



UNIVERSAL DESTINATIONS & EXPERIENCES UK PROJECT

Former Kempston Hardwick Brickworks
and adjoining land, Bedford

Environmental Statement Volume 3

Appendix 6.1 - Preliminary Ecological Appraisal Report

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CONTENTS

1	INTRODUCTION	1
1.1	PROJECT BACKGROUND	1
1.2	SCOPE OF REPORT	1
1.3	RELEVANT LEGISLATION AND POLICY	1
2	METHODS	3
2.1	OVERVIEW	3
2.2	DESK STUDY	3
2.3	HABITAT SURVEY	4
2.4	PROTECTED SPECIES ASSESSMENT	5
2.5	NOTES AND LIMITATIONS	5
3	RESULTS	7
3.1	DESIGNATED SITES	7
3.2	HABITAT SURVEY	9
3.3	PROTECTED AND NOTABLE SPECIES ASSESSMENT	16
4	CONCLUSION	25

TABLES

Table 3-1 – National Network sites within 30km of the Site where bats are the primary designation feature	7
Table 3-2 – Non-statutory designated sites located within 2km of the Site	7
Table 3-3 – UKHab categories and areas	10
Table 3-4 – Summary of bird records for Kempston Hardwick Pit CWS and Coronation Pit CWS	21

ANNEXES

Annex 1

Figure

Annex 2

Plant Species List

Annex 3

Indicative Site Photographs

1 INTRODUCTION

1.1 PROJECT BACKGROUND

- 1.1.1. This Preliminary Ecological Appraisal (PEA) Report, has been prepared in support of the planning proposal for the Proposed Development as described in **Chapter 2: Description of the Proposed Development (Volume 1)** of the Environmental Statement (ES).
- 1.1.2. The report has been prepared to support the Ecological Impact Assessment (EclA), **Chapter 6: Ecology and Nature Conservation (Volume 1)** of the ES.
- 1.1.3. The land within the area of the Proposed Development is shown in **Figure 1: Site boundary and Access Restricted Areas on Site of Annex 1: Figures** and will hereafter be referred to as 'the Site', and is split into four Zones: Lake Zone, Core Zone, East Gateway Zone and West Gateway Zone.
- 1.1.4. The Site boundary has been revised on a number of occasions since the PEA survey was undertaken in January 2024, however at each revision this report has been reviewed and updated accordingly including habitat areas and descriptions, distances and information relating to potential relevant constraints.

1.2 SCOPE OF REPORT

- 1.2.1. WSP UK Limited was first commissioned to undertake a PEA of the Site in January 2024. The purpose of the PEA was to provide baseline ecological information about the Site and a surrounding study area with particular reference to whether legally protected and/or notable sites, species or habitats are present or likely to be present.
- 1.2.2. WSP have provided this report solely for the use of the recipient and accepts no liability to any third parties or any other party using or reviewing the report or any part thereof. WSP makes no warranties or guarantees, actual or implied, in relation to this report, or the ultimate commercial, technical, economic, or financial effect on the project to which it relates, and bears no responsibility or liability related to its use other than as set out within the scope of the contract under which it was supplied.

1.3 RELEVANT LEGISLATION AND POLICY

- 1.3.1. The appraisal has been compiled with reference to the following relevant nature conservation legislation, planning policy and the *UK Biodiversity Framework*¹ from which the protection of sites, habitats and species is derived in England. The context and applicability of each item is explained as appropriate in the relevant sections of the report and additional details are presented in **Appendix 3.1: Legislation, Policy and Guidance for all ES Technical Topics (Volume 3)**.
 - *The Conservation of Habitats and Species Regulations 2017 (as amended) (Habitats Regulations)*²;

¹ Joint Nature Conservation Committee (2024) *UK Biodiversity Framework*. Available at: <https://data.jncc.gov.uk/data/19a729f6-440e-4ac6-8894-cc72e84cc3bb/uk-biodiversity-framework.pdf> [Accessed: 18 March 2025].

² HM Government (2017) *The Conservation of Habitats and Species Regulations 2017*. Available at: <https://www.legislation.gov.uk/ukxi/2017/1012/contents> [Accessed: 18 March 2025].

- *Environment Act 2021*³;
- *The Wildlife and Countryside Act 1981 (as amended) (WCA)*⁴;
- *Natural Environment and Rural Communities (NERC) Act 2006 (as amended) (England)*⁵;
- *The Protection of Badgers Act 1992*⁶;
- *The Hedgerows Regulations 1997*⁷; and
- *National Planning Policy Framework (NPPF) 2024*⁸.

³ HM Government (2021) *Environment Act 2021*. Available at: <https://www.legislation.gov.uk/ukpga/2021/30/contents> [Accessed: 18 March 2025].

⁴ HM Government (1981) *Wildlife and Countryside Act 1981*. Available at: <https://www.legislation.gov.uk/ukpga/1981/69> [Accessed: 18 March 2025].

⁵ HM Government (2006) *Natural Environment and Rural Communities Act 2006*. Available at: <https://www.legislation.gov.uk/ukpga/2006/16/contents> [Accessed: 18 March 2025].

⁶ HM Government (1992) *Protection of Badgers Act 1992*. Available at: <https://www.legislation.gov.uk/ukpga/1992/51/contents> [Accessed: 18 March 2025].

⁷ HM Government (1997) *The Hedgerows Regulations 1997*. Available at: <https://www.legislation.gov.uk/uksi/1997/1160/contents> [Accessed: 18 March 2025].

⁸ Ministry of Housing, Communities and Local Government (2024) *National Planning Policy Framework*. Available at: https://assets.publishing.service.gov.uk/media/67aafe8f3b41f783cca46251/NPPF_December_2024.pdf [Accessed: 18 March 2025].

2 METHODS

2.1 OVERVIEW

2.1.1. This appraisal has been prepared with reference to current good practice guidance published by the Chartered Institute for Ecology and Environmental Management (CIEEM), comprising the following documents:

- *Guidelines for Ecological Report Writing*⁹;
- *Guidelines for Preliminary Ecological Appraisal, 2nd edition*¹⁰; and
- *Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater and Coastal*¹¹.

2.1.2. This PEA is based on the following data sources:

- An ecological desk study; and
- A field survey.

2.2 DESK STUDY

2.2.1. The desk study was undertaken in February 2024. It involved a review of existing ecological baseline information available in the public domain, and collation of information obtained from relevant third parties. For the purpose of the desk study exercise, records were collated within 2km, 10km and/or 30km radius of the Site as defined below. These areas collectively are defined as the desk study area. This approach is consistent with current good practice guidance published by CIEEM^{9,10}. To provide the baseline data for the ecological desk study, the following information was requested from Bedfordshire and Luton Biodiversity Recording and Monitoring Centre:

- Records of legally protected and notable species within 2km of the Site; and
- Records of non-statutory sites designated for nature conservation value within 2km of the Site.

2.2.2. Natural England datasets were consulted for information regarding:

- The presence of statutory designated sites for nature conservation within 2km of the Site; and
- Habitat Sites (Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Ramsar sites within 10km of the Site). Where bats are the primary designation feature the desk study area was extended to within 30km of the Site.

⁹ Chartered Institute for Ecology and Environmental Management (2017a) *Guidelines for Ecological Report Writing, Second Edition*. Available at: <https://cieem.net/wp-content/uploads/2019/02/Ecological-Report-Writing-Dec2017.pdf> [Accessed: 18 March 2025].

¹⁰ Chartered Institute for Ecology and Environmental Management (2017b) *Guidelines for Preliminary Ecological Appraisal, Second Edition*. Available at: <https://cieem.net/wp-content/uploads/2019/02/Guidelines-for-Preliminary-Ecological-Appraisal-Jan2018-1.pdf> [Accessed: 18 March 2025].

¹¹ Chartered Institute for Ecology and Environmental Management (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland, Terrestrial, Freshwater, Coastal and Marine*. Available at: <https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf> [Accessed: 18 March 2025].

- 2.2.3. This included information on the impact risk zones for Sites of Special Scientific Interest (SSSIs) which were checked using Natural England's Multi-Agency Geographic Information for the Countryside (Magic) mapping application¹².
- 2.2.4. Additional freely downloadable datasets (available from Natural England) were consulted for information regarding Habitats of Principal Importance (HPIs)¹³ and woodland listed on the Ancient Woodland Inventory¹⁴ within 1km of the Site. Open source 1:25,000 Ordnance Survey (OS) mapping was used to identify any mapped water bodies and watercourses within 500m of the Site.
- 2.2.5. The data collated by the desk study have been incorporated within Section 3.

2.3 HABITAT SURVEY

UKHAB SURVEY

- 2.3.1. The field survey, undertaken in January, February and April 2024 included a UK Habitat Classification (UKHab) the purpose of which is to identify and assess the habitat types present within the Site. The survey covered all areas of the Site, where land access was permitted (see Section 2.5) (the 'Field Survey Area'). The UKHab survey was carried out by two suitably qualified and experienced habitat surveyors.
- 2.3.2. Habitats were described and mapped following *The UK Habitat Classification System* Version 2.0¹⁵. The dominant plant species are recorded, and habitats are classified according to their vegetation types.
- 2.3.3. The UKHab system¹⁵ comprises a principal hierarchy (the Primary Habitats) and non-hierarchical Secondary Codes. Primary Habitats include ecosystems (level 1), broad habitat types (level 2 and level 3), more defined habitats including HPI (level 4) and further defined habitats including **Annex I** habitats (level 5). Habitats were classified to level 5 where possible. Where relevant, Secondary Codes were used to provide further detail on habitats as detailed in the UK Habitat Classification 2.0.
- 2.3.4. A single Primary Habitat is assigned to each polygon, line or point feature with generally a maximum of six secondary codes used. Habitats are described by the Primary Habitat first (e.g., w1h5 other woodland; mixed predominantly broadleaved) with secondary codes following (e.g., w1h5 36 57 other woodland; mixed predominantly broadleaved that is plantation with young trees - self set). Lowercase letters are used, with the levels 2 to 5 shown by the alphanumeric code and no commas are used between secondary codes as per the UKHab User Manual¹⁶. For habitats of interest that were too small to map, point features were used with primary habitats and secondary codes where applicable.

¹² Department for Environment Food and Rural Affairs (n.d.) *Magic Map*. Available at: <https://magic.defra.gov.uk/> [Accessed: 18 March 2025].

¹³ Mapped locations of HPI are usually not available, but HPI aligns in the most part with UK Biodiversity Action Plan (UKBAP) habitats. Inventories of UKBAP habitat have been prepared by a variety of organisations and at a national (Natural England priority habitat inventory) and local scale (e.g. by local records centres). In some instances these are primarily based on aerial photograph analysis rather than field survey. Available to download here: [Priority Habitats Inventory \(England\) - data.gov.uk](https://priorityhabitats.defra.gov.uk/)

¹⁴ Natural England (2024) *Ancient Woodland (England)*. Available at: <https://naturalengland.defra.gov.uk/datasets/ancient-woodland-england/explore> [Accessed: 18 March 2025].

¹⁵ UKHab (n.d.) *The UK Habitat Classification System*. Available at: <https://ukhab.org/> [Accessed: 18 March 2025].

¹⁶ UKHab Ltd (2023). *UK Habitat Classification Version 2.0*. Available at <https://www.ukhab.org> [Accessed: 22 May 2025].

- 2.3.5. A list of plant species was compiled with relative plant species abundance estimated using the DAFOR scale¹⁷ (see **Annex 2**). The scientific names for plant species follow those in the *New Flora of the British Isles*¹⁸ and are also listed in **Annex 3**.
- 2.3.6. Habitats were digitised using a Geographical Information System (GIS).
- 2.3.7. Any invasive plant species listed on *Schedule 9* of the *WCA*⁴, which were evident during the field survey, were also target noted.
- 2.3.8. UKHab was chosen as the method to classify habitats on-Site, so that the data gathered could subsequently be used to inform a future EcIA.

HEDGEROW SURVEY

- 2.3.9. Survey methodologies outlined in the *Hedgerow Handbook*¹⁹ were followed for the hedgerow survey, and the species richness of hedgerows was assessed by sampling 30m sections along the hedgerow in accordance with the guidelines.
- 2.3.10. In the UKHab methodology, hedgerows are split into priority and non-priority hedgerows. Priority hedgerows are HPI under the *NERC Act 2006 (as amended)*⁵. To qualify as a priority hedgerow, they must comprise predominantly (80% or more cover) of at least one woody species. This is the methodology that has been used to define the hedgerows on-Site.
- 2.3.11. The UKHab methodology, split into 'species rich native hedgerows' (native hedgerows with more than five species present), 'other native hedgerows' and 'non-native ornamental hedgerows'.
- 2.3.12. Hedgerows can also be legislatively protected as an important hedgerow under *The Hedgerows Regulations 1997*⁷. The optimal survey season for hedgerows is April to September, therefore this assessment was not undertaken for this PEA.

2.4 PROTECTED SPECIES ASSESSMENT

- 2.4.1. The potential for the Site to support legally protected and notable species was assessed using the desk study results combined with known species distributions, and field observations during the survey. The assessment of habitat suitability for protected and notable species was based on professional experience and judgement. The field survey area for protected species included all areas within the Site, plus a 30m buffer beyond the Site boundary, where access was possible.

2.5 NOTES AND LIMITATIONS

- 2.5.1. Some specific areas of the Site were not directly accessed on foot for survey due to health and safety considerations, namely the railway corridor located in the East Gateway Zone and the verges of the A421 road to the west of the Site as shown on **Figure 1: Site boundary and Access Restricted Areas on Site of Annex 1: Figures**. These areas were viewed from neighbouring locations where possible and mapped from aerial photography.

¹⁷ The DAFOR scale has been used to estimate the frequency and cover of the different plant species as follows: Dominant (D) - >75% cover, Abundant (A) – 51-75% cover, Frequent (F) – 26-50% cover, Occasional (O) – 11-25% cover, Rare (R) – 1-10% cover., The term 'Locally' (L) is also used where the frequency and distribution of a species are patchy and 'Edge' (E) is also used where a species only occurs on the edge of a habitat type.

¹⁸ Stace, C.A. (2019) *New Flora of the British Isles, Fourth Edition*.

¹⁹ Department for Environment Food and Rural Affairs (2007) *Hedgerow Survey Handbook, A standard procedure for local surveys in the UK*. Available at: https://www.hedgelink.org.uk/cms/cms_content/files/89_hedgerow-survey-handbook.pdf [Accessed: 18 March 2025].

- 2.5.2. Ecological survey data is typically valid for 18 months to three years unless otherwise specified, for example if conditions are likely to change more quickly due to ecological processes or anticipated changes in management²⁰.
- 2.5.3. Records held by local biological record centres and local recording groups are generally collected on a voluntary basis; therefore, the absence of records does not demonstrate the absence of species, it may simply indicate a gap in recording coverage. Additionally, a previous iteration of the Site boundary was used to request records from the biological records centre, however as the changes to the Site boundary were minor the results are considered to be sufficient to inform the PEA.
- 2.5.4. Excluding one survey day in April, the survey was not completed during the optimal botanical survey season for a UKHab survey, generally accepted to be from April to September (inclusive). The information presented within this report is based upon data collected from January – April 2024. Further surveys were undertaken within the optimal survey season for UK Hab and are reported in **Appendix 6.14: UK Habitat Classification Report (Volume 3)**.
- 2.5.5. A detailed Ground Level Tree Assessment (GLTA) or Preliminary Roost Assessment (PRA) (of structures) was not undertaken in combination with the PEA but have been subsequently conducted to inform the EclA. Trees and structures noted incidentally as having potential bat roosting suitability were recorded as such.
- 2.5.6. Whilst taking into account the limitations noted above, sufficient information was gathered from the field survey and desk based data to confidently identify potential ecological constraints and further survey requirements.

²⁰ Chartered Institute of Ecology and Environmental Management (2019) *Advice note on the lifespan of ecological reports and surveys*. Available at: <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf> [Accessed: 24 March 2025].

3 RESULTS

3.1 DESIGNATED SITES

3.1.1. Ecological designations are mapped and presented in **Figure 6.1: Ecological Designations Plan (Volume 2)**.

STATUTORY SITES

- 3.1.2. The desk study identified one SAC where bats are the primary designation feature within 30km of the Site, with details presented in **Table 3-1**. The desk study identified no National Site Network sites or Ramsar sites (hereafter referred to collectively as Habitats Sites) within 10km of the Site.
- 3.1.3. The desk study confirmed that there are no statutory designated sites of national or local importance within the desk study area. The Site falls within the impact risk zone of one SSSI, although the Proposed Development does not correspond with the activities described in the Impact Risk Zone (IRZ) which would require consultation with Natural England.

Table 3-1 – National Network sites within 30km of the Site where bats are the primary designation feature

Site Name	Designation	Size (ha)	Distance and Orientation from the Site	Reasons for Designation
Eversden and Wimpole Woods SAC	SAC	66.48	29.4km northeast	Eversden Wood consists of a mixture of ancient coppice woodland and high forest woods likely to be of more recent origin. The habitats present also support a nationally important summer maternity roost for barbastelle bats (<i>Barbastella barbastellus</i>).

NON-STATUTORY SITES

- 3.1.4. The desk study identified ten non-statutory designated sites located entirely or partially within the desk study area. A summary of these sites is detailed in **Table 3-2**. Of these, two; Kempston Hardwick Pit County Wildlife Site (CWS) and Coronation Pit CWS, extend partially into the Site, with approximately 26ha (30%) and 5ha (5.2%) extending within the Site, respectively.

Table 3-2 – Non-statutory designated sites located within 2km of the Site

Site Name	Size (ha)	Approximate Distance and Orientation from the Site	Designation Features (as described in the citation)
Kempston Hardwick Pit CWS	86.6	Partially within the Site (Lake Zone) Approximately 26.13ha of the CWS extend into the Site boundary. This	The CWS was designated for the habitat mosaic of woodland, scrub, semi-improved neutral grassland, and open water. It contained neutral grassland, semi-natural broadleaved woodland, broadleaved plantation, scrub, and ditches. The grasslands contained nine neutral/calcareous species, including four strong

Site Name	Size (ha)	Approximate Distance and Orientation from the Site	Designation Features (as described in the citation)
		equates to approximately 30% of the total area of the CWS.	indicators, and the wetland communities contain nine species of fen, swamps, and marshes, including one strong indicator. New Zealand pypyweed (<i>Crassula helmsii</i>) and other non-native invasive plant species have been recorded within the CWS.
Coronation Pit CWS	95.4	Partially within the Site (Core Zone) Approximately 5ha of the CWS (woodland and scrub habitats) extend into the Site boundary. This equates to approximately 5.2% of the total area of the CWS.	The CWS was primarily designated for the large (33ha) waterbody which is a former quarry excavation. In addition, the citation included neutral and calcareous grassland habitats which were present. The CWS contained semi-natural broadleaved woodland plantations, areas of dense scrub, and patches of tall swamp vegetation. The centre of the site was dominated by calcareous grassland and pools caused by the old quarrying activity, where the pools had abundant marginal and submerged aquatic vegetation. There was a small area of acidic grassland present at TL03404379. The site hosted open mosaic habitats on previously developed land.
Stewartby Lake CWS	111.48	0.22km southeast	The CWS was recognised for containing calcareous grassland, neutral grassland, and ponds. Within the grassland were several small areas of marshy grassland and shallow ponds.
Elstow Pit CWS	32	0.21km east	The CWS comprised the southern part of Elstow Pit and was designated for mosaic grassland, neutral grassland, scrub, swamp, and open water habitats. The eastern lake contained abundant aquatic vegetation in the shallows, and the muddy margins contained frequent rushes. Small islands in the lake contained bushes of common hawthorn (<i>Crataegus monogyna</i>). Lakes were surrounded by grassland with scattered scrub and trees.
Quest Pit CWS	68.88	0.62km southeast	The CWS was designated primarily due to the wetland areas being an important habitat for a range of rare bird species including little egret (<i>Egretta garzetta</i>), lesser black-backed gull (<i>Larus fuscus</i>), shelduck (<i>Tadorna sp.</i>), herring gull (<i>Larus argentatus</i>), gadwall (<i>Mareca strepera</i>), ringed plover (<i>Charadrius hiaticula</i>), little ringed plover (<i>Charadrius dubius</i>), redshank (<i>Tringa tetanus</i>), and pochard (<i>Aythya farina</i>).
Kempston West End CWS	0.46	0.71km north	The CWS was recognised for colonies of common calamint (<i>Clinopodium ascenden</i>) and creeping yellow cress (<i>Rorippa sylvestris</i>), and was composed of a mosaic of coarse grassland with large bramble (<i>Rubus fruticosus agg.</i>) patches, and areas of dense and developing scrub and woodland.

Site Name	Size (ha)	Approximate Distance and Orientation from the Site	Designation Features (as described in the citation)
Marston Bypass Roadside Nature Reserve (RNR)	0.7	0.90km southwest	The site consisted of a wide verge where the bypass diverged from the original road into Marston Moretaine south of the village, and a small area adjacent to a bridge over the road. Areas of the site were seeded with wildflowers when the road was built.
Rookery Clay Pit CWS	153.1	1.33km south	The CWS was recognised for containing three large pools, while the surrounding vegetation over most of the pit area was sparse ephemeral/short perennial with a large area of rank neutral grassland in the northwestern corner. Small patches of marsh vegetation were scattered throughout the grassland and the more northern part of the ephemeral vegetation. There was a broadleaved plantation at TL018418.
Wootton Wood CWS	50.59	1.47km west	The CWS was recognised for containing ancient semi-natural broadleaved woodland, and neutral grassland.
River Great Ouse CWS	213.1	1.65km north	CWS was recognised for the river habitat and adjacent habitats and features which were considered part of the river system.

OTHER HABITATS OF CONSERVATION IMPORTANCE

- 3.1.5. The desk study did not identify any areas of ancient (or ancient re-planted) woodland within 1km of the Site. There were however 61 areas of deciduous woodland and five areas of traditional orchard, which are listed as HPI under the *NERC Act (as amended)*⁵.
- 3.1.6. The Proposed Development will not affect the traditional orchard due to the distance from Site. However, the desk study identified 16 areas of deciduous woodland present within the desk study area; several of these are within the Site. This habitat forms part of the UKHab field survey for the Site, and potential effects and advice will be covered in future sections of the report.

3.2 HABITAT SURVEY

OVERVIEW

- 3.2.1. The majority of the habitats present within the Site, equating to a total area of 268ha, comprised arable fields bound by hedgerows and grassland margins, most notably within the Core Zone (equating to 96.7ha) and West Gateway Zone (42.8 ha). The Lake Zone (equating to a total area of 101.2 ha) consisted of more varied habitats, with large areas of waterbodies, reedbeds and other neutral grassland present. Towards the south of the Lake Zone, open mosaic habitat on previously developed land was recorded. Pockets of woodland and scrub were also present throughout the Site. The remaining areas within the Site primarily comprised roads and associated hardstanding, and a railway line was present to the east of the West Gateway Zone. Furthermore, the East Gateway Zone (comprising of 27.6ha) is dominated by the Midland Main Railway Line and associated vegetated corridor, which is a mixed and broad-leaved woodland. The East Gateway

Zone also includes the Manor Road corridor across the site which is dominated by areas of scattered and dense scrub.

- 3.2.2. In total, 22 UKHab habitat types were initially identified within the Field Survey Area. These habitat types are presented in Table 3-3 below and described in further detail in Sections 3.2.3 - 3.2.46. A figure showing the extent of the habitat types initially recorded has not been provided for this report, as following the updated UKHab survey that was subsequently undertaken during the optimal season (**Appendix 6.14: UK Habitat Classification Report (Volume 3)**), the most up to date figure showing these results is now that presented in **Figure 6.2: UK Habitats Plan (Volume 2)**, with this data used to inform the EclA. The data collected during the initial UKHab survey presented within this report was used to inform the further protected species survey requirements undertaken at the Site across 2024-2025 and presented in **Appendices 6.2 – 6.18 (Volume 3)**.
- 3.2.3. UKHab types are listed in **Table 3-3** along with areas in hectares (or length for linear features). A description of the dominant and notable species, the composition and management of each habitat is provided below, with an indicative species list provided in **Annex 2**. Site photographs are appended in **Annex 3**. The order of the habitat descriptions below reflects their ordering in the UKHab manual¹⁶ and does not reflect habitat importance.

Table 3-3 – UKHab categories and areas

UKHab Category	UKHab Code	Area (ha)	Length (m)	% of Site Area
Other lowland acid grassland	g1d	3.22	N/A	1.20
Other lowland acid grassland – open mosaic habitats on previously developed land	g1d 80	2.59	N/A	0.97
Other neutral grassland	g3c	33.12	N/A	12.40
Modified grassland	g4	8.44	N/A	3.16
Other lowland mixed deciduous woodland	w1f7	25.51	N/A	9.55
Ecologically valuable line of trees	w1g 34	N/A	277	N/A
Other broadleaved woodland - open mosaic habitats on previously developed land	w1g 80	0.27	N/A	0.10
Other broadleaved woodland – young trees – planted	w1g 201	0.67	N/A	0.25
Other woodland – mixed	w1h	0.14	N/A	0.05
Native hedgerow (HPI)	h2a	N/A	4,790	N/A
Other blackthorn scrub	h3a6	0.07	N/A	0.03
Bramble scrub	h3d	0.19	N/A	0.07
Hawthorn scrub	h3f	0.01	N/A	0.01

UKHab Category	UKHab Code	Area (ha)	Length (m)	% of Site Area
Mixed scrub	h3h	7.06	N/A	2.64
Mixed scrub - open mosaic habitats on previously developed land	h3h 80	0.42	N/A	0.16
Reedbeds	f2e	7.83	N/A	2.93
Cereal crops	c1c	140.40	N/A	52.58
Developed land – sealed surface	u1b	19.46	N/A	7.28
Artificial unvegetated – unsealed surface	u1c	5.64	N/A	2.11
Suburban mosaic of developed and natural surface	u1d	0.46	N/A	0.17
Standing open water and canals	r1	13.72	N/A	5.13
Rivers and streams	r2	N/A	8,675	N/A
TOTAL		269.16 ²¹	13,743	100

Other Lowland Acid Grassland – g1d

- 3.2.4. This habitat type consists of vegetation dominated by grasses and herbs on a range of lime-deficient soils. Such soils usually have a low base-status, with a pH of <5.5. An area of g1d was recorded near the northeastern boundary of the Lake Zone (**Plate 0-1** in **Annex 3**). The sward was dominated by lichens however other indicator species of acid grassland were not identified due to the survey taking place outside the optimal botanical survey season for UKHab as described within Section 2.5. The high abundance of lichens within the sward was indicative of grassland associated with acidic soil conditions therefore it was recorded as g1d. It is considered unlikely that the grassland would meet the criteria for lowland dry acid grassland which is an HPI, however this will be reaffirmed following a further UKHab survey planned to be completed within the optimal survey season in 2024.
- 3.2.5. A second area of this habitat was present towards the south of the Lake Zone which was also classified as open mosaic habitats on previously developed land (secondary code 80), which is an HPI. This area had previously been disturbed which had resulted in a mosaic of grassland habitat with areas of bare substrate and local variation in the plant species present.

²¹ Since the completion of this PEA, minor changes to the Site boundary have been made as the Proposed Development layout has evolved. The Site boundary as defined for the PEA, was slightly different to that latterly applied for the purposes of the ES. Therefore, the total of all habitats identified within the Site shown in **Table 3-3** equates to more than the 267ha within the Site at the ES stage.

Other Neutral Grassland – g3c

- 3.2.6. The majority of grassland within the Lake Zone was classified as other neutral grassland and was present in proximity to the waterbodies, along field margins and as small pockets of habitat within the hard standing (**Plate 0-2 in Annex 3**). Species recorded included reed sweet grass (*Glyceria maxima*), common reed (*Phragmites australis*), ground ivy (*Glechoma hederacea*), creeping cinquefoil (*Potentilla reptans*) and spiny restharrow (*Ononis spinosa*). It was not possible to confirm that these areas were other neutral grassland due to the survey taking place outside the optimal botanical survey season for UKHab as described within Section 2.5. This habitat has been classified as g3c on a precautionary basis.
- 3.2.7. The majority of grassland immediately bordering the A421 could not be accessed due to health and safety considerations. The grassland habitat has been classified as other neutral grassland on a precautionary basis. The only exception is where grass verges appeared regularly managed, displaying a short sward, these were classified as modified grassland.

Modified Grassland – g4

- 3.2.8. This habitat type was recorded along arable field margins and surrounding watercourses within arable fields throughout the Core Zone and West Gateway Zone (**Plate 0-3 in Annex 3**). This vegetation is characterised by the dominance of grass species which are palatable to livestock, with a low abundance and diversity of flowering species, which indicates high soil fertility. The management of this grassland was most often frequently mown (secondary code 108), displaying a short sward.
- 3.2.9. Where the grassland appeared regularly managed, displaying a short sward the habitat was classified as modified grassland.
- 3.2.10. Grass species recorded during the field survey included cock's-foot (*Dactylis glomerata*), false oat-grass (*Arrhenatherum elatius*) and common couch (*Elytrigia repens*). Abundant forbs included common nettle (*Urtica dioica*) and hemlock (*Conium maculatum*), with hedge bedstraw (*Galium album*) also recorded occasionally.

Other Lowland Mixed Deciduous Woodland – w1f7

- 3.2.11. This woodland habitat type is an HPI incorporating most semi-natural broadleaved woodland in southern and eastern England on the full range of soil types, with great variety in species composition of the canopy and ground layer.
- 3.2.12. An area of w1f7 woodland was recorded along the boundary of the Lake Zone, west of the B530 (**Plate 0-1 in Annex 3**). Common ash, wild cherry (*Prunus avium*), sycamore (*Acer pseudoplatanus*), Norway maple, elder and willow (*Salix* sp.) were recorded within the woodland. Approximately 10% of the woodland comprised Scots pine.
- 3.2.13. A second area of w1f7 woodland was recorded surrounding the southernmost waterbody within the Lake Zone. The woodland was mature plantation woodland and was approximately 10m wide. The species present included blackthorn and sycamore. There was limited ground flora recorded.

- 3.2.14. Another area of w1f7 woodland was recorded in the East Gateway Zone along the northern boundary of the Core Zone (**Plate 0-4 in Annex 3**). The woodland was plantation and consisted of mature oak (*Quercus robur*), field maple and hazel with the ground flora dominated by common ivy (*Hedera helix*). A further three areas of lowland mixed deciduous woodland were recorded within the Core Zone, along the boundaries.
- 3.2.15. Finally, an area of w1f7 woodland was observed along the northern boundary of the West Gateway Zone. There was no access into the woodland, therefore it was visually surveyed from its boundary. The woodland was semi-mature and the canopy was dominated by common ash, with abundant field maple and frequent willow recorded. The shrub layer consisted of common hawthorn and bramble with common nettle present within the ground layer. Dead wood was also observed.
- 3.2.16. The areas of distinct woodland adjacent to local roads on the boundary of the Site could not be fully accessed due to land access restrictions. The habitat has been classified as lowland mixed deciduous woodland on a precautionary basis and what could be determined from online aerial sources.

Ecologically Valuable Line of Trees – w1g 34

- 3.2.17. A line of mature trees was present south of Manor Road, dividing two fields within the Core Zone. Multiple large gaps were present within the line of trees.

Other Broadleaved Woodland

- 3.2.18. This habitat type is classified as broadleaved mixed and yew woodland not meeting the criteria of w1a to w1f. An area of this habitat was present towards the south of the Lake Zone which was also classified as open mosaic habitats on previously developed land (secondary code 80) (**Plate 0-5 in Annex 3**), also an HPI. The woodland primarily consisted of young silver birch with the ground flora dominated by lichen.
- 3.2.19. Additionally, two areas of other broadleaved woodland were identified west of the A421 which could not be accessed due to access restrictions. These areas consisted of newly planted trees with guards to protect the trees still visible.

Other Woodland – Mixed - w1h

- 3.2.20. This habitat type is classified as a mixture of broadleaved and coniferous trees in which neither make up >80% of the tree cover. A single area of w1h was recorded along the boundary of the West Gateway Zone (**Plate 0-6 in Annex 3**). There was no access to this woodland, therefore it was surveyed from the edge. The woodland consisted of abundant common ash and field maple with frequent Scots pine and elder also present. Hazel and oak were also present occasionally in the canopy layer and frequently in the shrub layer. There was a limited ground layer with occasional bramble saplings and hedge bedstraw present.

Native Hedgerow (HPI) – h2a

- 3.2.21. Hedgerows were present along the boundaries of arable field margins and bordering roads. There were 11 distinct section of hedgerow present across the Lake Zone, Core Zone and West Gateway Zone (none were identified in the East Gateway Zone). All of the hedgerows present align to the category as a Habitat of Principal Importance under the *NERC Act 2006 (as amended)*⁵. The hedgerows comprised species such as common hawthorn, blackthorn, elder, dog rose (*Rosa canina*) and elm (*Ulmus sp.*). The hedgerow margins included species such as common couch, cleavers (*Galium aparine*), hemlock, false oat-grass and common nettle.
- 3.2.22. A further five hedgerows have been identified (by a review of aerial mapping) within the areas that could not be accessed due to access restrictions. These hedgerows have been classified as native hedgerow (HPI) on a precautionary basis and were located bordering roads.
- 3.2.23. Hedgerows were not assessed in line with *The Hedgerows Regulations 1997*⁷, therefore it is unknown whether any of the hedgerows were Important Hedgerows.

Other Blackthorn Scrub – h3a6

- 3.2.24. Two areas of blackthorn scrub were recorded along the eastern boundary of the West Gateway Zone, adjacent to the railway line. The scrub was dominated by blackthorn with abundant bramble also present. Another small area of scrub dominated by blackthorn was recorded along the eastern bank of the watercourse running through the West Gateway Zone (**Plate 0-7 in Annex 3**).

Bramble Scrub – h3d

- 3.2.25. A single area of bramble scrub was recorded along the eastern boundary of the West Gateway Zone, adjacent to the railway line. The scrub was dominated by bramble.
- 3.2.26. Another area of bramble scrub was identified bordering the western edge of Woburn Road in an area that could not be accessed due to access restrictions.

Hawthorn Scrub – h3f

- 3.2.27. Two small areas of hawthorn dominant scrub were recorded along the northern boundary of the West Gateway Zone. Both areas only consisted of common hawthorn (**Plate 0-8 in Annex 3**).

Mixed Scrub – h3h

- 3.2.28. This habitat type was recorded along field margins, surrounding watercourses and within urban areas within the Lake Zone and Core Zone (**Plate 0-9 in Annex 3**). Species recorded included butterfly bush (*Buddleja sp.*) and common hawthorn. Two areas of this habitat were present towards the south of the Lake Zone which were also classified as open mosaic habitats on previously developed land (secondary code 80) which is an HPI.
- 3.2.29. Multiple areas of scrub were identified bordering the roads throughout the Site within areas that were not accessed. This habitat was classified as mixed scrub apart from where it was clearly dominated by a species such as bramble.

Reedbeds – f2e

- 3.2.30. Reedbed is an HPI and includes wetlands that are dominated by >5m wide stands of common reed and where the water table is at or above ground level for most of the year. All but one of the waterbodies within the Lake Zone were completely or partially surrounded by areas of reedbed (**Plate 0-10 in Annex 3**). These areas were dominated by common reed.

Cereal Crops – c1c

- 3.2.31. The majority of the Core Zone and West Gateway Zone consisted of arable fields (**Plate 0-11 in Annex 3**).

Developed Land – Sealed Surface – u1b

- 3.2.32. Many sections of the Site were on existing roads which were tarmac or concrete including the A421, Manor Road and Broadmead Road.

Artificial Unvegetated – Unsealed Surface – u1c

- 3.2.33. The Marston Vale Railway Line and Midland Main Railway Line running along the eastern boundaries of the Lake Zone and the West Gateway Zone respectively consist of artificial unvegetated – unsealed surface. An area within the centre of the Lake Zone, west of one of the waterbodies, also consisted of bare earth.

Suburban Mosaic of Developed and Natural Surface – u1d

- 3.2.34. This habitat classification was used to define small-scale mosaics of developed and natural surfaces, i.e., housing and gardens in sub-urban areas.

Standing Open Water – r1

- 3.2.35. In total ten waterbodies, classified within this habitat category were identified within the Site.
- 3.2.36. Four lakes were present across the extent of the Lake Zone, which are associated with the Kempston Hardwick former quarry and brick pit workings (**Plate 0-12 in Annex 3**). The southern lake is surrounded by dense scrub. The three lakes located to the northeast of this lake; one comprising of a much larger area of open water are surrounded by a mosaic of grassland and successional scattered scrub and young trees. The southern smaller two lakes were dominated by margins of common reed and were evidently subject to varying water levels with some areas of the grassland flooded. The banks appear to have been subject to some disturbance/re-profiling with some areas being sparsely vegetated comprising ephemeral habitats and areas of bare ground and spoil piles.
- 3.2.37. A small area of standing water with some limited aquatic habitats and shallow banks was also recorded within the low-lying areas of the Lake Zone to the west of the Lakes.
- 3.2.38. Four arable field ponds were present within the Core Zone; two to the northern extent close to Manor Road and a further two south of the Core Zone close to Broadmead Farm, these are small waterbodies surrounded by scrub or woodland. One of the ponds was also dominated by great reedmace (*Typha latifolia*).
- 3.2.39. Lastly, a single pond has been identified immediately west of the A421 within an area that could not be fully accessed, as it is fenced. This appears to be a drainage function pond. associated with the road network or the industrial development located in this area and is dominated by common reed and common bulrush (*Typha* sp.) with scattered scrub surrounding.
- 3.2.40. Further details of the waterbodies present within the Site are outlined in **Appendix 6.2: Aquatic Habitat Scoping Assessment (Volume 3)**.

Rivers and Streams – r2

- 3.2.41. Watercourses, including sections of field drain were present along the boundaries of arable fields and bordering roads. There were 14 watercourses within the Lake Zone, Core Zone and West Gateway Zone, the majority of which were drainage ditches. The main watercourses present include Elstow Brook, a tributary of the River Great Ouse, which crosses through the West Gateway Zone, flowing under Manor Road, and then follows the line of Marston Vale Railway Line along the western boundary of the Lake Zone. The total length of the watercourse within the Site is approximately 1.9km (**Plate 0-13 in Annex 3**). The Brook has been subject to management with re-profiled banks and limited emergent vegetation within the more channelised section to the west of the Lake Zone. A mature corridor of young woodland and scrub was present along most of its length alongside the Lake Zone. The section running through the West Gateway Zone is open with grassland banks and occasional trees.
- 3.2.42. Drainage ditches including a more prominent section traversing across the northeast of the Core Zone were present. This watercourse: termed as the 'Core Zone Watercourse' was approximately 1.5m in width, with variable areas of standing/slow flowing water evident. The watercourse has steep banks and is vegetated by a hedgerow and scattered scrub on the eastern bank.
- 3.2.43. Species recorded within the watercourses included common reed, great reedmace, water mint (*Mentha aquatica*), common nettle, hemlock and hedge bedstraw.
- 3.2.44. Further details of the watercourses present within the Site are outlined in **Appendix 6.2: Aquatic Habitat Scoping Assessment (Volume 3)**.

Open Mosaic Habitats on Previously Developed Land – secondary code 80

- 3.2.45. Of the habitats included above a total of 3.28ha were classified with the secondary code open mosaic habitats on previously developed land which is an HPI. This habitat type must meet five criteria. It must be an open mosaic habitat ≥ 0.25 ha in size, have a known history of disturbance, contain vegetation comprising early successional communities, consisting mainly of stress-tolerant species e.g. lichens, open grassland and annuals and contain unvegetated, loose bare substrate. Also, the Site must show spatial variation within 0.25ha, forming a mosaic of ≥ 1 early successional communities plus bare substrate.
- 3.2.46. The area of this HPI was present towards the south of the Lake Zone within an area which has formerly been developed land associated with the brick works. It had previously been disturbed which had resulted in a mosaic of other acid grassland, mixed scrub and other broadleaved woodland habitats with areas of bare substrate and local variation in the plant species present. The other acid grassland had a high abundance of lichens within the sward and the ground flora of the other broadleaved woodland was dominated by lichens.

3.3 PROTECTED AND NOTABLE SPECIES ASSESSMENT

- 3.3.1. The potential for the Field Survey Area to support legally protected species and notable species has been assessed using the results of the desk study and observations made during the field survey within the Field Survey Area. Desk study records have only been considered below if they are recent (from the last 10 years) and/or if they relate to species that may be supported by habitats or features which are likely to be present within the Field Survey Area. Habitats present within the Field Survey Area were suitable in principle to support the following species/species groups: Bats;

- Badger;
- Water vole;
- Otter;
- Birds (breeding and wintering);
- Reptiles;
- Amphibians;
- Invertebrates (terrestrial and aquatic); and
- Non-native invasive plant species.

3.3.2. Further consideration is given below to the likelihood for these species to be present within the Field Survey Area.

3.3.3. Whilst there are no records of hazel dormice (*Muscardinus avellanarius*), there are known populations located beyond the desk study area in Bedfordshire (including at Maulden Woods (located approximately 5.5km southeast of the Site)²². A check of planning applications and their accompanying ecological information for the cumulative impact assessment revealed no reported evidence of hazel dormouse (e.g. Environmental Impact Assessment- Wixams Northern Expansion Area, Bedford Borough Council Planning Reference 15/00466/EIA²³). In addition, a Site check for EPS mitigation licences granted within 10km of the Site²⁴, returned no EPS mitigation licences for dormice.

3.3.4. Information published by Bedfordshire and Luton Biodiversity Monitoring and Recording Centre states that:

“In Bedfordshire populations are now seriously fragmented and dormouse are thought to be found in only three main areas – Studham/Whipsnade, Pegsdon/Sharepenhoe and Mauldon.”²⁵

3.3.5. It is considered highly unlikely that hazel dormouse is present in land in or around the Proposed Development.

3.3.6. The Field Survey Area is located outside the natural distribution or did not provide suitable habitat for other protected or notable species not specifically discussed in this PEA. Other species or groups of species besides those outlined above, are by default not considered further in this PEA.

²² Bedfordshire and Luton Biodiversity Partnership (2010) *Bedfordshire and Luton Species Action Plan: Hazel Dormouse*. Available at: <https://www.bedscape.org.uk/BRMC/newsite/docs/bedslife/bap%20plans/SAP%202006%20dormouse.pdf> [Accessed: 24 March 2025].

²³ Bedford Borough Council (n.d.) *Planning – Application Summary: 15/00466/EIA*. Available at: <https://publicaccess.bedford.gov.uk/online-applications/applicationDetails.do?activeTab=summary&keyVal=NKN5QICU03200> [Accessed: 24 March 2025].

²⁴ Completed on the MAGIC portal¹²

²⁵ Bedfordshire and Luton Biodiversity Partnership (n.d.) *Working Around Dormice – Information for Planners and Practitioners*. Available at: <https://www.bedscape.org.uk/BRMC/newsite/docs/bedslife/factsheets/working%20with%20dormice.pdf> [Accessed: 24 March 2025].

BATS

Roosting Bats

- 3.3.7. The data search identified two bat roosts records from within 2km of the Site. The closest was a soprano pipistrelle (*Pipistrellus pygmaeus*) roost which was recorded within a building approximately 1.10km west of the Site in 2015. The other was a common pipistrelle (*Pipistrellus pipistrellus*) roost recorded within the same area of buildings approximately 1.19km west of the Site in 2015.
- 3.3.8. Individual trees with potential suitable roosting habitat for bats were incidentally recorded during the survey on or adjacent to the Lake Zone, Core Zone and West Gateway Zone, in line with *Bat Conservation Trust (BCT) Guidelines*²⁶, although a full GLTA was not undertaken. Further trees suitable to support roosting bats are likely to be present within the wider Site in scrub, woodland and lines of trees throughout the Field Survey Area, these will be subject to a full GLTA and subsequent roost characterisation surveys to inform the EclA where required. Trees with potential to support roosting bats subsequently identified by GLTA surveys are outlined within **Appendix 6.10: Bat Roost Appraisal Report (Volume 3)**.
- 3.3.9. A bricked single storey derelict building (the former brickworks guardhouse) was present at the southern entrance to the Lake Zone off Manor Road which was identified as having potential suitability for roosting bats (**Plate 0-14 in Annex 3**). This has been subject to a full PRA and subsequent roost characterisation surveys as required to inform the EclA (**Appendix 6.10: Bat Roost Appraisal Report (Volume 3)**).

Foraging and Commuting Bats

- 3.3.10. The data search returned records of five bat species, including common pipistrelle, Daubenton's bat (*Myotis daubentonii*), Natterer's bat (*Myotis nattereri*), noctule (*Nyctalus noctule*), and soprano pipistrelle.
- 3.3.11. Based upon an initial higher-level appraisal of the potential suitability of the Site for non-roosting bats i.e. foraging and commuting, given the habitats present within the Site it would be reasonable to assign at least a Moderate suitability category (as per Table 4.1 of the BCT guidelines²⁶). The Site includes suitable linear bat habitat features including ditches, hedgerows and tree corridor associated with Elstow Brook and scrub and tree lines alongside the railway lines. These features have moderate connectivity to the wider landscape but would be measured by the presence of historic and recent surrounding landscape features of residential and industrial development and several roads i.e. the A421 to the north and west of the Site. The lakes, scrub and woodland within the Site, particularly where a mosaic and away from light sources in the Lake Zone are considered likely to provide Moderate to High suitability for foraging bats.

²⁶ Bat Conservation Trust (2023) *Bat Surveys for Professional Ecologists: Good Practice Guidelines, Fourth Edition*. Available at: https://cdn.bats.org.uk/uploads/pdf/Resources/For-professionals/Bat-Survey-Guidelines-4th-edition-AMENDED-27.03.24.pdf?v=1711530492&_gl=1*1kf5pnt*_ga*MTc4NzQzNDA3NS4xNzI4OTAzMjA1*_ga_G28378TB9V*MTczMDk4NDA0OS40LjAuMTczMDk4NDA0OS4wLjAuMA. [Accessed: 24 March 2025].

BADGER

- 3.3.12. The data search returned 16 records of badger (*Meles meles*). The closest records of badger were a sett along the bank of a waterbody within the Lake Zone and one record within the Site to the west, as a road traffic casualty on the A421. Details of badger records are redacted in public-facing versions of this document. Badger survey results will be provided to appropriate stakeholders including but not limited to Natural England via separate confidential reporting.
- 3.3.13. Suitable foraging and sett building habitat for badger was present within the Site including within arable field margins, scrub, woodland, banks of watercourses and hedgerow margins. Three potential badger setts were recorded within the West Gateway Zone (for further details see **Annex 3**).
- 3.3.14. An active main sett was recorded within the Lake Zone comprising several entrances with fresh spoil and a badger hair being recorded outside one of the entrances (**TN3, Annex 4**). Active setts have also been recorded in the West Gateway Zone.

WATER VOLE AND OTTER

- 3.3.15. The data search returned no records of water vole (*Arvicola amphibius*) within the desk study area.
- 3.3.16. A total of 14 records of otter (*Lutra lutra*) were provided from within the desk study area. The closest record of otter was from a location approximately 0.2km west of the Lake Zone in 2018, along the watercourse that runs south through the West Gateway Zone.
- 3.3.17. Multiple watercourses and waterbodies were present throughout the Site (as shown in **Annex 3**). A total of 14 watercourses were recorded along arable field margins within the Lake Zone, Core Zone and West Gateway Zone which had suitability to support otter and water vole. In addition, 11 waterbodies were recorded within the Lake Zone and West Gateway Zone which had suitability for otter and water vole. Many of these waterbodies and watercourses had steep banks with emergent vegetation present. Some were also neighboured by mature trees which could provide suitable holt building habitat for otter.
- 3.3.18. A further nine watercourses and one waterbody have been identified within the areas bordering the Site from review of online aerial and OS mapping. These may also be suitable to support otter and water vole. Many of the ditches seemed to be connected to a network of other ditches, with some also being connected to the Great River Ouse CWS. These watercourses were generally located bordering roads (**Annex 3**). Further details of the status of otter and water vole within the Site are outlined in **Appendix 6.11: Otter and Water Vole Survey Report (Volume 3)**, subsequently prepared following completion of species specific surveys in 2024.

BIRDS

- 3.3.19. Within 2km of the Site, over 52,000 records of birds were provided by the desk study sources. The large number of records were generally attributed to the various CWS and lagoon sites located within the desk study area. Particularly, as Quest Pit CWS which is 0.62km east of the Site was designated for being an important habitat for a range of rare bird species. These records were reviewed and have been summarised to those species which are considered of greatest conservation concern e.g. those listed under *Schedule 1* of the *WCA*⁴, Red listed and Species of Principal Importance (SPI) species as presented in **Table 3-4**.

- 3.3.20. The Site contained multiple habitat types suitable for nesting birds, including trees, woodland, and scrub. Grassland and arable land suitable for ground nesting bird species was also present, along with watercourses which had potential to provide habitat for species such as kingfisher.

Table 3-4 – Summary of bird records for Kempston Hardwick Pit CWS and Coronation Pit CWS

Kempston Hardwick Pit CWS			Coronation Pit CWS		
Schedule 1	Red List	SPI	Sch 1	Red List	SPI
Black tern (<i>Chlidonias niger</i>)	Black-tailed godwit	Common scoter	Bearded Tit (<i>Panurus biarmicus</i>)	Black-tailed godwit	Cuckoo
Black-tailed godwit (<i>Limosa limosa</i>)	Common scoter	Cuckoo	Bittern (<i>Botaurus stellaris</i>)	Cuckoo	Grasshopper warbler
Cetti's warbler (<i>Cettia cetti</i>)	Cuckoo (<i>Cuculus canorus</i>)	Curlew	Black-tailed godwit	Fieldfare	Grey partridge
Common scoter (<i>Melanitta nigra</i>)	Curlew (<i>Numenius arquata</i>)	European white-fronted goose (<i>Anser albifrons albifrons.</i>)	Cetti's warbler	Grasshopper warbler	House sparrow
Fieldfare (<i>Turdus pilaris</i>)	Dunlin (<i>Calidris alpina</i>)	Grasshopper warbler	Fieldfare	Greenfinch	Lesser redpoll
Garganey (<i>Spatula querquedula</i>)	Fieldfare	Grey partridge	Garganey	Grey partridge	(<i>Acanthis cabaret</i>)
Great northern diver (<i>Gavia immer</i>)	Grasshopper warbler (<i>Locustella naevia</i>)	Reed bunting (<i>Emberiza schoeniclus</i>)	Green sandpiper	Herring gull	Reed bunting
Green sandpiper (<i>Tringa ochropus</i>)	Greenfinch (<i>Chloris chloris</i>)	Ring Ouzel	Hobby	House martin	Skylark
Greenshank (<i>Tringa nebularia</i>)	Grey partridge (<i>Perdix perdix</i>)	Scaup	Kingfisher	House sparrow (<i>Passer domesticus</i>)	Turtle dove
Hobby (<i>Falco Subbuteo</i>)	Herring gull	Skylark	Marsh harrier	Lapwing	Yellow wagtail
Kingfisher (<i>Alcedo atthis</i>)	House martin (<i>Delichon urbicum</i>)	Yellowhammer	Red kite	Linnet	Yellowhammer
Little ringed plover	Lapwing (<i>Vanellus vanellus</i>)		Redwing	Mistle thrush (<i>Turdus viscivorus</i>)	
Marsh harrier (<i>Circus aeruginosus</i>)	Linnet (<i>Linaria cannabina</i>)			Nightingale	
Mediterranean gull (<i>Ichthyaeetus melanocephalus</i>)	Nightingale (<i>Luscinia megarhynchos</i>)			Pochard	
Peregrine (<i>Falco peregrinus</i>)	Pochard (<i>Aythya farina</i>)			Skylark	
				Starling	
				Swift	
				Turtle dove (<i>Streptopelia turtur</i>)	
				Woodcock	
				Yellow wagtail	
				Yellowhammer	

Kempston Hardwick Pit CWS			Coronation Pit CWS		
Schedule 1	Red List	SPI	Sch 1	Red List	SPI
Red kite (<i>Milvus milvus</i>) Redwing (<i>Turdus iliacus</i>) Ruff (<i>Calidris pugnax</i>) Scaup (<i>Aythya marila</i>) Tundra swan (<i>Cygnus columbianus</i>) Whooper swan (<i>Cygnus cygnus</i>) Wood sandpiper (<i>Tringa glareola</i>)	Ring ouzel (<i>Turdus torquatus</i>) Ringed plover Ruff Scaup Skylark (<i>Alauda arvensis</i>) Starling (<i>Sturnus vulgaris</i>) Swift (<i>Apus apus</i>) Tundra swan Whinchat (<i>Saxicola rubetra</i>) White-fronted goose (<i>Anser albifrons</i>) Woodcock (<i>Scolopax rusticola</i>) Yellow wagtail (<i>Motacilla flava</i>) Yellowhammer (<i>Emberiza citrinella</i>)				

REPTILES

- 3.3.32. In total, 36 records of reptiles were returned by the data search, 19 of which were attributed to grass snake (*Natrix helvetica*) and 17 of which were common lizard (*Zootoca vivipara*). The closest reptile record was of an adult common lizard approximately 0.26km east of the Site.
- 3.3.33. There was suitable habitat to provide foraging (watercourses/lakes adjacent to the Site) and refuge for grass snake, particularly in grassland close to the various watercourses and scrub within the Site. Additionally, there was suitable habitat for slow worm (*Anguis fragilis*) and common lizard (*Zootoca vivipara*) within the grassland habitats as well as the margins of the hedgerows and lines of trees, although this was less well connected.
- 3.3.34. Dead logs and wood in the understorey of woodland and piles of rubble within the Lake Zone provided suitable resting places and hibernacula for reptiles. Further details of the status of reptiles within the Site is outlined in the subsequently prepared **Appendix 6.12: Reptile Survey Report (Volume 3)**, providing results of the reptile surveys undertaken in 2024.

AMPHIBIANS

Great Crested Newt

- 3.3.35. The desk study has confirmed that the desk study area is of importance for great crested newt (GCN) (*Triturus cristatus*) with confirmed and recent records provided. Bedfordshire is a known stronghold for this species. A total of 165 records of GCN were provided by the data search, generally associated with waterbodies in the desk study area. A total of five records of GCN presence were returned from within the Site, generally associated with ponds. A total of 18 European Protected Species Mitigation Licences for GCN were recorded within the 2km desk study area, 11 of which are located within a 500m radius of the Site. The closest licence record was from a location approximately 80m east of the Site in scrub neighbouring the railway line.
- 3.3.36. Great crested newt environmental DNA (eDNA) surveys have been completed of waterbodies within and up to 250m. These surveys were completed in June 2024, with 17 waterbodies subject to survey. Land access constraints meant not all water bodies within 250m of the Site could be surveyed. In addition, survey results from eight waterbodies were 'indeterminate', i.e. no reliable result could be obtained.
- 3.3.37. Of the remaining ponds that were surveyed, three were negative for GCN eDNA and seven were positive for great crested newt eDNA. One of the negative ponds (Pond 26) was subject to significant access limitations during survey. The 'negative' survey result obtained for this pond is therefore not considered to be reliable and is treated as 'indeterminate', i.e. it is possible GCN use this pond.
- 3.3.38. The positive waterbodies were Ponds 1, 5, 6, 21, 23, 25, and 34. The locations of waterbodies are shown in the **Appendix 6.7: Great Crested Newt Survey Report (Volume 3)**. The ponds with positive eDNA results were located in the south of the Core Zone (and within 250m south of it) and in the far north of the Core Zone and south of the Lake Zone, either side of Manor Road.
- 3.3.39. There was suitable terrestrial habitat to support GCN within the Site and within 250m of the waterbodies present locally. This habitat included all uncultivated habitats including hedgerows, grassland, scrub and lowland mixed deciduous woodland.

Other Notable Amphibians

- 3.3.40. The desk study also returned 20 records of common toad (*Bufo bufo*). The closest record was from within the grassland areas within the Lake Zone.
- 3.3.41. Suitable aquatic and terrestrial habitat for common toad was also present throughout the Site and toad has been recorded incidentally in the Lake Zone during other ecology surveys in spring 2024.

INVERTEBRATES

- 3.3.42. There were records of 43 species of invertebrates that are currently protected under Section 41 of the *NERC Act 2006*²⁷ returned by the data search, including dingy skipper (*Erynnis tages*). The Site is also within a B-Line nature reserve²⁷. B-Lines are an informal conservation policy which aim to link existing wildlife areas, creating a network across the UK.
- 3.3.43. The mosaic of habitats including the grassland, waterbodies, woodland, scrub and previously disturbed ground within the Lake Zone provide ideal opportunities for a range of invertebrate species. In particular, open mosaic habitats on previously developed land offered a complex habitat structure with a range of micro-habitats which were likely to support invertebrate communities of conservation importance.

NON-NATIVE INVASIVE PLANT SPECIES

- 3.3.44. The desk study did not highlight the known presence of records of non-native invasive species listed under Schedule 9 of the *WCA*⁴. There was one record of Japanese knotweed (*Reynoutria japonica*) recorded within the grass verge south of Manor Road (**Annex 3**). No other incidental sightings of non-native invasive plant species were identified during the habitat survey; however, this is not evidence of the absence of non-native invasive plant species as it was not the focus of the PEA. Given the location and nature of the Site it is possible non-native invasive plants may be present.

²⁷ Buglife (2023) *B-Lines*. Available at: <https://www.buglife.org.uk/our-work/b-lines/> [Accessed: 24 March 2025].

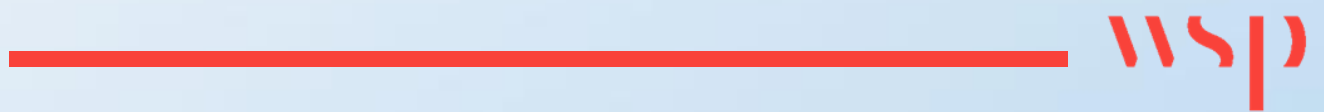
4 CONCLUSION

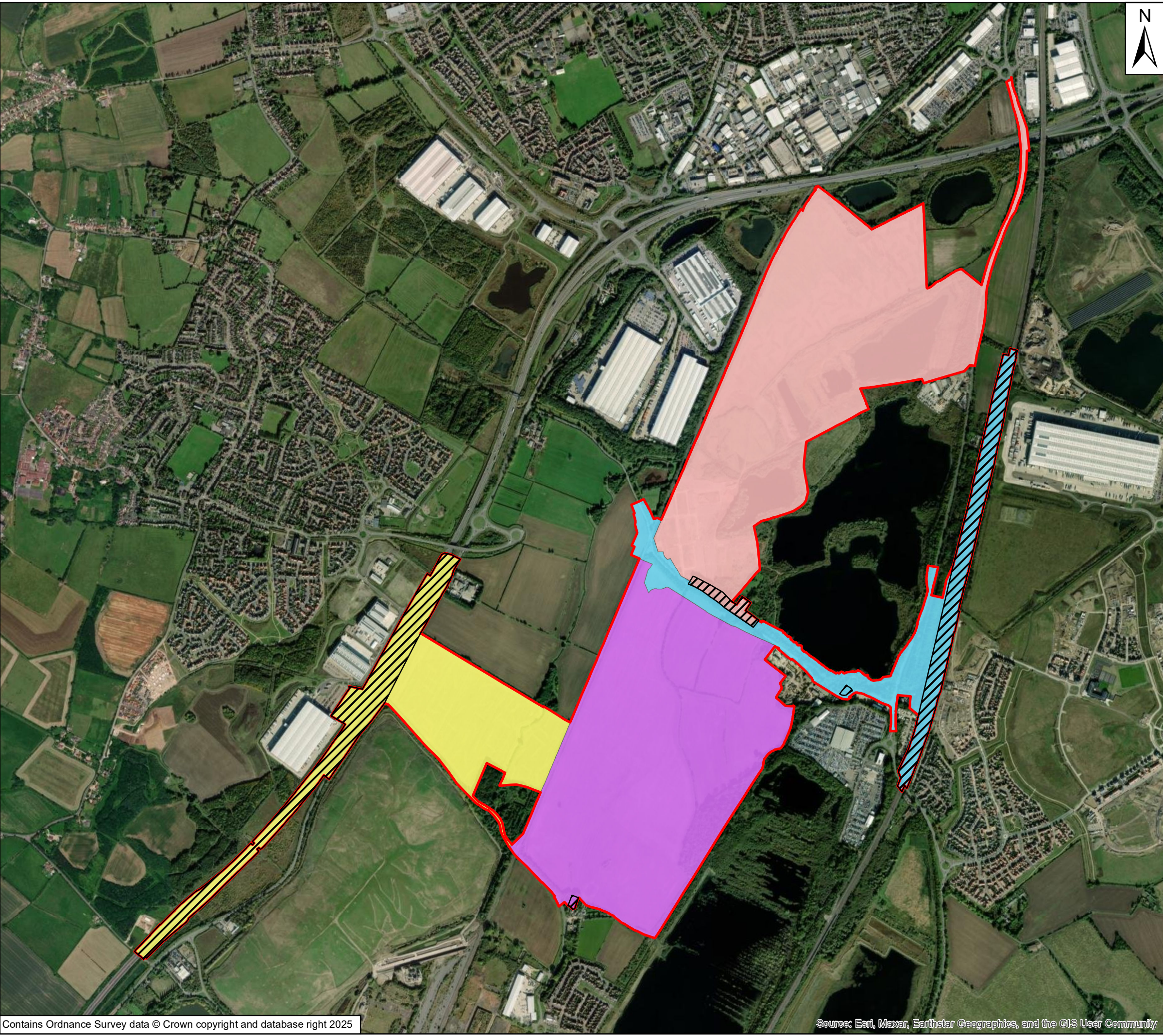
- 4.1.1. This PEA is based on a desk study and ecological survey undertaken in within period January to June 2024, to assess the ecological constraints within the Site. The Site, particularly the Lake Zone, has several habitat features which indicate that it would support habitats and species of ecological interest, or which are likely to do so (further survey data will be required to confirm).
- 4.1.2. Habitats with biodiversity value on-Site that may be impacted by the Proposed Development include trees, woodland, open mosaic habitats on previously developed land, reedbeds, hedgerows, watercourses and waterbodies. Of these habitats, lowland mixed deciduous woodland, hedgerows, open mosaic habitats on previously developed land and reedbeds are HPI. An EclA has been completed to assess the potential effects upon habitats and outline mitigation measures to address these predicted effects and is provided in **Chapter 6: Ecology and Nature Conservation (Volume 1)**.

Habitats present within and adjacent to the Site could support a range of protected and notable species. These are roosting, commuting and foraging bats, badger, water vole, otter, breeding and wintering birds including Schedule 1 of the WCA⁴ and red list/SPI species, reptiles, invertebrates and GCN and other amphibians. As noted above, an assessment of the potential effects of the Proposed Development upon important ecological species or species groups has been undertaken in the EclA provided as **Chapter 6: Ecology and Nature Conservation (Volume 1)**.

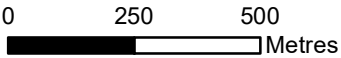
Annex 1

FIGURE





- Legend
- Site boundary
 - Core Zone
 - East Gateway Zone
 - Lake Zone
 - West Gateway Zone
 - Inaccessible areas of site



Client:	Universal Destinations & Experiences		
Project:	Universal Destinations & Experiences UK Project		
Title	Figure 1 - Site Boundary and Access Restricted Areas on Site		
Drawing No:	Layers	Drawn:	SS
Date:	19/05/2025	Checked:	CM
Scale:	15,000 @ A3	Approved:	SB

Annex 2

PLANT SPECIES LIST

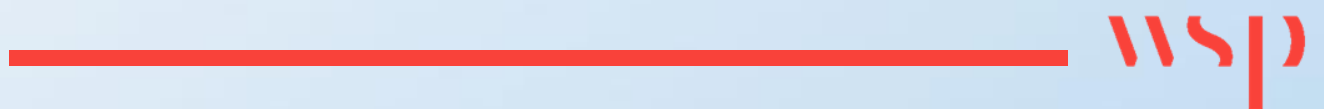


Table 0-1 - Indicative plant species recorded within the Site

Common Name	Scientific Name	Frequency (DAFOR)
Common ash	<i>Fraxinus excelsior</i>	D
Common hazel	<i>Corylus avellana</i>	D
Cock's-foot	<i>Dactylis glomerata</i>	A
False oat-grass	<i>Arrhenatherum elatius</i>	A
Common couch	<i>Elytrigia repens</i>	A
Common hawthorn	<i>Crataegus monogyna</i>	A
Blackthorn	<i>Prunus spinosa</i>	A
Elder	<i>Sambucus nigra</i>	A
Elm	<i>Ulmus sp.</i>	A
Common reed	<i>Phragmites australis</i>	A
Cleavers	<i>Galium aparine</i>	F
Reed sweet-grass	<i>Glyceria maxima</i>	F
Silver birch	<i>Betula pendula</i>	O
Field maple	<i>Acer campestre</i>	O
Scots pine	<i>Pinus sylvestris</i>	O
Spindle	<i>Euonymus europaeus</i>	O
Dogwood	<i>Cornus sanguinea</i>	O
Norway maple	<i>Acer platanoides</i>	O
Oak	<i>Quercus robur</i>	O
Bramble	<i>Rubus fruticosus</i>	O
Dog rose	<i>Rosa canina</i>	O
Spiny retharrow	<i>Ononis spinosa</i>	O
Wild cherry	<i>Prunus avium</i>	O
Sycamore	<i>Acer pseudoplatanus</i>	O
Common ivy	<i>Hedera helix</i>	O
Ground ivy	<i>Glechoma hederacea</i>	O

Common Name	Scientific Name	Frequency (DAFOR)
Creeping cinquefoil	<i>Potentilla reptans</i>	O
Water mint	<i>Mentha aquatica</i>	O
Small teasel	<i>Dipsacus pilosus</i>	R
Lords-and-ladies	<i>Arum maculatum</i>	R

Annex 3

INDICATIVE SITE PHOTOGRAPHS

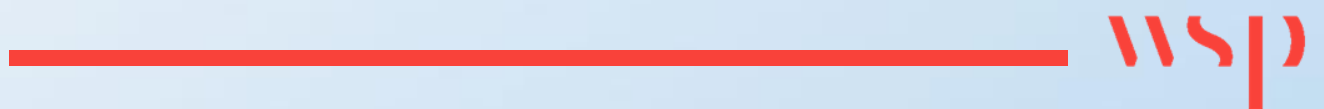




Plate 0-1 – Other lowland acid grassland and other lowland mixed deciduous woodland near the northeastern boundary of the Lake Zone



Plate 0-2 – Other neutral grassland within the Lake Zone



Plate 0-3 – Modified grassland, mown, surrounding Elstow Brook running through the West Gateway Zone



Plate 0-4 – Lowland mixed deciduous woodland along the northern boundary of the Core Zone



Plate 0-5 – Other broadleaved woodland – open mosaic habitats on previously developed land towards the south of the Lake Zone



Plate 0-6 – Other woodland – mixed – adjacent to the West Gateway Zone



Plate 0-7 – Blackthorn scrub within the West Gateway Zone



Plate 0-8 – Hawthorn scrub within the West Gateway Zone



Plate 0-9 – Mixed scrub within the Lake Zone



Plate 0-10 – Reedbeds within the Lake Zone



Plate 0-11 – Typical view of cereal crop within the West Gateway Zone



Plate 0-12 – View across lakes within the Lake Zone



Plate 0-13 – Typical cross section view of Elstow Brook running through the West Gateway Zone



Plate 0-14 – Derelict bricked former guardhouse within the Lake Zone with potential suitability for roosting bats



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