Cambridge Biomedical Campus

3·4
CBC Preliminary Ecological Appraisal

December 2022

Ecus

Cambridge Biomedical Campus Preliminary Ecological Appraisal and Baseline Biodiversity Assessment

Hydrock

Report prepared by:
Ecus Ltd.
Technology House, 151 Silbury Boulevard, Milton Keynes, MK9 1LH
01256 224588

V2.0, November 2022

Ecus Ltd

Report to:	Hydrock
Report Title:	Cambridge Biomedical Campus Preliminary Ecological Appraisal Report
Version:	V2.0
Issue Date:	November 2022
Report Ref:	19132
Originated By:	Isabel Soane Assistant Ecologist Date: 10 August 2022
Reviewed By:	Claire Evans Consultant Ecologist Date: 30 August 2022
Approved By:	Hannah Broughton Regional Manager Date: 01 September 2022

Version	Author	Description	Date
0.1	Isabel Soane	First draft	10/08/2022
0.2	Claire Evans	QA1	30/08/2022
0.3	Isabel Soane	Amendments following technical review	01/09/2022
0.4	Hannah Broughton	Approver review	01/09/2022
0.5	Isabel Soane	Amendments following approver review	02/09/2022
1.0	**Hannah Broughton**	**Issued to client**	**02/09/2022**
2.0	**Hannah Broughton**	**Addressing of comments**	**28/11/2022**

Contents

Summary

Ecus Limited (Ecus) was commissioned by Hydrock to undertake a Preliminary Ecological Appraisal (PEA) and baseline biodiversity assessment at Cambridge Biomedical Campus, CB2 0SL, along with greenfield land to the south located between National Grid Reference (NGR) TL 46114 55494 to TL 46837 53791, hereafter referred to as "the Site" (Figures 1 & 2). The project is currently at the masterplanning stage and a planning application is not anticipated for several years.

The PEA identified a number of ecological constraints to the proposed works requiring the following recommendations:

- Retention, protection and enhancement of designated sites and Habitats of Principal Importance, including an Environmental Management Plan.
- SSSI impact assessment and consultation with Natural England due to the location of Gog Magog Golf Course and Cherry Hinton Pits SSSIs within 2 km of the Site boundary.
- A hedgerow assessment is recommended to establish which hedgerows on the Site are protected under the Hedgerows Regulations 1997.
- The habitats on Site are suitable for badger dispersal, feeding and sett creation. In addition a badger sett was identified on the Site. Further badger surveys are recommended.
- There are bat roost records on the border of the Site and bat roost potential in the buildings and mature trees. A bat activity transect should be undertaken along hedgerows and the green corridor leading to Nine Wells LNR once a month from April to October to determine the usage of the site by bats. One of these surveys should be a dusk and dawn within 24 hours. Remote static bat detectors should also be deployed. In addition a preliminary bat roost assessment (PBRA) should be undertaken on any buildings which are to be refurbished or demolished. Trees which are to be felled may also require further assessment.
- Due to recent records and suitability of habitat on Site for GCN, a district level licence should be considered. Alternatively, conventional survey methods would be required.
- It is recommended that reptile surveys are undertaken to inform the EcIA and future planning application. They would include presence/absence surveys and if these prove to show numbers of reptiles on the Site, population densities should be surveyed for.
- Breeding and wintering bird surveys have been undertaken by others. It is recommended that these are kept up to date to inform the EcIA and future planning application.
- The habitat suitability of the Site for otter and water vole requires further assessment during wetter times of the year;
- Several enhancement opportunities have also been identified.

The Biodiversity Metric 3.1 (Natural England, 2022) calculated the baseline biodiversity value of the Site as 268.55 Habitat Units, 43.49 Hedgerow Units and 4.64 River Units.

At this early stage of the project, prior to surveys and the EcIA, avoidance, mitigation and compensation cannot be designed however principles have been put forward to assist the masterplan. Based on the results of the preliminary appraisal, it should be possible to design a sustainable development that meets the need and also protects and enhances biodiversity.

1. Introduction

1.1 Scope of this report

1.1.1 Ecus Limited (Ecus) was commissioned by Hydrock to complete a Preliminary Ecological Appraisal (PEA) and baseline biodiversity assessment (Chartered Institute of Ecology and Environmental Management (CIEEM), 2017) at Cambridge Biomedical Campus, Cambridge, Cambridgeshire, located between National Grid Reference (NGR) TL 46114 55494 and TL 46837 53791.

1.1.2 This report details the findings of a data consultation, habitat survey and protected species assessment carried out on 26th July 2022. The report also details the results of the Biodiversity Net Gain (BNG) baseline assessment using biodiversity metric calculations. The methodologies employed and all survey findings are described along with a preliminary evaluation and assessment of the ecological importance of the Site. Any requirement for further survey work and/or mitigation/enhancement is also detailed as required.

1.1.3 This report is not suitable for a planning application; an Ecological Impact Assessment (EcIA) will be required.

1.1.4 The PEA focussed on the structures and the habitats that are likely to be directly impacted by the works, hereafter referred to as 'the Site'. The Site is defined by the red line 'Site boundary' in Figure 1, as drawn by Ecus based on the document 'Masterplan Redline' provided by Hydrock. The PEA also surveyed the surrounding habitats to the Site, which may be indirectly impacted by the works, hereafter referred to as 'the Survey Area'. The Survey Area is defined by the blue line 'Survey Area boundary' in Figure 1.

1.2 Site description

1.2.1 The Site is located approximately 2.5 km south of Cambridge City centre, between TL 46114 55494 and TL 46837 53791. The Site extent can be viewed in Figure 1. The habitat map is illustrated in Figure 2a and Figure 2b, and the Site photographs can be viewed in Appendix 1.

1.2.2 The Site was approximately 1.8 km in length and 1.2 km at its widest point. Where access and visibility allowed, a 30 m buffer around the Site was also included within the Survey Area.

1.2.3 The south of the Site lies in a semi-rural area, with arable fields to the east and pockets of wooded areas to the south. There is a railway running down the western edge with the town of Trumpington beyond, and the town of Great Shefford is directly south. The nearest water course is the Hobson's Brook to the north west of the Site, which feeds into Nine Wells Local Nature Reserve on the western border and is connected to the River Cam.

1.3 Project scope

1.3.1 The proposed works at the Site will consist of building development however the extent is not yet known as the project is at the masterplanning stage. This PEA and BNG calculations will be used to aid decision making.

1.3.2 Works are proposed to include but may not be limited to residential buildings, campus buildings, associated roads and pathways.

1.3.3 Works do not have a date of commencement.

1.4 Quality assurance

1.4.1 The habitat survey and protected species assessment, and the associated PEA report was completed by Assistant Ecologists Molly-Marie Mills BSc (Hons) MSc and Isabel Soane BSc (Hons) MSc.

1.4.2 Consultant ecologist Claire Evans BSc (Hons) MSc has reviewed this report in accordance with Ecus' Quality Assurance policy.

1.4.3 The report was approved by Regional Manager Hannah Broughton BSc (Hons) MCIEEM.

2. Legislation

2.1.1 The primary purpose of the PEA was to identify any ecological constraints to the proposed works, including designated sites, habitats and species protected by legislation, namely, but not limited to:

- The Wildlife & Countryside Act 1981 (as amended) ("the WCA 1981");
- The Conservation of Habitats and Species Regulations 2017 (as amended) ("the Habitats Regulations");
- The Protection of Badgers Act 1992;
- The Natural Environment and Rural Communities Act 2006 ("the NERC Act"); and
- The Environment Act 2021.

2.1.2 Further details for species protected by the above legislation are provided in Appendix 2.

3. Methodology

3.1 Data consultation

3.1.1 Obtaining existing biological records is an important part of the PEA process, as it provides additional information that may not be apparent during a Site visit, and provides a helpful baseline from which to inform recommendations and mitigation.

3.1.2 The Cambridgeshire and Peterborough Environmental Records Centre (CPERC) was approached for data consultation in July 2022, to provide recent (within the past 10 years) biological records within 2 km of the Site.

3.1.3 The data obtained from CPERC includes records of protected and notable species, invasive non-native species (INNS) and non-statutory designated sites for nature conservation.

3.1.4 In addition, Ecus used the Multi-Agency Geographical Information for the Countryside (MAGIC) website (MAGIC, 2022) to identify statutory designated sites of international and European nature conservation importance within 10 km of the Site, other statutory designated sites within 2 km of the Site (Figure 3) and any records of European Protected Species (EPS) mitigation licences granted within 2 km of the Site.

3.1.5 Information obtained from MAGIC and CPERC is included within the report where appropriate.

3.2 Site survey

3.2.1 A habitat survey and protected species assessment was completed in accordance with industry guidelines (CIEEM, 2017 & Butcher *et al*., 2020) on 26th July 2022.

3.2.2 Weather conditions and visibility were considered to be suitable for the purpose of the survey (temperature = 17-19 °C, wind = Beaufort 2, cloud = 90% cover, precipitation = none).

3.2.3 The surveyors surveyed the Survey Area as shown by the blue line on Figure 1. Botanical species were recorded by level of abundance using the DAFOR method and a preliminary species list was compiled. This method is intended to provide an indication of the relative abundances of plant species within each habitat. The standardised terms are as follows:

- D – Dominant
- A – Abundant
- F – Frequent
- O – Occasional
- R – Rare

3.2.4 Habitat type was categorised using the UKHab methodology and condition was assessed according to the Biodiversity Metric 3.1 (Natural England, 2022), where applicable.

3.2.5 The Minimum Mappable Unit was used, which was 25m^2 for areas and 5m length x 1m width for linear features. Secondary codes were utilised focussing on habitat features and land use. Under UKHab guidance, this Minimum Mappable Unit requires the mapping of linear features as polygons if they are wider than 1m. This does not translate effectively into the Biodiversity Metric, which requires linear features to be inputted as lengths (km). As such, some of the polygon area features have required manual conversion into lengths for the purposes of the biodiversity baseline.

3.2.6 This survey method aims to characterise habitats and communities present and is not intended to provide a complete list of all plants occurring across the Survey Area.

3.2.7 Evidence of protected species, species of nature conservation importance, and notable, rare, or scarce species was recorded if field signs were present at the time of survey. Any evidence recorded is included within the report as appropriate and represented as Targets Notes (TN) in Figure 2. Photographs were taken of each habitat type and any features with potential to support protected or notable species.

3.2.8 Habitat type has been digitised using QGIS, 2022, see Figure 2a and Figure 2b.

3.2.9 Any habitats present which are listed under Section 41 of the NERC Act or the Local Biodiversity Action Plan (LBAP) for the University of Cambridge were noted (University of Cambridge, 2020).

3.2.10 The importance of ecological features present within the Survey Area was determined based on the guidance given in CIEEM Guidelines for Preliminary Ecological Appraisal (CIEEM, 2017) and Guidelines for Ecological Impact Assessment (CIEEM, 2018).

3.2.11 Where possible, ecological features (habitats and species that could be affected by the proposed works) were assigned levels of importance for nature conservation. The hierarchy of importance used in this report scales from international, national, regional, county, local and lastly Site level (CIEEM, 2018).

3.3 Biodiversity Net Gain baseline assessment

3.3.1 Biodiversity metric calculations provide a numerical score for the current value (Habitat Units, Hedgerow Units and/or River (watercourse) Units) of the habitats on Site and their likely value post-development in order for the impact of the proposed development to be quantitatively assessed. This report assessed the baseline only.

3.3.2 The Biodiversity Net Gain baseline assessment used the current biometric tool, the 'Biodiversity Metric 3.1 Auditing and accounting for biodiversity - Calculation Tool' (BM3.1) (Natural England, 2022). This tool has been developed by Natural England to enable developers, planners and land managers to quantify the current value of a site for nature and how proposed changes will impact on that value.

3.3.3 Habitat measurements have been taken using digital mapping software (QGIS Geographic Information System version 3.26).

3.3.4 BM3.1 uses a classification system based mainly on the UK Habitat Classification System (UKHab). Where applicable, habitats were subject to a condition assessment in accordance with the Condition Assessment Sheets included within the 'Biodiversity Metric 3.1: Auditing and accounting for biodiversity – Condition Assessment Sheets (Natural England, 2022)'. The condition of each habitat was assessed and scored as either good, moderate, or poor. If a habitat type varied in condition this was recorded and mapped.

3.3.5 Using the BM3.1 tool, habitat values are calculated based on whether they occur commonly or whether they are rare, their area (ha) (or length (km) for linear features such as hedgerows), condition and importance within the local area, usually identified from local relevant planning policies or documents. This gives individual pre-development Habitat Units (HU), Hedgerow Units (HeU) and Watercourse Units (WaU).

3.3.6 The results of the BNG assessment are detailed within section 4.

3.4 Protected species

3.4.1 Any evidence of, or potential for protected or otherwise notable species encountered during the survey was recorded. This included observations of field signs and an assessment of the suitability of the habitats present to support protected species.

Amphibians

3.4.2 A desk-based assessment was undertaken using a 1:25,000 scale OS map to identify all waterbodies within 250 m of the Site that are not separated by a significant barrier to amphibian dispersal (such as a major road or watercourse).

3.4.3 As garden ponds within residential properties are often absent from OS map sources, aerial photography was also used to search for additional ponds.

3.4.4 Habitats present within the Site were assessed for their suitability to support amphibians including great crested newt (GCN) *Triturus cristatus*. The connectivity of any suitable habitat within the Site to other habitat within the surrounding area was assessed during the Site visit and through visual analysis of aerial imagery.

Badger

3.4.5 Field signs of badger *Meles meles* within the Survey Area were recorded in accordance with the standard methodology outlined by Harris et al. (1989), which includes surveying for setts and for field signs such as latrines, hairs, foraging signs and pathways.

Bats

3.4.6 In accordance with the Bat Conservation Trust's best practice guidelines (Collins, 2016), the suitability of habitat features within the Survey Area to support roosting bats was categorised as negligible, low, moderate or high. This was based on the number and type of roosting features and surrounding landscape character.

3.4.7 As there are a large number of trees and buildings present within the Survey Area, a separate assessment would needed to survey for the presence of Potential Roosting Features (PRFs) which could be used by roosting bats. Where PRF's were seen during the survey these were noted.

3.4.8 An individual tree or structure may have several PRFs associated with it. It is not always possible to confirm if a feature is used by bats, as bats may not use the feature frequently.

3.4.9 Habitats within the Survey Area were also assessed for their suitability to support foraging and commuting bats.

Birds

3.4.10 Species of birds noted incidentally during the survey were recorded where possible, and details of suitable habitats for nesting birds were noted, including those species with enhanced statutory protection.

Fish

3.4.11 Any watercourses present within the Survey Area were assessed for their suitability to support protected and notable fish species such as Atlantic salmon *Salmo salar*, brown trout *S. trutta* and

European eel *Anguilla anguilla*.

Hazel dormouse

3.4.12 Habitats within the Survey Area were assessed for their potential to support hazel dormouse *Muscardinus avellanarius*, including recording of plant species that could provide foraging and nesting habitat. The connectivity of any suitable habitat within the Survey Area to other habitat within the surrounding area was assessed during the survey and through studying aerial imagery.

Invertebrates including white-clawed crayfish

3.4.13 Habitats were assessed for their potential to support notable or protected terrestrial and aquatic invertebrates.

3.4.14 Any watercourses within the Survey Area were assessed for their suitability to support white-clawed crayfish *Austropotamobius pallipes*.

Otter

3.4.15 Watercourses and waterbodies within the Survey Area were assessed for their suitability to support otter *Lutra lutra*. This involved recording incidental sightings of field signs such as: droppings (spraints), footprints, feeding remains, lying-up areas, holts, areas of habitat considered suitable for otters and actual observations (Chanin, 2003).

3.4.16 Terrestrial habitats present within the Survey Area were also assessed for their suitability to support otter and for their connectivity to watercourses and other suitable habitat within the surrounding area.

Reptiles

3.4.17 The habitats present within the Survey Area were assessed for their suitability to support basking, foraging and hibernating reptiles. The connectivity of any suitable habitat within the Survey Area to other habitat within the surrounding area was assessed during the survey and through studying aerial imagery. Any incidental reptile encounters made during the survey were recorded.

Water vole

3.4.18 Watercourses and waterbodies within the Survey Area were assessed for their suitability to support water vole *Arvicola amphibius*. Any incidental evidence of water vole was recorded, such as: burrows, latrines, footprints, runs in the vegetation, grazed 'lawns', feeding remains and actual sightings (Dean *et al,* 2016).

3.4.19 Terrestrial habitats present within the Survey Area were also assessed for their suitability to support water voles and for their connectivity to watercourses and other suitable habitat within the surrounding area.

Other protected and notable species

3.4.20 Habitats were additionally assessed for their potential to support other protected species, nationally or locally scarce species, or notable species.

Invasive non-native species (INNS)

3.4.21 Any evidence of invasive non-native plant species listed under Schedule 9 of the WCA 1981 was recorded during the survey including, but not limited to: Japanese knotweed *Reynoutria japonica*, hybrid knotweed *R. x bohemica*, giant hogweed *Heracleum mantegazzianum* and Himalayan

balsam *Impatiens glandulifera*.

3.4.22 Evidence of invasive non-native animal species was noted incidentally and any relevant recommendations have been made in Section 5.

3.5 Limitations

3.5.1 Every effort has been made to provide a comprehensive description of the Site and Survey Area, but the following specific limitations apply to this appraisal.

3.5.2 The survey undertaken was intended to provide a rapid assessment of the habitats present within the Survey Area and was not intended to replace detailed vegetation or protected species surveys. Where a greater level of information is necessary to inform an assessment, recommendations have been made to undertake further detailed survey.

3.5.3 Surveys of this type provide a snapshot of the Survey Area at the time of the survey.

3.5.4 The Survey Area was surveyed largely from public rights of way as landowner permission was not confirmed. Most areas were visible however the south west of the Site was not visible or accessible at the time of the survey.

4. Results and discussion

4.1 Statutory designated sites

4.1.1 There were no sites designated at the international and European level located within 10 km of the Site, therefore international designated sites will not be a constraint.

4.1.2 There were nine statutory designated sites relating to nature conservation of national or less than national importance located within 2 km of the Site as detailed in Table 1 below and Figure 3 (CPERC, 2022).

Table 1: Statutory designated sites of national or less than national importance within 2 km of the Site

Site name	Designation	Distance from the Site at closest point	Reasons for designation
Nine Wells	Local Nature Reserve (LNR)	0 m east	Chalk streams in a woodland supporting rare invertebrates and a number of plant species. It is a former SSSI.
Gog Magog Golf Course	Site of Special Scientific Interest (SSSI)	937 m south east	Calcareous chalk grassland with nationally rare moon carrot *Seseli libanotis* and the locally rare flax *Linum anglicum.*
Cherry Hinton Pits	Site of Special Scientific Interest (SSSI)	973 m east	Herb-rich chalk grassland with four nationally rare plant species.
West Pit	Local Nature Reserve	973 m east	Former chalk quarry with a steeply sloping woodland. The moon carrot *Seseli libanotis* can be found here.
The Beechwoods	Local Nature Reserve	1130 m east	A woodland of beech trees *Fagus sylvatica* with a varied structure and chalky soil.
East Pit	Local Nature Reserve	1270 m north east	Herb-rich chalk grassland with four nationally rare plant species.
Sheeps Green	Local Nature Reserve	1660 m north west	Flood meadow with many

Site name	Designation	Distance from the Site at closest point	Reasons for designation
and Coe Fen			mature willow trees supporting a wide range of wildlife.
Limekiln Close	Local Nature Reserve	1770 m north east	Supports a population of a Nationally Rare non-vascular plant *Tortula vahliana.*
Byron's pool	Local Nature Reserve	2000 m west	Freshwater pool with high level of bird life.

4.1.3 Statutory designated sites may be a constraint to works as there are two SSSI's within 2 km of the Site. Depending on the proposal, a SSSI Impact Assessment may be required in order to determine whether consultation with Natural England is necessary.

4.1.4 Nine Wells LNR borders the Site and requires consideration in the masterplan in terms of the avoidance of direct and indirect impacts and the potential for the masterplan to contribute to its enhancement. This would require an environmental management plan to ensure its protection.

4.2 Non-statutory designated sites

4.2.1 There were 23 non-statutory designated sites for nature conservation within 2 km of the Site, listed in Appendix 3.

4.2.2 There are two non-statutory designated sites on the boundary of the Site and within the 30 m buffer. These are Red Cross Lane Drain and the Hedge West of Babraham Road, which both lie on the eastern border.

4.2.3 The Hedge West of Babraham Road is protected under The Hedgerows Regulations 1997. This is due to it containing 4 or more woody species and multiple trees, it runs parallel to a ditch (Red Cross Lane Drain) and also is adjacent to a footpath.

4.2.4 These two sites could be a constraint to works.

4.3 Other important habitats

Ancient woodland

4.3.1 The MAGIC results confirmed the presence of no ancient woodland sites within 2 km of the Site listed within the Ancient Woodland Inventory (AWI).

Habitats of Principal Importance

4.3.2 Several Habitats of Principal Importance (HPIs) were included within the Natural England Priority Habitats Inventory database within 2 km of the Site. These comprised:

- Deciduous woodland at the boundary of the north, east and south of the Site and pockets throughout the surrounding area
- Traditional orchard 104 m south west
- Lowland calcareous grassland 277 m east

- Woodpasture and parkland 1600 m north and
- Floodplain grazing marsh 1920 m south

4.3.3 The deciduous woodland is on the boundary of the Site and within the 30 m buffer. Therefore an environmental management plan should be created to ensure that the woodland is protected from works. These woodlands could be utilised as green corridors during the design process.

4.3.4 The traditional orchard is 104 m from the Site and the lowland calcareous grassland is 277 m and therefore these areas would also benefit from an environmental management plan to ensure their protection. This is because even if these areas are not directly impacted by the works, there are environmental pressures such as pollution which could have a negative effect.

4.3.5 Other habitats listed are not considered a constraint to works as they are over 1 km from the Site.

Aquatic habitats

4.3.6 Three waterbodies were identified within 250 m of the Site. The nearest was 0 m east from the Site. Waterbodies within 250 m of the Site are listed below in order of distance from the Site in Table 2 below.

Table 2: Waterbodies within 250 m of the Site

Waterbody	Distance and direction from the Site
Pond	0 m east (within 30 m buffer)
Ditch	60 m west
Large pond	245 m west

4.3.7 One watercourse was identified within 30 m of the Site, which is a stream running into the Nine Wells LNR to the west. The stream is connected to the Hobson's Brook and further north west this is connected to the River Cam. In conjunction with dry ditches and ponds found on Site which could be full of water in winter months, there is hydrological connectivity in the Site.

4.4 Habitat assessment

4.4.1 The habitats within the Survey Area are detailed below in order of size (largest area to smallest area). The descriptions should be read with reference to the Habitat map (Figure 2) and the photographs in Appendix 1.

Cropland c1c7

4.4.2 The arable land was cereal crop which had been harvested at the time of the survey. It covered the greatest area of land in the southern part of the Site (Figure 2b, Appendix 1). There is no condition assessment on cropland in the Biodiversity Metric.

4.4.3 This habitat does not qualify under HPI or Annex 1.

4.4.4 Cereal cropland has little biodiversity value except for the species it may support, which are discussed separately. It also generates a significant number of units within the Biodiversity Metric, due to its large area.

Developed, sealed ground u1b, 89, 111

4.4.5 The greatest area of land on the northern side of the Site is covered by developed, sealed ground (Appendix 1, Figure 2a). This is inclusive of buildings and roads which cover most of the northern area of the Site. There is no condition assessment for this habitat and there is little opportunity for biodiversity.

4.4.6 This habitat does not qualify under HPI or Annex 1.

4.4.7 Developed, sealed ground is not a constraint to the works and it does not generate biodiversity units in the Biodiversity Metric. It does however provide an opportunity for biodiversity enhancement.

Suburban mosaic of developed/natural surface and gardens u1 and u1d, 720, 10

4.4.8 There were pockets of municipal premises open space throughout the northern section of the Site, consisting of variable sizes. All areas look to be under a high maintenance regime, with regularly mown grass. Many areas contained paths running through them and features such as benches. Some had maintained ornamental scrub and/or trees. Those areas with developed surfaces were categorised as u1d and those without were u1. Both categories were converted to vegetated gardens under the BNG metric. as there is no direct conversion.

4.4.9 This habitat does not qualify under HPI or Annex 1.

4.4.10 Suburban mosaic of developed/natural surface and gardens is not a constraint to the works, but provides an opportunity for biodiversity enhancement.

Ruderal/ephemeral sparsely vegetated land s, 17

4.4.11 There is sparsely vegetated land across the site which had some grasses interspersed with a high level of ruderal/ephemeral plants. The south has a ruderal/ephemeral margin of about 2 - 5 m around the edges of the cropland (Appendix 1, plate 1). It is unknown if there was a wildflower mix sown, however it is unlikely based on the species found and is not likely to have been cultivated since. The north section of the site has large areas of sparsely vegetated land. Species identified during the survey using the DAFOR scale: creeping thistle *Cirsium arvense* (A); creeping cinquefoil *Potentilla reptans* (A); perennial rye-grass *Lolium perenne* (A); cock's-foot *Dactylis glomerata* (A); yarrow *Achillea millefolium* (A); common ragwort *Senecio jacobaea* (F); false oat grass *Arrhenatherum elatius* (F); Yorkshire fog *Holcus lanatus* (F); spear thistle *Cirsium vulgare* (F); common mallow *Malva sylvestris* (F); field bindweed *Convolvulus arvensis* (F); curled dock *Rumex crispus* (O); knotgrass *Polygonum Aviculare* (O); ribwort plantain *Plantago lanceolata* (O); wild mignonette *Reseda lutea* (O); soapwort *Saponaria otficinalis* (O); prickly sow thistle *Sonchus asper* (O); hogweed *Heracleum sphondylium* (O); common knapweed *Centaurea nigra* (O); common daisy *Bellis perennis* (O); prickly lettuce *Lactuca serriola* (R); chicory *Cichorium intybus* (R); poppy *Papaver rhoeas* (R); wild oat *Avena fatua* (R) and white campion *Silene latifolia* (R).

4.4.12 The condition of most of these areas were identified as moderate. There was a wide range of species providing nectar for invertebrates and there were no invasive non-native plants identified. However there was no variation in vegetation height. One area running down the Addenbrooke cycle path did contain a variation in vegetation height due to a line of trees and some scrub, which was categorised as in good condition.

4.4.13 Some of the arable field margins may qualify as HPI dependent on their management under any stewardship agreements, however they do not meet the definitions of arable field margins under

UKHab guidance (Butcher et al 2020).

4.4.14 Arable field margins may be a receptor to the proposed works.

Bare ground u1c

4.4.15 There were three locations of bare ground prepared for building works. One area was assigned this habitat code under an assumption it was either cleared for development or being developed, as the area was boarded up (Figure 2a-b). None of these areas had plants, so there was no DAFOR scale to record. They looked to be developed soon and there was machinery seen on one of the areas.

4.4.16 These areas of bare ground were assessed as being in poor condition as they did not have any plants growing.

4.4.17 This habitat does not qualify under HPI or Annex 1.

4.4.18 This habitat is not considered a constraint to works.

Other deciduous woodland w1g7, 56

4.4.19 Other deciduous woodland were all areas which had recently planted, young trees. There were fairly similar amounts of each of the following native species seen in the plantation woodlands: hazel *Corylus avellana* (F); dogwood *Cornus sanguinea* (F); hawthorn *Crataegus monogyna* (F); field maple *Acer campestre* (F) and blackthorn *Prunus spinosa* (O).

4.4.20 The woodland type was assessed as being in moderate condition as the trees were native, healthy and there was no sign of disease or pest However as they had been planted recently there was only one age of tree, no dead wood or canopy cover.

4.4.21 This habitat does not qualify under HPI or Annex 1.

4.4.22 This habitat is not considered a constraint to works, however its biodiversity potential in the future should be considered.

Line of trees w1g6

4.4.23 There are lines of trees across the southern area of the Site which were wider than a metre at the base and therefore mapped as a polygon. It is thought they were originally grown as a hedge and were not maintained as such, growing out into trees. They were all the same age and likely planted at the same time. The species were all native aside from Horse chestnut *Aesculus hippocastanum*. Other areas of lines of trees were converted into urban trees in the BNG assessment due to their proximity to roads and buildings. Species identified during the survey using the DAFOR scale: hazel *Corylus avellana* (A); dogwood *Cornus sanguinea* (A); hawthorn *Crataegus monogyna* (F); field maple *Acer campestre* (F); blackthorn *Prunus spinosa* (O); sycamore *Acer pseudoplatanus* (O); crab apple *Malus sylvestris* (R); horse chestnut (R).

4.4.24 The lines of trees on the Site were assessed as being in moderate condition. This is because 70% of the species were native, at least 95% of the trees were deemed to be healthy and most trees had reached 2/3 of their height, qualifying as mature.

4.4.25 This habitat does not qualify under HPI or Annex 1.

4.4.26 This habitat is not considered a constraint to works but has biodiversity value as reflected in the Biodiversity Metric.

Other mixed woodland w1h6

4.4.27 There is a mix of coniferous and deciduous trees surrounding buildings in the east of the northern section of the Site. There was squirrel damage on some trees and they were populous in the area. Species included pine sp. (F); hazel (F); sycamore (F).

4.4.28 This woodland type was assessed as being in moderate condition.

4.4.29 This habitat does not qualify under HPI or Annex 1.

4.4.30 This habitat is not considered a constraint to works but has biodiversity value as reflected in the Biodiversity Metric.

Lowland mixed deciduous woodland w1f7

4.4.31 There were two areas of lowland mixed deciduous woodland on the Site. The area on the southern section was an area of mature trees, mostly comprised of ash *Fraxinus excelsior* (D) with some field maple *Acer campestre* (O). There was some evidence of maintenance to keep the adjacent footpath clear and this has resulted in a high level of dead wood on the ground. The other deciduous woodland category was a location in the very north of the Site which also had similar mature native species. Neither area had signs of woodland ground flora however the survey was undertaken after the optimum period for the identification of these.

4.4.32 This woodland type were assessed as being in moderate condition.

4.4.33 Lowland deciduous woodland qualifies under HPI and would therefore be a constraint to works.

Dense scrub h3h

4.4.34 There are two pockets of dense scrub on the south site which both contain shrubs mixed with trees. One area is flanked by both a line of trees and a plantation woodland which gives the section a good variation in vegetation cover. On a DAFOR scale the species identified in the dense scrub were: hawthorn (F); sycamore (R). The second area to the east of the site had a mature walnut tree *Juglans regia.*

4.4.35 These areas of dense scrub were assessed as being in moderate condition. This is because there was an age range of mature to young shrubs, there were no non-native invasive plant species observed and there were at least three woody species present. The eastern area had no clearings in the scrub and the western area had no grassland/herbs flanking the location.

4.4.36 This habitat does not qualify under HPI or Annex 1.

4.4.37 This habitat is not considered a constraint to works but has biodiversity value as reflected in the Biodiversity Metric.

Ponds r1a6

4.4.38 All ponds on the Site were dry at the time of survey. These were identified as Bioswale in the BNG Metric due to their role in supporting flood relief. There were terrestrial and marginalplant species noted including great willowherb *Epilobium hirsutum* (A)*;* rosebay willowherb *Chamaenerion angustifolium* (A); common ragwort (O); great reedmace *Typha latifolia* (R) and purple loosestrife *Lythrum salicaria* (O).

4.4.39 These manmade waterbodies do not meet the criteria for HPI.

4.4.40 This habitat is not considered a constraint to works but has biodiversity value as reflected in the

Biodiversity Metric.

Ditches r1e

4.4.41 All ditches on Site were dry at the time of the survey. The ditches on the northern area of the Site had been created in line with a development and thought to be for drainage purposes. They did not have a natural surface and were lined with rocks. The other ditches along the Addenbrooke cycle path and in the green corridor towards Nine Wells LNR were more naturalised. However, none of the ditches contained aquatic vegetation and all contained some level of anthropogenic disturbance due to their proximity to footpaths.

4.4.42 There was no vegetation growing within the ditches, and the ditch in the northern area of the site had an unnatural surface so was assessed as being in poor condition. The encroachment of the ditches were major in the north of the site due to their proximity to urban development, and the ditch running through the mature woodland and green corridor had minor encroachment due to its natural surroundings.

4.4.43 This habitat does not qualify under HPI or Annex 1.

4.4.44 This habitat is not considered a constraint to works but has biodiversity value as reflected in the Biodiversity Metric.

Priority hedgerows and hedgerows h2a and h2

4.4.45 All hedgerows on the southern area of the Site had 80% or more woody native species and some had five species or more which categorised them under the native species rich hedgerow in the BNG calculations. Species found in the hedges were as follows: hawthorn (A); hazel (F); dogwood (F); field maple (F) and blackthorn (O). In the north of the Site there were multiple hedgerows, the longest of which was a beech *Fagus sylvatica* hedge.

4.4.46 All hedgerows on the southern part of the Site were in good condition.

4.4.47 Hedgerows are a constraint to the works as most qualify as HPI and some may be protected under The Hedgerows Regulations 1997.

4.5 Protected species

Amphibians, including great crested newt

4.5.1 CPERC returned 29 recent records for amphibians including common toad *bufo bufo*, and common frog *Rana temporaria* and 10 recent records for GCN within 2 km of the Site. The closest record for GCN is located on the boundary of the western edge of the Site to a precision of 100 m, in 2020. This states it was found in a pond and all the ponds within 100 m of this record are within the Survey area.

4.5.2 According to MAGIC, there were two granted EPS licences relating to GCN located within 2 km of the Site, as detailed in Table 3. MAGIC also identified ten GCN class survey licence returns.

Table 3: GCN EPS licences within 2 km of the Site

Licence number	Distance and direction from the Site	Licence impacts	Date
2017-30442-EPS-MIT-1	1450 m south west	Destruction of a resting	04/04/2018 to

Licence number	Distance and direction from the Site	Licence impacts	Date
		place	30/06/2021
2017-30442-EPS-MIT	1450 m south west	Destruction of a resting place	29/08/2017 to 30/06/2021

4.5.3 There were two waterbodies identified within 250 m of the Site. The closest waterbody is adjacent to the eastern boundary of the Site. These waterbodies are connected to the Site through a series of ditches and ponds within the Site and discussed in the habitats section. The Addenbrooke Road acts as a potential partial barrier between the ponds, but unlikely to have significant effect on GCN dispersal.

4.5.4 Three waterbodies were identified during the survey which were all dried out ponds thought to be created recently in relation to other developments. It is likely they dry out annually and unknown if they were wet during the GCN breeding season. Although water quality could not be determined, the vegetation around the ponds would provide good habitat for shelter and the absence of fish show a suitability for GCN and other amphibians. The presence of GCN near the Site including two EPS licences means there is a local population of GCN that could move into these new ponds.

4.5.5 As such, GCN and common amphibians are considered a potential constraint to the proposed works.

Badger

4.5.6 CPERC returned 14 recent records of badger within 2 km of the Site. The closest record for badger was located approximately 320 m west of the Site.

4.5.7 One sett was recorded on the Site (Appendix 1, plate 7), in [redacted] [this information must be redacted if this report is made public, for reasons of animal welfare]. Therefore we know badger have been utilising the Site.

4.5.8 There are several habitats suitable for badger on the Site. Arable fields and margins are good for badger dispersal and for feeding. The woodland area in the middle of the Site was suitable for sett creation and the railway running down the western edge had an embankment which was also suitable for sett creation. Railways provide good connectivity for dispersal. The developed section of the Site to the north was not suitable for badgers as they would be too highly disturbed to use the area for feeding and it is unlikely they could build a sett.

4.5.9 Access was not available in the arable field in the south west during the time of the survey. Therefore a badger sett cannot be ruled out here.

4.5.10 As such, badgers are considered a potential constraint to the proposed works.

Bats

4.5.11 CPERC returned 175 records of bats within 2 km of the Site. The records related to the following species: serotine *Eptesicus serotinus*, barbastelle *Barbastella barbastellus (*Annexe II species*),* Daubenton's bat *Myotis daubentonii*, Natterer's bat *Myotis nattereri,* Noctule *Nyctalus noctula*, common pipistrelle *Pipistrellus pipistrellus,* soprano pipistrelle *Pipistrellus pygmaeus* and Brown

long-eared bat *Plecotus auritus.*

4.5.12 The closest record related to a common pipistrelle found injured in a building within the Site. The closest roost is at White Hill Farm, on the border of the Site.

4.5.13 The records pertain to 12 roosts within 2 km of the Site, including day roosts and maternal roosts.

4.5.14 The barbastelle is an Annex II bat so receives enhanced protection under the Habitats Regulations. It is also a county and University of Cambridge BAP priority species.

4.5.15 According to MAGIC, there were five granted EPS licences relating to bats located within 2 km of the Site, which are displayed in Appendix 4.

4.5.16 Table 4 describes the trees noted to contain potential roosting features within the Survey Area.

Table 4: Trees and structures with PRFs within the Survey Area

Tree/Structure	Location	Details	Bat roost suitability
Mature woodland	TL 46431 54451 to TL 46524 54501	Mature trees covered in ivy, likely to contain PRFs	moderate
Single tree	TL 46744 55144	Knot hole in sycamore tree	moderate

4.5.17 The mature woodland is a linear feature which is of moderate suitability for roosting bats (Table 4). The trees here do not look as though they have been managed for a long time and there is dead wood both in the trees and on the ground. It was not possible to ascertain if there are rot holes or other PRFs in the trees due to the high ivy coverage, however the age of the trees means they could possess PRFs. The ivy itself can also be used by roosting bats. Therefore these trees could provide shelter and roosting opportunity. They also provide a green corridor for bats commuting across the Site.

4.5.18 The tree in table 4 has a knot hole which could provide shelter and space for roosting for one or more bats. However there was only one PRF and it is not likely to support a large number of bats on a regular basis.

4.5.19 There are lines of trees across the Site which are suitable for foraging and commuting bats. There is a line of trees either side of the mature woodland and this section runs 620 m in length. It also runs into Nine Wells LNR, which provides good habitat connectivity with suitable habitat in the wider area.

4.5.20 Buildings across the northern section of the Site could have features that are suitable for bat roosts. This includes gaps under tiles, in between bricks and other small holes which bats can shelter inside.

4.5.21 Due to the reports of bat roosts on the western edge of the Site and the moderate potential for roosting bats on the Site, roosting bats are a constraint to the works.

4.5.22 Due to the presence of lines of trees and hedgerows across the southern area of the Site, foraging and commuting bats are a potential receptor to the proposed works. Commuting and foraging bats could be disturbed from the works and from lighting.

Birds

4.5.23 CPERC returned 757 records of 77 bird species from within 2 km of the Site. These included 16 species that are protected under Schedule 1 of the WCA 1981, eight species listed as Species of Principal Importance (SPI) under Section 41 of the NERC Act, and 66 species listed as Red or Amber in the Birds of Conservation Concern (BoCC) (Stanbury *et al*., 2021), as detailed in Appendix 5.

4.5.24 A report published in 2021 discusses the breeding sites of nine red list species and 7-9 amber list species, showing the arable land has a good population of birds including grey partridge *Perdix perdix* and corn bunting *Emberiza calandra* (Meed, 2021). Farmland birds have declined greatly in the UK and many are species of principal importance. There were also skylark *Alauda arvensis* breeding which are a county-wide and University of Cambridge priority species.

4.5.25 There have been reports of Barn Owls within 2 km of the Site, the closest of which was 803 m south. There could be potential for barn owl to feed in the arable fields and margins. During the survey there were no potential nesting sites or signs of barn owl observed.

4.5.26 Species noted incidentally during the survey were blackbird *Turdus merula*, blue tit, *Cyanistes caeruleus,* greenfinch *Chloris chloris*, green woodpecker *Picus viridis*, goldfinch *Carduelis carduelis*, great tit *Parus major*, jay *Garrulus glandarius*, kestrel *Falco tinnunculus* and robin *Erithacus rubecula.*

4.5.27 All habitats within the Site have nesting potential for birds. Arable cropland provides opportunity for ground nesting birds such as skylark to nest, which have been recorded on the Site. Hedgerows and trees throughout the Site including in urban areas provide suitable nesting habitat. Birds may also nest on buildings in developed areas of the Site.

4.5.28 Nesting and wintering birds are a constraint to works as the habitats throughout are highly suitable

Otter

4.5.29 CPERC returned six records of otter or otter field signs within 2 km of the Site, the closest of which was spraint 300 m west of the Site.

4.5.30 According to MAGIC, there were no granted EPS licences relating to otter located within 2 km of the Site.

4.5.31 During the survey there were no waterways seen and all ditches were dried out, so the Site was not suitable for otter at the time of survey.

4.5.32 In the wider area there are some waterways including the stream through Nine Wells LNR. At least one record pertains to the River Cam to the west of the Site.

4.5.33 No otter or otter field signs were seen during the survey.

4.5.34 There is low potential to affect otter unless the development has an impact on the waterways near the Site.

Fish

4.5.35 CPERC returned no records of fish within 2 km of the Site.

4.5.36 There were ditches and ponds on the Site but they were all dry. Therefore the Site is unlikely to support fish.

4.5.37 The stream in Nine Wells LNR to the west and the Hobsons Brook to the north of the Site could support fish.

4.5.38 Fish are not considered a potential constraint to the proposed works.

Hazel dormouse

4.5.39 CPERC returned no records of hazel dormouse within 2 km of the Site.

4.5.40 According to MAGIC, there were no granted EPS licences relating to hazel dormouse located within 2 km of the Site.

4.5.41 The Site supports small fragmented areas of woodland and most of the trees have been planted very recently. This means the Site is unlikely to support dormice.

4.5.42 There is little connectivity between the wooded sections of the Site and the surrounding area. Although it is adjacent to Nine Wells LNR, this is a fragmented area.

4.5.43 There were no incidental sightings of dormouse or dormouse field signs during survey.

4.5.44 Dormice are not considered a potential constraint to the proposed works.

Invertebrates including white-clawed crayfish

4.5.45 CPERC returned no records of white-clawed crayfish.

4.5.46 49 records of other invertebrate species were returned within 2 km of the Site. The closest record pertained to a Belladonna flea beetle *Epitrix atropae* 189 m west of the Site in 2019.

4.5.47 As all of the waterbodies were dry it is unlikely the Site provides any habitat for white-clawed crayfish. In addition there was no running water on the Site. There is a range of habitat across the Site suitable for other invertebrates. Woodland has a high suitability for invertebrates and the mature lowland deciduous woodland contains dead wood suitable for notable invertebrate species such as Stag beetle *Lucanus cervus*. Farmland and arable field margins contain ephemeral plants which provide nectar and shelter for invertebrates. Hedgerows are also suitable for invertebrates with a variable vegetation height creating a greater diversity in microhabitats and places to shelter.

4.5.48 The closest freshwater stream to the Site is in Nine Wells LNR, approximately 20 m from the Site boundary. There were no incidental sightings of white-clawed crayfish during the survey.

4.5.49 There are no recent records of white-clawed crayfish and no suitable habitat on the Site. Therefore white-clawed crayfish is not considered to be a constraint to works. Provisions for terrestrial invertebrates should be part of the masterplan.

Reptiles

4.5.50 CPERC returned 14 recent records for reptiles including Grass Snake *Natrix helvetica* and Common Lizard *Zootoca vivipara* within 2 km of the Site. The closest record pertains to a grass snake within the Survey Area, approximately 5 m west of the Site in 2019.

4.5.51 There was suitable habitat on the Site for foraging, basking and sheltering. There was refugia within the woodland and scrub including dead wood which would provide shelter for reptiles. The sparsely vegetated areas are suitable for feeding and for basking and the arable cropland is also suitable for feeding. The hedgerows on the Site could be utilised as shelter for reptiles and are a good edge habitat surrounding the cropland. The ditches and ponds provide good dispersal opportunity. The north side of the Site has high levels of anthropogenic disturbance and therefore only suitable for

a small population of basking reptiles.

4.5.52 There is suitable habitat within Survey Area and wider area for common reptiles. The wider area contains much of the same habitat as the Site, with arable land, some woodland and urban areas. The Survey Area is not suitable for smooth snake as it is not heathland and is outside of the known distribution of the species.

4.5.53 There were no incidental sightings of reptiles during the survey.

4.5.54 There is a potential to affect reptiles during the works due to the suitability of the habitat on the Site and wider area. As such, reptiles are a potential constraint to the works.

Water vole

4.5.55 CPERC returned 20 records of water vole within 2 km of the Site. The closest record is in a ditch on the Addenbrookes to Great Shelford cycleway in 2017, which runs through the centre of the Site.

4.5.56 During the survey the ditches seen were completely dried out, which means at the time they were not likely to support water vole. However the data search suggests the ditches can support water vole.

4.5.57 In the wider area there is a high connectivity of small waterways which could be suitable for water vole. There have been sightings on the River Cam and in Hobsons brook which is north of the Site.

4.5.58 There were no incidental sightings during survey.

4.5.59 Water vole may be a constraint to works and a further survey should be conducted

Other protected and notable species

4.5.60 CPERC returned 46 records of other protected and notable species including 29 records for West European Hedgehog *Erinaceus europaeus*, 15 records for Brown Hare *Lepus europaeus* and two records for Polecat *Mustela putorius* within 2 km of the Site. The closest record pertained to a Brown hare within the Site in the arable cropland. It is a county and University of Cambridge BAP priority species.

4.5.61 The Site has suitable habitat for hedgehog and brown hare. There is opportunity for both species to forage with the woodland, scrub and hedgerows are ideal for hedgehog. The arable cropland is good for brown hares to utilise for feeding and to hide from disturbance.

4.5.62 The Survey Area also provides suitable habitat, with green corridors connecting the Site to the wider area of arable land allowing for dispersal and further foraging opportunities.

4.5.63 Rabbits are not protected however there were burrows seen on site and crushing and asphyxiation of rabbits is an offence under the Wild Mammals (Protection) Act 1996. This means any removal of burrows should be completed using hand tools and not machinery to reduce the likelihood of crushing and asphyxiation.

4.5.64 There were no incidental sightings of protected or notable species during the survey.

4.5.65 The works have the potential to affect hedgehogs and brown hares through habitat destruction and anthropogenic disturbance such as noise pollution.

Invasive non-native species (INNS)

4.5.66 CPERC returned 78 records of species including Few-Flowered Garlic *Allium paradoxum*, Hollyberry Cotoneaster *Cotoneaster bullatus*, Wall Cotoneaster *C. horizontalis*, Himalayan Cotoneaster *C. simonsii*, New Zealand Pigmyweed *Crassula helmsii*, Montbretia *Crocosmia pottsii x aurea = C. x crocosmiiflora*, Nuttall's Waterweed *Elodea nuttallii*, Japanese Knotweed *Fallopia japonica*, Giant Hogweed *Heracleum mantegazzianum*, Floating Pennywort *hydrocotyle ranunculoides*, Himalayan Balsam *Impatiens glandulifera*, Variegated Yellow Archangel *Lamiastrum galeobdolon* subsp. argentatum, False-acacia *Robinia pseudoacacia* and Perfoliate Alexanders *Smyrnium perfoliatum* within 2 km of the Site. The closest record pertains to a False-acacia planted in the north section of the Site and Variegated Yellow Archangel found on the border near Nine Wells LNR in 2013. It should be noted that 71 of these records have a precision to the nearest 1 km, which means they are approximate locations.

4.5.67 There were no INNS found on Site or within Survey Area, however there was *Buddleia davidii* seen on the northern section of the Site (Figure 2c). This is not listed on Schedule 9 of the Wildlife and Countryside Act however it should be controlled as it spreads very quickly and can out-compete other species.

4.5.68 INNS are not considered to be a constraint to works however if there are INNS identified prior to or during works then control measures must be put in place. It is recommended to remove the buddleia before it spreads.

4.6 Site biodiversity baseline

4.6.1 Baseline habitats present on the Site included Cereal crops, Developed land; sealed surface, Ruderal/ephemeral, vacant/derelict land/bareground, Other woodland; broadleaved, Urban Tree, Other woodland; mixed, Lowland mixed deciduous woodland, Mixed scrub and Bioswale.

4.6.2 For this assessment the baseline habitat types and areas have been taken from the habitat survey carried out as part of the PEA for the Site (Figure 2).

4.6.3 The total area has been calculated at 140.01 ha. The habitat type, condition, area and HU are provided within Table 5 below. Baseline habitats have produced a biodiversity value of 268.55 HU for area habitats, 43.49 HeU for linear habitats and 4.64 WaU for watercourse habitats.

Table 5: The Site Baseline area-based habitats, condition and Habitat Units

Habitat Type	Condition	Area (ha)	Habitat Units
Cereal crops	N/A	61.49	122.99
Developed land; sealed surface	N/A	43.09	0.00
Vegetated garden	N/A	11.274	24.80
Sparsely vegetated land Ruderal/Ephemeral	Moderate	10.43	41.72
Vacant/ derelict land/ bareground	Poor	4.49	8.98
Urban Tree	Poor	2.8405	12.5
Other woodland; broadleaved	Moderate	1.8112	16.66
Urban Tree	Moderate	1.6115	14.18

Habitat Type	Condition	Area (ha)	Habitat Units
Other woodland; mixed	Moderate	0.97	8.95
Lowland mixed deciduous woodland	Moderate	0.75	10.41
Mixed scrub	Moderate	0.46	4.01
Bioswale	Poor	0.43	0.99
Sparsely vegetated land Ruderal/Ephemeral	Good	0.36	2.36
Total Habitat Units			268.55

Table 5b: The Site Baseline linear-based habitats, condition and Hedgerow Units

Habitat Type	Condition	Length (km)	Hedgerow Units
Native Species Rich Hedgerow	Good	1.96	26.99
Native Hedgerow	Good	1.53	10.52
Line of trees	Moderate	1.24	5.86
Ornamental Hedgerow	Poor	0.29	0.29
Total Hedgerow Units			43.49

Table 5c: The Site Baseline watercourses, condition and Watercourse Units

Watercourse type	Condition	Length (km)	Watercourse Units
Ditch	Poor	1.683	3.29
Ditch	Poor	0.433	1.35
Total Watercourse Units			4.64

5. Ecological constraints, opportunities and recommendations

5.1 Potential impacts and effects

5.1.1 The proposed works are not yet designed but it is thought they have the potential to result in the following direct and indirect impacts:

- *Increased temporary and permanent lighting;*
- *Increased noise and vibration from machinery and personnel;*
- *De-vegetation for access and to make way for development.*

5.1.2 These impacts may result in the following effects, which are described in more detail in Table 6:

- *Loss of habitat including cropland, hedgerows, ruderal/ephemeral sparsely vegetated land, scrub and woodland.*
- *Damage to cropland, hedgerows, ruderal/ephemeral sparsely vegetated land, scrub and woodland.*
- *A reduction in the suitable habitat available for badger, bats, GCN, reptiles and nesting birds.*
- *Killing and injury of amphibians including GCN, reptiles and nesting birds.*
- *Disturbance of roosting bats and commuting bats, reptiles, GCN, badger, nesting birds, water vole, hedgehog and brown hare.*

5.2 Constraints and mitigation measures

5.2.1 The ecological constraints and mitigation required to address the above are detailed in Table 6 on the following pages.

5.2.2 The information contained within this report is valid for a period of 18 months from the date of the survey visit (CIEEM, 2019).

5.2.3 The survey undertaken is to inform the masterplan design, it is likely this survey will require updating prior to the submission of a planning application.

Table 6: Ecological Constraints and Opportunities

Feature/Constraint	Potential Impact and Effect	Action Required	Deliverable	Timing
Designated sites and other notable habitats				
Gog Magog Golf Course SSSI	Impact from noise and light and other pollution.	Depending on the proposals it is likely potential effects to the SSSIs will need to be considered within the EcIA, and consultation required with Natural England as part of the planning application	SSSI impact assessment and consultation with Natural England	In advance of works
Cherry Hinton Pits SSSI				
Nine Wells LNR	Impact from noise and light and other pollution	Environmental Management Plan, including protection and enhancement.	EMP	
Hedge West of Babraham Road	De-vegetation during works causing habitat loss and damage to a protected hedgerow	These features should be retained and enhanced. If the proposals include modifying the hedgerow or drain adjacent the LPA must be consulted. Otherwise, they should be included in an Environmental Management Plan to avoid negative impacts from works.	Consultation with LPA and agreement of measures and EMP	In advance of works
Red Cross Lane Drain	Habitat damage Impacts from pollution			
Hedgerows	Damage to protected hedgerows	Hedgerows should be retained and enhanced. Hedgerow Assessment to determine which hedgerows in the Site are Important under the Hedgerows Regulations 1997	Hedgerow Assessment	In advance of works
Deciduous woodland	Potential habitat loss and damage	Woodland on and adjacent to the Site should be retained, protected and enhanced. Environmental management plan.	EMP	In advance of works
Arable field margins	Potential habitat loss and damage	Arable field margins on Site should be retained, protected and enhanced. Environmental management plan.	EMP	In advance of works

Feature/Constraint	Potential Impact and Effect	Action Required	Deliverable	Timing
Waterbodies and watercourses	Potential negative impacts due to the proximity of these areas to the Site. Depending on the work proposals there may be environmental pressures	Environmental management plan	EMP	In advance of works
Traditional orchard		Avoid using these sites for compounds or works access		
Lowland calcareous grassland				
Protected and notable species				
Amphibians including great crested newts	Habitat loss and direct injury	Acquire a GCN District level licence for the works or alternatively undertake conventional survey, and licensing if GCN are found to be present.	GCN district level licence or conventional methods	In advance of works
		Ecological Clerk of Works (ECoW) during vegetation clearance	On-site ECoW	During works
Badger		Survey the south end of the Site, which could not be accessed. Badgers can rapidly colonise new areas therefore survey data should be kept up to date to inform the planning application. Depending on the proposals and potential impacts, surveys into the wider landscape together with territory mapping (using bait marking) may be required.	Ecological surveys	In advance of works
	Sett destruction and direct injury	ECoW prior to and during vegetation clearance. Setts should be retained and protected. If this is not possible, a licence would be required, and an artificial sett may be required as compensation.	On-site ECoW Licence	During works
Bats (roosting)	Roost site destruction or disturbance	If any buildings are proposed to be refurbished or demolished, there should be a PRA to identify potential roost features and determine if further survey is required.	Potential further surveys (daytime inspections and dusk emergence surveys)	In advance of works

Feature/Constraint	Potential Impact and Effect	Action Required	Deliverable	Timing
		If trees with potential roosting features are proposed to be felled, there should be a PRA on the trees to determine if further survey is required.	Potential further surveys (aerial inspections)	In advance of works
Bats (foraging and commuting)	Disturbance from noise pollution and lighting during construction and operation. Habitat destruction and fragmentation through de-vegetation.	Transect survey to be undertaken once a month in the green corridor running into Nine Wells LNR and other hedgerows on Site, from April to October to determine the usage of Site by bats. Remote monitoring using static detectors.	Bat transect and static activity surveys	In advance of works
Birds (nesting and wintering)	Nest destruction through de-vegetation. Ground nesting birds could be injured by machinery.	If the current research providing breeding and wintering bird data ceases, updated surveys should be undertaken to inform the planning application. This would comprise of several visits over the spring/early summer and winter periods. If there are significant losses of suitable habitat, compensation will be required. This may require an improvement in the quality of suitable foraging and nesting habitat to compensate for a reduced quantity.	Potential breeding bird surveys Potential winter bird surveys Habitat compensation	In advance of works
	Disturbance from noise and lighting during works. Disturbance during the operational phase.	Works to be completed outside of bird-nesting season.	Avoid works in bird nesting season	During works
Otter	Pollutants entering waterways Indirect disturbance	If the works will affect waterways or take place within 30 m of a waterway, an otter survey should be carried out.	Potential further surveys	In advance of works
Reptiles	Disturbance and loss of foraging, sheltering and dispersal habitat.	Presence/absence surveys required. Further surveys may be required to establish	Reptile presence/absence	In advance of works

Feature/Constraint	Potential Impact and Effect	Action Required	Deliverable	Timing
	Potential direct injury from machinery.	population size depending on the results.	surveys	
Water vole	Water vole may be a constraint to works if the ditch running down the Addenbrooke cycle path is due to be fragmented or if there will be high disturbance in this area.	A water vole habitat suitability assessment should be conducted during the spring when water levels are likely to be higher. If suitable water vole habitat is present, a search for field signs in spring/early summer and late summer/early autumn should be undertaken	Water vole surveys	In advance of works
Hedgehog	Loss of feeding, sheltering and dispersal habitat through de-vegetation and site fragmentation.	Best practice measures (BPM) for hedgehogs should be implemented including checking debris or wood piles before works. Retain and enhance suitable habitat.	BPM	During works
Brown Hare	Loss of feeding, sheltering and dispersal habitat through de-vegetation and site fragmentation.	Retain and enhance suitable habitat. Best practice for brown hares should be implemented.	BPM	During works
Rabbits	Mechanical removal of rabbit burrows could increase chances of asphyxiation.	If rabbit burrows need to be removed, use hand tools instead of mechanical removal techniques.	Use of hand tools to dig out rabbit burrows	During works
INNS				
All species	Spread of INNS across Site	If any INNS are identified during works, control methods should be put in place	Be vigilant and report INNS on site	In advance of and during works
BNG				
The extent of the development and units lost are not known. Cropland is the dominant habitat on site and whilst it does not generate a large number of units per hectare, it makes a significant contribution to the overall quantitative biodiversity value of the Site due to its large area. All habitats which generate biodiversity units, as well as those which have separate biodiversity value (e.g. as habitats for protected species), should be considered in the biodiversity masterplan.				

5.3 Ecological opportunities

5.3.1 The following opportunities have been identified for the Site and should be used as guiding principles for the masterplan. Suitable enhancement for specific species groups will be designed following the completion of the recommended surveys.

- Retain and enhance lowland woodland and the green corridor running into Nine Wells LNR by strengthening and widening the corridor, creating a wooded buffer to the LNR, and improving species diversity through effective management;
- Plant new areas of species-rich native deciduous woodland;
- Provide green corridors between fragmented areas of semi-natural habitat;
- Retain and enhance existing hedgerows and arable field margins;
- Create some areas of standing water which is wet all year round;
- The substrate seems to be chalk-rich, therefore consider the creation of species-rich chalk grassland.

5.3.2 It is understood there is an aspiration to achieve at least 20% quantitative Biodiversity Net Gain. The biodiversity design must fulfil all of the biodiversity good practice principles (CIRIA, 2019). The biodiversity design process must be iterative and continue to be integrated into the design process at these early stages, so that a design is reached which protects and enhances habitats and species populations and achieves net gains for the environment as a whole, including landscape, water and heritage. It is understood separate work is being undertaken to assess Environmental Net Gain / Natural Capital, and this is encouraged.

5.3.3 The large areas of ‘low’ and ‘very low’ distinctiveness habitats on Site, and also the lack of ‘very high distinctiveness’ and ‘irreplaceable’ habitats on Site means there is more opportunity and flexibility on Site to deliver gains than would be the case if the ‘baseline’ or ‘starting point’ was higher. That said, to maximise gains and also achieve a balanced design as discussed above, the possibility of off-site compensation should not be ruled out at this stage.

5.4 Conclusions

5.4.1 The Site is dominated by cropland in the south and built development in the north. There are smaller areas of other habitat types which are generally of higher biodiversity value, for example woodland, hedgerows and other field margins.

5.4.2 Further survey has been recommended for a number of species, species groups and habitats. These surveys are required to inform the EcIA and subsequent planning application.

5.4.3 The Site provides an excellent opportunity for biodiversity enhancement. A future biodiversity strategy will need to balance the requirements for quantitative biodiversity net gain against the needs of the current assemblage of species present, in particular species which require large areas of cropland and/or grassland such as ground nesting farmland birds.

6. References

Butcher, B., Carey, P., Edmonds, R., Norton, L. and Treweek, J. (2020) The UK Habitat Classification User Manual Verson 1.1 at http://www.ukhab.org/

Cambridgeshire Green Infrastructure Forum, 2020. Cambridgeshire Green Infrastructure Strategy Appendix 5.

Cambridgeshire and Peterborough Environmental Records Centre (CPERC), 2022. Designated and Non-designated Sites. Used as Figure 3

Collins, J. (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd ed.). The Bat Conservation Trust, London.

CIEEM (2017) Guidelines for Preliminary Ecological Appraisal, (2nd ed.) Chartered Institute of Ecology and Environmental Management, Winchester.

CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. Chartered Institute of Ecology and Environmental Management, Winchester.

Eaton, M. A., Aebischer, N. J., Brown, A. F., Hearn, R., Lock, L., Musgrove, A. J. and Gregory, R. D. (2009) The population status of birds in the United Kingdom, Channel Islands and Isle of Man. British Birds, 108: 708-746.

Harris, S., Cresswell, P. and Jefferies, D. (1989) Surveying Badgers. Mammal Society (Occasional Publication No 9).

MAGIC (2022) Multi-Agency Geographical Information for the Countryside website. Available online: https://magic.defra.gov.uk/

Meed, J., 2021. The Value of the Green belt South of Cambridge to Populations of Farmland Birds.

Natural England (2022) The Biodiversity Metric 3.1: auditing and accounting for biodiversity

QGIS.org, 2022. QGIS Geographic Information System. QGIS Association.

University of Cambridge, 2020. Biodiversity Action Plan.

Figure 1: Site location plan

ecus
part of CuraTerrae

Legend

Survey Area
Site Boundary

0 250 500 m

Figure 1

Cambridge Biomedical Campus
Survey Area

Figure 2a-b: Habitat Map

ecus
part of CuraTerrae

Legend

- 1 Target Notes
- w1g6 - line of trees
- h2 - hedgerow
- h2a - hedgerow (Priority Habitat)
- r1e - canal or ditch
- u1c - artificial unvegatated unsealed surface
- 10 - scattered scrub
- 11 - scattered young trees
- w1f - lowland mixed deciduous woodland
- w1g6 - line of trees
- w1h - other woodland mixed
- c1c - cereal crops
- u1 - built-up areas and gardens
- u1b - developed land. sealed surface
- u1b5 - buildings
- u1b6 - other developed land
- u1c - artificial unvegetated unsealed surface
- u1d - suburban mosaic of developed/natural surface
- s - sparsely vegetated land
- r1a - eutrophic standing waters

0 50 100 150 200 m

Hydrock

Cambridge Biomedical Campus
Preliminary Ecological Appraisal

Figure 2a. UKHab Habitat Map
Northern Extent

▪ Brook Holt ▪ 3 Blackburn Road ▪ Sheffield ▪ S61 2DW
▪ tel: 0114 266 9292 ▪ www.ecusltd.co.uk

August 2022 | Scale: 1:3,345 @A3 | Drg.Ref: IS/19132/1