog-leg, the hedge grows on both sides of a steep-sided drain. Occasional breaks in the hedge, especially beside bridges, allow stream and wetbank vegetation to grow, including Water-cress and Bittersweet. At its eastern end, opposite the lakes of the sports ground, the hedge has a diverse range of shrubs and trees, including Hawthorn *Crataegus monogyna*, Blackthorn *Prunus spinosa* and a plum *Prunus* sp. To the west of this section until the dog-leg, suckering English Elm *Ulmus procera* is abundant and nears dominance in places; there are frequent dead suckers. The height ranges from 6-8m by the Cavendish Laboratory to 4-6m approaching the dog-leg. Other species include occasional Pedunculate Oak *Quercus robur* trees. Management appears to consist of trimming the lower 2m to keep the path clear. Beneath the hedge and on the other side of the path are narrow rank verges, recently disturbed by the work on the cycleway, with frequent False Oat-grass *Arrhenatherum elatius* and Tall Fescue *Festuca arundinacea*. Forbs tend to be rank, such as Black Horehound *Ballota nigra*, although the grassland indicator species Hoary Ragwort *Senecio erucifolius* is occasional.

South along the dog-leg, a dry narrow ditch runs to the west of the path and verge, and to the west of this ditch runs a line of occasional small whippy shrubs, overshadowed by a plantation behind it. Along this verge and ditch, two Nationally Scarce species, Slender Tare *Vicia parviflora* and Yellow Vetchling *Lathyrus aphaca*, have been recently recorded,

but at the time of the survey little vegetation had survived the cyclepath work. East of the path there is frequent Bramble *Rubus fruticosus* agg.

West from the dog-leg the northern verge of the path is wide, and Yellow Vetchling has been recorded here also. Four years ago the ditch beyond the verge was redug and the hedge on the other side planted. The ditch is dry at its eastern end but becomes wetter to the west. The hedge is moderately diverse, with Hawthorn, Blackthorn, Field Maple *Acer campestre* and Hazel *Coryllus avellana*.

Site assessment

This site qualifies as a County Wildlife Site because it supports populations of two Nationally Scarce vascular plant species (County WS criterion 6a). It qualifies as a City Wildlife Site under the hedgerow criterion (City WS criterion 2.9).

SPECIES LISTS

Hedgerow shrubs and trees

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Acer campestre</i>	Field Maple	o	o-lf	WS
<i>Aesculus hippocastanum</i>	Horse-chestnut	r	o	
<i>Alnus glutinosa</i>	Alder		r	WP
<i>Cornus sanguinea</i>	Dogwood		r	WS
<i>Coryllus avellana</i>	Hazel		lf	WS
<i>Crataegus monogyna</i>	Hawthorn	o	o-lf	WS
<i>Fraxinus excelsior</i>	Ash	r	o	WS
<i>Hedera helix</i>	Ivy	f	o	WP
<i>Ligustrum vulgare</i>	Wild Privet	r	o	WS
<i>Prunus sp.</i>	a plum		r	
<i>Prunus spinosa</i>	Blackthorn		o	WS
<i>Quercus robur</i>	Pedunculate Oak	o	o	WS
<i>Rosa canina</i> agg.	Dog Rose	o	r	
<i>Rubus caesius</i>	Dewberry		r	WP
<i>Rubus fruticosus</i> agg.	Bramble	f	o-lf	WP
<i>Salix caprea</i>	Goat Willow	r		WS
<i>Sambucus nigra</i>	Elder	o	o	WS
<i>Taxus baccata</i>	Yew	r	r	
<i>Ulmus procera</i>	English Elm	f	f-la	WP
<i>Viburnum opulus</i>	Guelder-rose		r	WS

Ground flora and verges

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Achillea millefolium</i>	Yarrow	o	lf	
<i>Anisantha sterilis</i>	Barren Brome	o		
<i>Anthriscus sylvestris</i>	Cow Parsley	o	o	
<i>Arctium minus</i>	Lesser Burdock		o	WP
<i>Arrhenatherum elatius</i>	False Oat-grass	a	f	
<i>Artemisia vulgaris</i>	Mugwort		r	
<i>Ballota nigra</i>	Black Horehound	o	o	

Ground flora and verges (continued)

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Bryonia dioica</i>	White Bryony	o	o	
<i>Calystegia sepium</i>	Hedge Bindweed		o	
<i>Chamerion angustifolium</i>	Rosebay Willowherb	r	r	
<i>Cirsium arvense</i>	Creeping Thistle		o	
<i>Cirsium vulgare</i>	Spear Thistle	o	o-lf	
<i>Convolvulus arvensis</i>	Field Bindweed		lf	
<i>Crepis capillaris</i>	Smooth Hawk's-beard	o		
<i>Dactylis glomerata</i>	Cock's-foot	f	o	
<i>Elytrigia repens</i>	Common Couch		o	
<i>Epilobium hirsutum</i>	Great Willowherb	o	o	
<i>Equisetum sp.</i>	a horsetail	o		
<i>Equisetum arvense</i>	Field Horsetail		o	
<i>Festuca arundinacea</i>	Tall Fescue		f	
<i>Festuca rubra</i> agg.	Red Fescue		o	
<i>Galium aparine</i>	Cleavers	o		
<i>Geranium dissectum</i>	Cut-leaved Crane's-bill		r	
<i>Geranium molle</i>	Dove's-foot Crane's-bill		r	
<i>Geranium robertianum</i>	Herb-Robert	o		WP
<i>Glechoma hederacea</i>	Ground-ivy	o		WP
<i>Hedera helix</i>	Ivy		o	WP
<i>Heracleum sphondylium</i>	Hogweed	o	o	
<i>Hordeum secalinum</i>	Meadow Barley	o		NG
<i>Lactuca sp.</i>	a lettuce		o	
<i>Lamium album</i>	White Dead-nettle	o	r	
<i>Lathyrus aphaca</i>	Yellow Vetchling	r	o ¹	NS
<i>Lolium perenne</i>	Perennial Rye-grass	o		
<i>Malva sylvestris</i>	Common Mallow	o	o	
<i>Medicago arabica</i>	Spotted Medick	r		
<i>Monarda citriodora</i>	Lemon Beebalm		r	
<i>Papaver dubium dubium</i>	Long-headed Poppy	o		
<i>Picris echioides</i>	Bristly Oxtongue	o	f	
<i>Plantago lanceolata</i>	R wort Plantain	o	o	
<i>Poa sp.</i>	a meadow-grass	o		
<i>Potentilla reptans</i>	Creeping Cinquefoil	f	o	
<i>Rumex crispus</i>	Curled Dock	r		
<i>Rumex obtusifolius</i>	Broad-leaved Dock	o	o	
<i>Senecio erucifolius</i>	Hoary Ragwort		o	NG/CG
<i>Senecio jacobaea</i>	Common Ragwort		o	
<i>Silene vulgaris</i>	Bladder Campion		r	CG
<i>Sison amomum</i>	Stone Parsley		o	
<i>Sisymbrium officinale</i>	Hedge Mustard	o		
<i>Torilis japonica</i>	Upright Hedge-parsley		o	
<i>Tragopogon pratensis</i>	Goat's-beard	r		
<i>Tripleurospermum inodorum</i>	Scentless Mayweed		r	
<i>Urtica dioica</i>	Common Nettle	o	o	
<i>Vicia parviflora</i>	Slender Tare		o ²	NS

1 Recorded earlier in 2005 by Jonathan Shanklin, Cambridge Natural History Society

2 Recorded flowering in 2003 by Cambridge Natural History Society

Open ditch vegetation

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Epilobium hirsutum</i>	Great Willowherb		o	
<i>Epilobium montanum</i>	Broad-leaved Willowherb	o		WP
<i>Equisetum</i> sp.	a horsetail	f		
<i>Iris pseudacorus</i>	Yellow Iris		o	
<i>Lythrum salicaria</i>	Purple-loosestrife		o	
<i>Rorippa nasturtium-aquaticum</i> agg.	Water-cress	o	lf	
<i>Solanum dulcamara</i>	Bittersweet	f	f	

a	abundant
f	frequent
o	occasional
r	rare
l	locally

NG	Weak indicator species, neutral grassland
CG	Weak indicator species, calcareous grassland
NG/CG	Weak indicator species, neutral and calcareous grassland
NG*	Strong indicator species, neutral grassland
CG*	Strong indicator species, calcareous grassland
NG*/CG*	Strong indicator species, neutral and calcareous grassland

WP	Woodland plant used for determining woodland value
WS	Woody species for determining scrub or hedgerow value

NS	Nationally Scarce
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Botanical scientific nomenclature follows Stace CA (1997) *New Flora of the British Isles* (2nd ed.) CUP.

Vertebrate Fauna

Scientific name	Common name	Abundance	
		1998	2005
<i>Acrocephalus schoenobaenus</i>	Sedge Warbler	p	
<i>Delichon urbica</i>	House Martin		4
<i>Falco subbuteo</i>	Hobby	p	
<i>Oryctolagus cuniculus</i>	Rabbit		p
<i>Passer domesticus</i>	House Sparrow	p	
<i>Sorex araneus</i>	Common Shrew	p	
<i>Streptopelia turtur</i>	Turtle Dove	p	
<i>Sylvia atricapilla</i>	Blackcap	p	
<i>Sylvia curruca</i>	Lesser Whitethroat	p	
<i>Turdus merula</i>	Blackbird	p	

Invertebrate Fauna

Scientific name	Common name	Abundance	
		1998	2005
<i>Adalia decempunctata</i>	Ten-spot Ladybird	p	
<i>Aeshna grandis</i>	Brown Hawker		1
<i>Metrioptera roeselii</i>	Roesel's Bush-cricket		2
<i>Polygonia c-album</i>	Comma		1
<i>Pyronia tithonus</i>	Gatekeeper		7

p	present
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SITE RECORD SHEET

SITE NAME: Hedgerows east of M11
Site code: C5.3 (includes C5.4 and C5.5)
Grid ref: TL421583
Date of survey: 01/09/05
Surveyor: Emma Ogden

Habitat information

Code	Habitat type
B22	Grassland: neutral, semi-improved
J11	Cultivated/disturbed land: arable
J21	Boundaries, intact hedge
J23	Boundaries, hedge with trees
J262	Boundaries, seasonally wet ditch

Site area

0.56 ha

Site description

This hedgerow and verge site comprises two arms: the north-eastern arm formerly known as 'Wet Ditch and Bank' and the western and southern arm formerly known as 'Hedge (Spurge Laurel)' and 'Edwin's Ditch'.

The north-eastern hedgerow is about 4 metres tall and 6 metres wide. It lies on the northern bank of a dry ditch and, for much of its length, overhangs it. The field to the north is pastureland and to the south is an arable field. The hedgerow is largely composed of Hawthorn *Crataegus monogyna* and has frequent Dog Rose *Rosa canina* agg. On the southern side of the ditch is a grassy verge generally about 1m wide but in places up to 4.5m wide. The previous survey recorded coarse mesotrophic grassland with frequent forb species including several grassland indicator species such as frequent Black Knapweed *Centaurea nigra* and Meadow Vetchling *Lathyrus pratensis*. However these species were not seen in the current survey. There is some scrub, mainly Hawthorn and Dog Rose, colonising this area from the hedgerow.

The southern and western arm of the site is a tall mature hedgerow beside a grassy verge which is part of a public footpath. For the purposes of description this arm can be divided into three sections: a western section (from the corner at TL42155826 running north then west to TL42055845), a central section (running more or less straight from the corner at TL42155826 east to the footbridge at TL42605816) and an eastern section (running from

the footbridge at TL42605816 east to TL42745816). The majority of this arm lies adjacent to arable fields.

The western section is a broad hedgerow about 4-5m wide and varies from 4-8m tall with several standard trees. The hedge is composed mainly of Blackthorn and Hawthorn but contains a large number of other woody species including, Elm *Ulmus* sp, Dogwood *Cornus sanguinea*, occasional Wayfaring Tree *Viburnum lantana*, Wild Privet *Ligustrum vulgare* and Horse Chestnut *Aesculus hippocastanum*. The adjacent narrow verge is dominated by coarse mesotrophic grasses including Perennial Rye grass *Lolium perenne*, Cocks Foot *Dactylis glomerata*, False-oat Grass *Arrhenatherum elatius*, Barren Brome *Anisantha sterilis*, Couch grass *Agropyrum repens*, Nettle and closer to the arable crop species such as Round-leaved Fluellen *Kickxia spuria* and Rosebay Willowherb *Chamerion angustifolium*.

The central section is a somewhat narrower (2m wide x 4m high) hedgerow running along a dry ditch with an adjacent grassy verge. The principal species are Hawthorn, Dog Rose and Bramble but species such as Wild Privet, Field Maple *Acer campestre* and Blackthorn *Prunus spinosa* are also present. The adjacent grassy verge, generally 2-3m wide (on the southern side) and 1-2m wide (on northern side) is mown occasionally. Dominated by coarse mesotrophic grasses such as False-oat Grass, Perennial Rye Grass and Cock's Foot it also supports a range of common grassland forbs including a few grassland indicator species at low frequency. The county rarity Cypress Spurge *Euphorbia cyparissias* is present in small quantity; this species has also been previously recorded along the north-eastern arm of the site.

The eastern section is a mature hedgerow 4-5m tall, 5m wide and dominated by English Elm *Ulmus procera* with frequent Hawthorn. Other species include Ash, Wild Privet, Blackthorn and Field Maple. The adjacent verge is dominated by coarse mesotrophic grasses such as False-oat grass, Rough Meadow Grass *Poa trivialis*, Barren Brome and Meadow Brome. Forb species include the grassland indicator species Black Knapweed and Greater Knapweed *Centaurea scabiosa*, both at low frequency.

Part of the site lies outside the City Council boundary.

To the north-west of the site is an area of scrub-woodland (approximately 10m wide) forming the boundary to an improved grassland field. This scrubby area contains mature Ash trees mixed in with abundant Bramble and occasional Blackthorn, Hawthorn, Elder and a field layer of dominant Nettle, Bindweed and locally abundant Spear Thistle. This boundary continues into the next (southern) field but contains no trees; species present include Hawthorn, Blackthorn and Bramble in a hedgerow approximately 5m tall by 3m wide. This boundary is proposed as an extension to the City Wildlife Site.

Site assessment

This site qualifies as a County Wildlife Site because it supports populations of Nationally Scarce vascular plant species (*Torilis arvensis*) and a vascular plant species, which is rare in the county (*Euphorbia cyparissias*). Additionally, the site qualifies as a City Wildlife Site under the hedgerow criterion (2.9) and for neutral grassland (criterion 2.10c).

SPECIES LISTS

North-eastern arm, hedgerow

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Crataegus monogyna</i>	Hawthorn	a	a	WS
<i>Fraxinus excelsior</i>	Ash	r	o	WS
<i>Prunus spinosa</i>	Blackthorn	o	o	WS
<i>Rosa canina</i> agg.	Dog Rose	f	f	
<i>Rubus fruticosus</i> agg.	Bramble	o	lf	WP

North-eastern arm, verge

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Agrimonia eupatoria</i>	Agrimony	o	r	NG/CG
<i>Allium vineale</i>	Wild Onion	f	-	
<i>Alopecurus myosuroides</i>	Black-grass	o	o	
<i>Anisantha sterilis</i>	Barren Brome	f	f	
<i>Arrhenatherum elatius</i>	False Oat-grass	a	a	
<i>Artemisia vulgaris</i>	Mugwort	o	o	
<i>Bromus hordeaceus</i> ssp. <i>hordeaceus</i>	a soft-brome	a	a	
<i>Centaurea nigra</i>	Common Knapweed	f	o	NG/CG
<i>Chaerophyllum temulum</i>	Rough Chervil	-	o	
<i>Convolvulus arvensis</i>	Field Bindweed	o	o	
<i>Crataegus monogyna</i>	Hawthorn	a	a	
<i>Dactylis glomerata</i>	Cock's-foot	ol	o	
<i>Daucus carota</i> ssp. <i>carota</i>	Wild Carrot	o	r	
<i>Dipsacus fullonum</i> sens. lat.	Wild Teasel	o	o	
<i>Epilobium hirsutum</i>	Great Willowherb	o	o	
<i>Erysimum cheiranthoides</i>	Treacle Mustard	f	-	
<i>Euphorbia cyparissias</i>	Cypress Spurge	f	o	County Rare
<i>Fraxinus excelsior</i>	Ash	r	o	WS
<i>Geranium molle</i>	Dove's-foot Crane's-bill	o	o	
<i>Heracleum sphondylium</i>	Hogweed	f	f	
<i>Kickxia spuria</i>	Round-leaved Fluellen	o	o	
<i>Knautia arvensis</i>	Field Scabious	r	r	NG*/CG*
<i>Lathyrus pratensis</i>	Meadow Vetchling	f	f	NG
<i>Leucanthemum vulgare</i>	Oxeye Daisy	o	-	NG/CG
<i>Lotus corniculatus</i>	Common Bird's-foot-trefoil	o	-	NG/CG
<i>Medicago lupulina</i>	Black Medick	o	-	
<i>Myosotis arvensis</i>	Field Forget-me-not	o	o	
<i>Odontites vernus</i>	Red Bartsia	o	o	
<i>Pastinaca sativa</i>	Wild Parsnip	f	o	CG
<i>Phleum bertolonii</i>	Small leaved Timothy	-	lf	
<i>Picris echioides</i>	Bristly Oxtongue	o	o	
<i>Potentilla reptans</i>	Creeping Cinquefoil	o	o	
<i>Prunus spinosa</i>	Blackthorn	o	o	WS
<i>Rosa canina</i> agg.	Dog Rose	f	f	
<i>Rubus fruticosus</i> agg.	Bramble	o	o	WP

North-eastern arm, verge (continued)

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Senecio jacobea</i>	Common Ragwort	-	0	
<i>Sonchus sp.</i>	a sow-thistle	0	0	
<i>Torilis arvensis</i>	Spreading Hedge-parsley	f	0	Nationally Scarce
<i>Trifolium pratense</i>	Red Clover	r	r	
<i>Trisetum flavescens</i>	Yellow Oat-grass	r	r	NG
<i>Tussilago farfara</i>	Colt's-foot	0	0	
<i>Vicia parviflora</i>	Slender Tare	f	-	Nationally Scarce

Southern arm, western section, hedgerow

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Acer campestre</i>	Field Maple	0	0	WS
<i>Aesculus hippocastanum</i>	Horse-chestnut	r	r	
<i>Cornus sanguinea</i>	Dogwood	0	0	WS
<i>Crataegus monogyna</i>	Hawthorn	f	f	WS
<i>Fraxinus excelsior</i>	Ash	0	0	WS
<i>Hedera helix</i>	Ivy	0	0	WP
<i>Ligustrum vulgare</i>	Wild Privet	0	0	WS
<i>Populus nigra 'Italica'</i>	Lombardy-poplar	r	r	
<i>Prunus spinosa</i>	Blackthorn	f	f	WS
<i>Rosa canina agg.</i>	Dog Rose	0	0	
<i>Rubus fruticosus agg.</i>	Bramble	f	f	WP
<i>Ulmus procera</i>	English Elm	0	0	WP
<i>Viburnum lantana</i>	Wayfaring-tree	0	0	WS

Southern arm, western section, verge

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Allium vineale</i>	Wild Onion	r	-	
<i>Arrhenatherum elatius</i>	False Oat-grass	a	a	
<i>Calystegia sepium ssp. sepium</i>	Great Bindweed	0	-	
<i>Centaurea nigra</i>	Common Knapweed	r	-	NG/CG
<i>Cirsium vulgare</i>	Spear Thistle	0	0	
<i>Dactylis glomerata</i>	Cock's-foot	a	a	
<i>Daphne laureola</i>	Spurge-laurel	r	r	WP
<i>Dipsacus fullonum sens. lat.</i>	Wild Teasel	r	r	
<i>Elytrigia repens</i>	Common Couch	0	0	
<i>Epilobium hirsutum</i>	Great Willowherb	0	0	
<i>Galium aparine</i>	Cleavers	0	0	
<i>Heracleum sphondylium</i>	Hogweed	0	0	
<i>Lolium perenne</i>	Perennial Rye-grass	a	a	
<i>Myosotis arvensis</i>	Field Forget-me-not	r	r	
<i>Phleum pratense sens.str.</i>	Timothy	0	0	
<i>Poa sp.</i>	a meadow-grass	f	f	
<i>Sonchus oleraceus</i>	Smooth Sow-thistle	0	0	
<i>Stachys sylvatica</i>	Hedge Woundwort	r	r	WP
<i>Tamus communis</i>	Black Bryony	0	0	WP
<i>Tragopogon pratensis</i>	Goat's-beard	0	-	

Southern arm, central section, hedgerow

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Acer campestre</i>	Field Maple	o	o	WS
<i>Crataegus monogyna</i>	Hawthorn	f	f	WS
<i>Fraxinus excelsior</i>	Ash	-	o	WS
<i>Ligustrum vulgare</i>	Wild Privet	r	-	WS
<i>Prunus spinosa</i>	Blackthorn	o	o	WS
<i>Rosa canina</i> agg.	Dog Rose	f	f	
<i>Rubus fruticosus</i> agg.	Bramble	f	f	WP
<i>Sambucus nigra</i>	Elder	r	r	WS

Southern arm, central section, verge

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Achillea millefolium</i>	Yarrow	-	o	
<i>Agrimonia eupatoria</i>	Agrimony	-	-	NG/CG
<i>Agrostis stolonifera</i>	Creeping Bent	o	o	
<i>Allium vineale</i>	Wild Onion	o	-	
<i>Arrhenatherum elatius</i>	False Oat-grass	-	a	
<i>Bromus commutatus</i>	Meadow Brome	-	a	NG*
<i>Bryonia dioica</i>	White Bryony	o	o	
<i>Calystegia sepium</i> ssp. <i>sepium</i>	Great Bindweed	o	o	
<i>Centaurea nigra</i>	Common Knapweed	o	o	NG/CG
<i>Cirsium arvense</i>	Creeping Thistle	o	o	
<i>Crepis vesicaria</i>	Beaked Hawk's-beard	o	-	
<i>Dactylis glomerata</i>	Cock's-foot	f	f	
<i>Daphne laureola</i>	Spurge Laurel	-	r	
<i>Daucus carota</i> ssp. <i>carota</i>	Wild Carrot	-	-	
<i>Epilobium hirsutum</i>	Great Willowherb	f		
<i>Euphorbia cyparissias</i>	Cypress Spurge	r	f	County Rare
<i>Galium verum</i>	Lady's Bedstraw	o	-	NG/CG
<i>Heracleum sphondylium</i>	Hogweed	o	o	
<i>Lathyrus pratensis</i>	Meadow Vetchling	r	r	NG
<i>Lolium perenne</i>	Perennial Rye-grass	f	f	
<i>Odontites vernus</i>	Red Bartsia	o	o	
<i>Pastinaca sativa</i>	Wild Parsnip	o	o	CG
<i>Phleum pratense</i> sens.str.	Timothy	o	o	
<i>Picris echioides</i>	Bristly Oxtongue	f	f	
<i>Plantago lanceolata</i>	R wort Plantain	o	o	
<i>Plantago major</i>	Greater Plantain	o	o	
<i>Poa</i> sp.	a meadow-grass	f	f	
<i>Pulicaria dysenterica</i>	Fleabane	o	r	
<i>Ranunculus repens</i>	Creeping Buttercup	o	o	
<i>Solanum dulcamara</i>	Bittersweet	o	o	
<i>Stachys sylvatica</i>	Hedge Woundwort	r	o	WP
<i>Tussilago farfara</i>	Coltsfoot	o	lf	
<i>Urtica dioica</i>	Common Nettle	o	o	
<i>Veronica persica</i>	Common Field-speedwell	r	o	

Southern arm, eastern section, hedgerow

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Acer campestre</i>	Field Maple	o	o	WS
<i>Crataegus monogyna</i>	Hawthorn	f	f	WS
<i>Fraxinus excelsior</i>	Ash	o	o	WS
<i>Ligustrum vulgare</i>	Wild Privet	r	r	WS
<i>Prunus spinosa</i>	Blackthorn	o	o	WS
<i>Rosa canina</i> agg.	Dog Rose	o	o	
<i>Rubus fruticosus</i> agg.	Bramble	o	o	WP
<i>Ulmus procera</i>	English Elm	f	f	WP

Southern arm, eastern section, verge

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Alliaria petiolata</i>	Garlic Mustard	r	-	WP
<i>Allium vineale</i>	Wild Onion	r	-	
<i>Anisantha sterilis</i>	Barren Brome	f	f	
<i>Anthriscus sylvestris</i>	Cow Parsley	f	-	
<i>Arrhenatherum elatius</i>	False Oat-grass	a	a	
<i>Barbarea vulgaris</i>	Winter-cress	r	-	
<i>Brachypodium sylvaticum</i>	False-brome	r	r	WP
<i>Bromus commutatus</i>	Meadow Brome	f	f	NG*
<i>Bryonia dioica</i>	White Bryony	o	o	
<i>Calystegia sepium</i> ssp. <i>sepium</i>	Great Bindweed	f	f	
<i>Carduus crispus</i>	Wetted Thistle	o	o	
<i>Centaurea nigra</i>	Common Knapweed	o	o	NG/CG
<i>Centaurea scabiosa</i>	Greater Knapweed	r	r	CG*
<i>Cirsium arvense</i>	Creeping Thistle	o	o	
<i>Convolvulus arvensis</i>	Field Bindweed	f	f	
<i>Elytrigia repens</i>	Common Couch	o	o	
<i>Galium aparine</i>	Cleavers	f	f	
<i>Galium mollugo</i>	Hedge Bedstraw	r	r	
<i>Geranium robertianum</i>	Herb-robert	o	o	WP
<i>Heracleum sphondylium</i>	Hogweed	o	o	
<i>Lamium album</i>	White Dead-nettle	o	o	
<i>Myosotis arvensis</i>	Field Forget-me-not	r	r	
<i>Odontites vernus</i>	Red Bartsia	r	-	
<i>Poa trivialis</i>	Rough Meadow-grass	a	a	
<i>Ranunculus repens</i>	Creeping Buttercup	f	f	
<i>Rumex obtusifolius</i>	Broad-leaved Dock	o	o	
<i>Stachys sylvatica</i>	Hedge Woundwort	o	o	WP
<i>Tamus communis</i>	Black Bryony	o	o	WP
<i>Urtica dioica</i>	Common Nettle	f	f	

Proposed extension – far north-west hedgerow

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Cirsium arvense</i>	Creeping Thistle	-	f	
<i>Cirsium vulgare</i>	Spear Thistle	-	a	
<i>Convolvulus arvensis</i>	Field Bindweed	-	f	
<i>Crataegus monogyna</i>	Hawthorn	-	lf	WS
<i>Fraxinus excelsior</i>	Ash	-	lf	WS
<i>Prunus spinosa</i>	Blackthorn	-	o	WS
<i>Rubus fruticosus</i>	Bramble	-	a	WP
<i>Urtica dioica</i>	Nettle	-	d	

Fauna, entire site

Scientific name	Common name	Abundance		Status
		1998	2005	
<i>Agapanthia villosa</i>	a longhorn beetle	p	-	Local
<i>Alauda arvensis</i>	Skylark	p	-	
<i>Aphantopus hyperantus</i>	Ringlet	p	-	
<i>Emberiza citrinella</i>	Yellowhammer	p	-	
<i>Euthrix potatoria</i>	Drinker	Larva	-	
<i>Leptophyes punctatissima</i>	Speckled Bush Cricket	p	-	
<i>Ochlodes venata faunus</i>	Large Skipper	p	-	
<i>Phylloscopus trochilus</i>	Willow Warbler	p	-	
<i>Thymelicus sylvestris</i>	Small Skipper	p	-	

a	abundant
f	frequent
o	occasional
r	rare
l	locally
p	present

NG	Neutral grassland indicator species
NG/CG	Neutral and calcareous grassland indicator species
CG	Calcareous grassland indicator species
NG*	Strong neutral grassland indicator species
NG/CG*	Strong neutral and calcareous grassland indicator species
CG*	Strong calcareous grassland indicator species

WP	Woodland plant used for determining woodland value
WS	Woody species for determining scrub or hedgerow value

Botanical scientific nomenclature follows Stace CA (1997) *New Flora of the British Isles*, (2nd ed.) CUP.

The invertebrate statuses are derived from the species dictionary of the RECORDER biological recording database.

Appendix 5

Tetrad/Site: T645 I

4257
Eig. 118, 622570431
Import Qland 62285251-51
Germus 5810 1100 4248 5769
Egulus 5810 1100 4256 5769
Bermus 101 1100 4256 5769
Ug 11819 4255 5769

4357
Kilby 5810 1100 4256 5769
Lough 5810 1100 4256 5769
Lough 5810 1100 4256 5769
Lough 5810 1100 4256 5769

Appendix 6



Scale@A1:
1:5,000
0m 100m 200m

