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ECOLOGICAL ASSESSMENT (including initial bat) Wheat Quarter North Site ReApp

October 2020

BMD.20.019.RPE/P1.801.-.Ecology & Bat

DOCUMENT HISTORY

Project Number: 20.019		Document Reference: BMD.20.019.RPE/P1.801.-.Ecology & Bat			
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-	Planning	LM/JP	JP	JP	14.10.2020

Declaration of compliance with professional code of ethics or conduct

The information which we have prepared and provided is true and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bonafide opinions.

Every reasonable attempt has been made to comply with the relevant best practice guidelines and BS42020:2013 (Biodiversity: Code of practice for planning and development).

UK leaving the EU

Until the UK has formally completed the transition phase of leaving the EU and until the Environment Bill 2020 comes into force it is assumed that all legislation pertaining to wildlife will remain as it was prior to the transition.

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EXECUTIVE SUMMARY

Client.....	Plutus Estates
Consultant.....	Bradley Murphy Design Ltd.

SITE

Location	Wheat Quarter North Site ReApp, Hertfordshire, AL7 3BU.
National Grid Reference	Approx. centre TL24131295.
Over-view.....	The Site is a 4.23 ha largely disused, partially demolished, former Shredded Wheat factory and associated offices. Habitats on Site include areas of hardstanding, man-made earth/rubble piles, strips of amenity planting/grassland, mosaic of re-colonizing grassland, tall ruderal vegetation, scattered/continuous scrub and lines of semi-mature trees/hedgerows.
Landscape context	The site is located to the east of Welwyn Garden City centre, within a mixed industrial/residential landscape.

DEVELOPMENT & PLANNING BACKGROUND

Proposed works	The proposed works for the site is a mixed-use development, with associated access, car-parking provision and landscape planting.
Planning stage.....	Outline planning stage.

ECOLOGICAL BACKGROUND

General	BMD undertook a preliminary ecological survey and species-specific surveys of the Site between October 2013 – October 2014.
Most recent baseline	BMD undertook a walkover verification survey in September 2017.

SURVEY

Objectives	<ol style="list-style-type: none"> 1. To provide an ecological baseline, including nature conservation value, of the Site with a focus on habitats and potential for protected and notable species. Particular attention will be paid to the potential for the Site to support roosting bats. 2. To identify the need and level of more detailed species-specific surveys for a planning application. 3. To guide the initial stages of master planning and indicative mitigation required to ensure net biodiversity gain is achieved and favourable conservation status of species utilising the site as a result of the proposed development. 4. To provide specialist advice and make appropriate recommendations to ensure compliance with wildlife law and recognised best practice.
Approach.....	<p>Desk based assessment using online resources, including the <i>MAGIC</i> database, and data from the Local Biological Record Centre (Herts Environmental Records Centre).</p> <p>Habitat assessment – based on JNCC Phase 1 Habitat Survey.</p> <p>Initial assessment of structures and trees for their likelihood of supporting bat roosts.</p> <p>Evaluation of habitats based on the FEPs.</p>
Date	14 th July 2020.
Results.....	<p>The Site comprises predominately of disturbed land with ephemeral/short perennial vegetation, hardstanding and derelict factory buildings/silos. The remainder of the Site comprises of; species poor intact hedgerows, amenity grassland, species poor semi-improved grassland, tall ruderal vegetation, dense continuous scrub, semi-improved grassland, scattered trees and scrub.</p> <p>The nearest statutory and non-statutory nature conservation sites are: Sherrardspark Wood LNR & SSSI ~990 m NW, Dismantled Railway LWS ~520 m NW, Twentieth Mile Bridge Allotments LWS ~500 m S of the Site, Blackfan Valley LWS ~900 m NW.</p> <p>No Priority Habitats occur on/adjacent to the Site. The Site has the potential to support the following Protected and Notable Species: Nesting birds, especially house sparrow and peregrine falcon, hedgehogs and slow-worms (low risk).</p>
Conclusions	The development of the Site is not considered to have a negative ecological impact on the local area if best practice is followed.

RECOMMENDATIONS

No further surveys are considered necessary to inform a planning application for the current proposals.
Mature trees should be retained where possible.
Ecological mitigation includes appropriate precautionary measures and clerk of works supervision during site clearance/demolition works

Provision of bird nesting and bat roosting features should be considered for inclusion within the new building as well as invertebrate boxes.

Opportunities for enhancement include the use of appropriate native trees and shrubs any soft landscaping included within the proposals.

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1. INTRODUCTION

1.1 Background Information

1.1.1 Bradley Murphy Design (BMD) was commissioned by Plutus Estates in July 2020 to undertake an Ecological Assessment of their Site at Wheat Quarter North Site ReApp, Hertfordshire, AL7 3BU. The Site, hereafter referred to as 'the Site', is approximately centred on national grid reference: TL24131295. A plan depicting the Site's location is provided in the Appendix.

1.1.2 The following assessments were completed in July 2020:

- Desk based assessment,
- Habitat survey,
- Initial assessments of structures and trees.

1.1.3 This report presents the approach, results and evaluation of the assessments and survey undertaken at the Site in order to determine the ecological baseline and nature conservation value of the Site. Species specific ecological assessments are reported in separate documents. The data will:

- Enable the identification of the need and level of more detailed species-specific surveys where required for a successful determination of a planning application,
- Enable potential ecological constraints to the proposed development to be identified,
- Further guide the master planning to ensure that net biodiversity gain is met (an obligation of the NPPF, 2019) through design and mitigation hierarchy (avoid, mitigate, compensate).

1.2 Proposed Development

1.2.1 The proposed development for the Site is a mixed-use development, with associated access, car-parking provision and landscape planting.

1.3 Site Context

Historic Context

1.3.1 Historic maps indicate that the Site was previously an open field between the great northern railway line and Peartree Farm since at least the 1880s until the 1910s. The Site was later developed into a series of factory buildings since at least 1949 until 1969, after the founding of Welwyn garden city in 1920. Based on areal imagery the Site has remained a series of factories and silos since at least 2000 until 2017. After 2017 large extents of the factories were demolished to make room for redevelopment. Little else has changed on the Site from 2017 until present day aside from the maturing of vegetation.

Present Context

1.3.2 The site is located approximately 350m to the east of Welwyn Garden City centre, within a mixed industrial/residential landscape. Bridge Road (B195) is situated adjacent to the northern boundary of the Site with industrial units beyond. Situated immediately to the east of the site is Broadwater Road (A1000)

with offices beyond. To the west is a railway-line and Welwyn Garden City railway station with a shopping centre beyond. To the south lies land scheduled for redevelopment with residential apartments beyond.

- 1.3.3 The Site is approximately 4.23 ha in area and is now largely disused. It is dominated by former commercial buildings in the south/centre of the Site (the former Shredded Wheat factory and associated offices). Habitats of recent origin have colonised areas of hardstanding and man-made earth/rubble piles to the east of the Site. Associated with these habitats are small strips of currently unmanaged amenity planting and amenity grassland. Within the western section of the site is an area comprising of a mosaic of hardstanding grassland, re-colonizing grassland, tall ruderal vegetation and scattered and continuous scrub, which in turn is bordered by an embankment to the north that supports shrubs, ruderal vegetation and a line of semi-mature trees.

1.4 Ecological Context

- 1.4.1 Previous surveys undertaken by BMD between 2013 to 2017 are as follows:

- Preliminary Ecological Survey – October 2013
- Badger Survey – October 2013 and update October 2014
- Bat Surveys (Trees and Buildings) – October and November 2013
- Reptile Survey – April to June 2014
- Botanical Survey – June and August 2014
- Reptile Translocation – August to October 2014
- Walkover Verification Survey – September 2017

- 1.4.2 An ecological survey and assessment was carried out by BMD in 2015. Relevant conclusions from this ecological assessment are listed below:

- ‘Japanese Knotweed, Rhododendron and Cotoneaster sp. (including Wall Cotoneaster) are present within the Site. Therefore, in order to avoid a potential offence under Schedule 9 during ground clearance /earthworks a number of recommendations for the eradication of these species from the site as part of the proposals are detailed within this report, with a chemical treatment programme for Japanese Knotweed currently on-going at the site.’
- ‘The vast majority of the Site provides only limited opportunities to protected faunal species. Nevertheless, the northern embankment, north-western habitat mosaic, and the south-western boundary habitats do provide some opportunities for bats, birds, common mammals, reptiles and invertebrates. Therefore, mitigation measures /precautionary safeguards are detailed at Section 6 of this report regarding the presence /potential presence of these species, where appropriate.’
- ‘A single pair of Peregrine Falcon was recorded nesting at the Site during the spring 2014 survey work undertaken. As such, a mitigation strategy has been drafted to provide alternative nesting habitat for this species at the site during the development works, whilst it is proposed that a purpose-built nesting platform be incorporated into the proposals to provide optimal nesting opportunities for this species at the site in the long-term.’
- ‘A small population of reptiles (Slow-worm) was recorded at the Site during the spring 2014 survey work undertaken. As per best practice guidance, the vast majority of this population has been

translocated outside of the development footprint, with reptile exclusion fencing installed to prevent re-colonization of this habitat. As such, it is considered that 'reasonable measures' have been completed in order to safeguard this species at the site.'

1.4.3 A walkover verification survey was carried out by BMD on the 1st September 2017. Relevant conclusions from this ecological assessment are listed below:

- 'The 2015 conclusions in relation to desk study data are considered to remain valid. Since the site lies within an Impact Risk Zone for two SSSIs, it is highly likely that the LPA will need to consult with Natural England as part of the planning process.'
- 'There were some changes to the habitats present on site since the 2013/14 surveys. These changes predominantly include a shift in the grassland habitats (which have been unmanaged) and to the habitats in the north-west (resulting from the construction of a new access road along the north-west boundary).'
- 'There were no significant changes to the results of the 2015 assessment in relation to species. However, since the 2014 reptile translocation work, and the construction of the access road, the habitat where the majority of slow-worm were captured has changed significantly: The access road now separates the railway corridor from the former north-west grassland / ruderal / scrub mosaic. The north-west area now only offers sub-optimal habitat for reptiles.'

Bat roosts and species overview

1.4.4 Different species of bat have different roosting preferences. Table 1.1 provides a summary of bats that have potential to occur on Site and the roost locations they are typically associated with.

Table 1.1 Summary of roosting opportunities on Site important to different bat species that have potential to occur on Site based on their geographical range (adapted from Collins, 2016)

Bat species	Summer roosts				Winter roosts			
	Trees	House/ buildings	Barn-type buildings	Bat boxes	Caves/ mines	Buildings	Walls/ cavity	Trees
Barbastelle								
Brown-long-eared								
Common/ soprano pipistrelle								
Daubenton's								
Leisler's								
Nathusius' pipistrelle								
Natterer's								
Noctule								
Serotine								
Whiskered								

Notes		Primary locations
		Secondary locations, i.e. only sometimes found in such locations

Relevant planning applications

1.4.5 The Site has planning approval under two applications:

- N6/2015/0294/PP: Former Shredded Wheat Factory, Bridge Road, Welwyn Garden City, AL8 6UN. Outline planning permission for part demolition, repair, restoration, extension and conversion of the former Shredded Wheat Factory complex to include demolition of all buildings and structures except the original 1920's silos, production hall, grain store and boiler house. Refurbishment and change of use of the retained listed buildings to provide 2 class C3 residential units, a class C1 boutique/budget hotel, class B1(a) offices, a class A4 pub/bar, a class D1 crèche and a class D2 Gym/dance/exercise studio. Erection of up to 850 class C3 Dwellings to potentially include up to 80 class C2 (and/or C3 Assisted living units), class A1 retail, class A3/A4 restaurants/café/bars/pubs, class D1 community use and healthcare and class D2 gym/dance/exercise studio floorspace. Provision of external space for leisure and recreation to include a linear park, external games/play area, allotments and a skate park. Creation of internal estate roads, paths, vehicle and cycle parking. Associated highway works comprising the widening of footways and the provision of cycle ways to Broadwater Road and Bridge Road, works to Hydeway, junction remodelling works and the erection of a new footbridge from Bridge Road. Phase 1 (blocks 2,3,4,5,6 & 7 on land to the north and West of Hydeway and northern part of block 1) – includes appearance, means of access, landscaping, layout and scale in addition to all associated highway works. Phase 2 (blocks 8,9,10,11 & 12 and southern part of block 1 on land to the south of Hydeway) – includes means of access with layout, scale, appearance and landscaping reserved.
- N6/2015/0293/LB: former Shredded Wheat Factory, Bridge Road, Welwyn Garden City, AL8 6UN Part demolition, repair, restoration, extension and conversion of the former Shredded Wheat Factory complex to include demolition of all buildings and structures except the original 1920's silos, production hall, grain store and boiler house. Refurbishment and change of use of the retained listed buildings to provide 2 class C3 residential units, a class C1 boutique/budget hotel, class B1(a) offices, A class A4 pub/bar, a class D1 crèche and a class D2 gym/dance/exercise studio.

1.5 Compliance with Policy, Guidance and Legislation

1.5.1 A summary of national planning policy and wildlife legislation relating to development projects in England is provided in Appendix A. The protocols, evaluations and recommendations contained within this report were made in accordance with these policies and legislation.

2. APPROACH

2.1 Introduction

2.1.1 This report has been produced with reference to current guidelines for ecological and bat assessments (e.g. CIEEM, 2017 and 2017a, Collins, 2016) although adapted to be appropriate for the conditions on Site. Reference was also made to BS42020:2013: Biodiversity – Code of Practice for Planning and Development. The assessment comprised the following:

- Desk study (including a review of previous ecological reports and significant planning applications in the area),
- Extended Phase 1 Habitat Survey,
- Initial bat scoping assessment:
 - A habitat assessment of the Site and immediate environs,
 - Initial assessment of buildings and trees for their potential to support roosting bats.

2.1.2 Table 2.1 summarises the geographical extent of the study.

Table 2.1 Geographical extent of study

Element	Study area
Desk study	1 – 5 km. See Table 2.2 for specific details
Detailed Extended Phase 1 Habitat Survey	Site boundary
Local site context (broad habitat types)	Approx. 50 m from Site boundary (identified from within Site only)

2.1.3 Full survey methodologies are provided in Appendix B and summarised below. Details of dates, surveyors, weather conditions and a review of survey limitations are provided in Appendix C. Definitions of technical terms used in this report are provided in the Glossary in Section 8. Common names of species are used throughout the report with scientific names provided in Section 8.3.

2.2 Desk Study

2.2.1 The desk study involved gathering and analysing existing ecological focused data within the Site boundary and extending up to 5 km. The results of the desk study aid in the interpretation of the survey results. Table 2.2 provides a summary of the data and their sources reviewed in the desk study.

2.3 Extended Phase 1 Habitat Survey

2.3.1 An Extended Phase 1 Habitat Survey was undertaken at the Site in accordance with industry standards (JNCC, 2010) and best practice guidance although adapted to be appropriate to the Site.

Table 2.2 Desk study data sources

Data ¹	Search area	Source ²	Justification of search area
Species			
Protected & Notable Species	1 km	A, B, E, F, G, H	Generally, the Site has limited potential to support protected and notable species with limited linkages into the wider surrounds. Area is extended to 5 km for bats as some bat species utilise a number of roosts and cover larger distances in a single night when foraging.
European Protected Species Licence Applications (excl. bats)	1 km	B	The Site has the potential to support very few European Protected Species and is poorly linked to the wider surrounds. There are no ponds within 250 m of the Site and as such, in conjunction with the dense urban setting, it is considered unlikely that great crested newts would be an important consideration.
European Protected Species Licence Applications (bats)	2 km	B	There is potential that the site supports features that may be used by bat species and that would be lost through the works. Bats can travel a number of kilometres from their roosts in a single night to forage. A wider search area provides an indication of the potential value the site may have for foraging bats based on known roosts that have been affected by other development in the area.
Non-native Invasive Species	1 km	A, F	As protected and notable species above.
Habitats			
UK Priority Habitats	1 km	B	The Site is anticipated to have limited ecological value being within an urban-central setting and has poor ecological linkages to the wider surrounds due to the extensive presence of existing urban development.
Ancient Woodland	1 km	B	
Other notable habitats	1 km	A, B, D	
Change over time/landscape context	1 km	C	To provide an indication of ecosystem connectivity into the wider landscape and subsequent movement of protected and notable species.
Sites			
Statutory Protected Sites	2 km	B	To assess whether any SSSI/SACs are likely to be impacted upon by the works.
Non-statutory Protected Sites (e.g. LWS)	1 km	A	As habitats above.
Statutory Protected Sites – Impact Risk Zones	Site	B	To assess whether any SSSI/SACs are likely to be impacted upon by the works.
Notes ¹ See glossary for definitions and species and habitats considered. ² A. Local Biological Records Centre: Herts Environmental Records Centre. B. <i>MAGIC</i> (Multi-Agency Geographic Information for the Countryside) [accessed 15/07/2020]. C. Readily available aerial images and current/historic map sources D. Woodland Trust Ancient Tree Inventory E. Natural England Class Licence database [downloaded February 2020] F. PTES The Big Hedgehog Map [accessed: 15/07/2020] G. Natural England District Licencing data resource database [downloaded February 2020] H. Special interest groups: HMBG – Bat Group			

2.4 Initial Bat Scoping Assessment

- 2.4.1 The Site was assessed for habitats and features that are required to support bats throughout their seasonal life cycles, i.e. during their active period and hibernation period. Habitat connectivity to the wider landscape was also reviewed. The assessment took account of the requirements of different species relevant to the geographical location of the Site.

- 2.4.2 Following the habitat assessment, targeted surveys were conducted in line with current best practice and professional judgement on structures and trees within the Site to determine the likelihood of such features being used by roosting bats. For buildings this involved both internal and external inspections, including any roof voids and basements where present and access permitted.

2.5 Limitations

- 2.5.1 A summary of all limitations considered is provided in Appendix C.
- 2.5.2 Within the context of the Site and stage at which they occurred these limitations were not considered to negatively influence the outcome of the ecological and species-specific assessment of the Site.

2.6 Evaluation and Review

- 2.6.1 Upon completion of the desk study and field surveys the evaluation and review will consider each of the following:
- Habitats –
 - reviewed in relation to S41 Priority Habitats descriptions,
 - reviewed in relation to Local Biodiversity Action Plans,
 - condition assessed using criteria used to inform FEPs (i.e. that used in Biodiversity Impact Assessment Matrices),
 - potential to support Protected and Notable species,
 - Species – focusing on Protected and Notable species,
 - evidence on Site,
 - potential to occur on Site based on habitats, connectivity and known records,
 - structures and trees were categorised as having negligible, negligible to low, low, low to moderate, moderate, moderate to high, high or confirmed bat roost potential (see the Glossary for definitions),
 - Potential constraints to development (legal and policy implications relating to wildlife),
 - Potential for biodiversity enhancement.
- 2.6.2 The majority of impacts associated with development relate to species, including through habitat loss, fragmentation and deterioration, as well as direct harm and indirect effects. Therefore, until any necessary species-specific surveys, based on the outcome of this habitat focused ecological assessment, are completed it is not feasible to identify specific impacts in relation to developing the Site.

3. RESULTS

3.1 Desk Study

- 3.1.1 Full documentation of the data considered as part of this Ecological Assessment is provided in Appendix D. This section presents the key findings of significance to development at the Site. Species records are considered within the last 10 years (from date of desk study). The exception to this is species that are typically under recorded and/or have low dispersal rates, such as dormouse and white clawed crayfish. Other exceptions would be species likely to have strong associations with the habitats on Site, such as black redstarts and derelict buildings/structures on urban sites.

Statutory designated sites of nature conservation importance

- 3.1.2 The Site lies within 2 km of two overlapping statutory designated sites of nature conservation importance. Details of the designated sites returned by the desk study are provided below:
- Sherrardspark Wood, a 74.3 ha SSSI, is located approximately 990 m northwest of the Site with good connectivity. This site is designated for its biological value supporting extensive ancient semi-natural sessile oak/hornbeam dominated woodland as well as a diverse range of flora and invertebrates.
 - Sherrardspark Wood is also a designated LNR, which covers an area of 73.2 ha of the wood. The designation is for its biological value supporting important oak and hornbeam woodlands as well as a variety of birds, plants, mammals and fungi.
- 3.1.3 The Site lies within 5 km of a statutory site of nature conservation importance designated for bats. Details of the designated bat site returned by the desk study are provided below:
- Danesbury Park, a 24.5 ha LNR, is located approximately 3.7 km northwest of the Site with some connectivity to the Site. This site is designated for its biological value supporting bats within the site's large mature trees as well as a wide variety of flowering plants, invertebrates, birds, owls and fungi and insects.
- 3.1.4 The Site lies within the Impact Risk Zone (IRZ) of Sherrardspark Wood SSSI and Tewinbury SSSI. The following have been identified as potential risks and causes of risk to this designated site if such development takes place within the area under assessment:
- **Infrastructure:** Pipelines, pylons and overhead cables. Any transport proposal including road, rail and by water (excluding routine maintenance). Airports, helipads and other aviation proposals.
 - **Minerals, Oil & Gas:** Planning applications for quarries, including: new proposals, Review of Minerals Permissions (ROMP), extensions, variations to conditions etc. Oil & gas exploration/extraction.
 - **Residential:** Residential development of 100 units or more.
 - **Rural Residential:** Any residential development of 50 or more houses outside existing settlements/urban areas.

- **Air Pollution:** Any industrial/agricultural development that could cause AIR POLLUTION (including: industrial processes, livestock & poultry units with floorspace > 500m², slurry lagoons > 200m² & manure stores > 250t).
- **Combustion:** General combustion processes >20MW energy input. Including: energy from waste incineration, other incineration, landfill gas generation plant, pyrolysis/gasification, anaerobic digestion, sewage treatment works, other incineration/ combustion.
- **Waste:** Landfill. Including: inert landfill, non-hazardous landfill, hazardous landfill.
- **Composting:** Any composting proposal with more than 500 tonnes maximum annual operational throughput. Including: open windrow composting, in-vessel composting, anaerobic digestion, other waste management.
- **Discharges:** Any discharge of water or liquid waste of more than 5m³/day to ground (i.e. to seep away) or to surface water, such as a beck or stream (NB This does not include discharges to mains sewer which are unlikely to pose a risk at this location).
- **Water Supply:** Large infrastructure such as warehousing / industry where net additional gross internal floorspace is > 1,000m² or any development needing its own water supply.

Non-statutory designated sites of nature conservation importance

3.1.5 There are three non-statutory designated sites of nature conservation importance within 1 km of the Site as provided by Herts Environmental Records Centre, received 07/07/2020. Details of the designated sites returned by the desk study are provided below (excluding one LWS, Watch Mead Disused Railway, that appears from areal imagery to have been built upon in the early 2010s):

- Dismantled Railway (east of Sherrardspark Wood), a 2.49 ha LWS, is located approximately 520 m northwest of the Site with good connectivity. This site is designated for its biological value supporting old, possibly ancient woodland dominated by Hornbeam and with the occasional wild cherry and silver birch, as well as a semi-natural canopy and a variety of ground flora.
- Twentieth Mile Bridge Allotments, a 0.6 ha LWS, is located approximately 500 m south of the Site with good connectivity. This site is designated for its biological value supporting important protected species.
- Blackfan Valley, a 13.28 ha Local Wildlife Site situated 900m north-east of the Site with limited connectivity due to intervening built areas, predominately industrial/commercial. The LWS comprises of public open space, areas of old secondary broad-leaved woodland, scrub, tree planting area and also includes a reservoir/lake feature.

Priority habitats

3.1.6 Priority habitats returned by the desk study are listed in Appendix D. In summary, the following UK Priority Habitats occur (as depicted on *MAGIC*) within 1 km of the Site:

- Deciduous woodland – seven blocks of 30 parcels, the nearest of which is located approximately 450 m southeast of the Site.

Notable habitats

- 3.1.7 The following non-priority but notable habitats occur within 1 km of the Site:
- Ancient semi-natural woodland – one parcel located approximately 1 km northwest of the Site associated with the Sherrardspark Wood SSSI/LNR. This site was also returned in the data search from Herts Environmental Records Centre.
 - No main habitat but additional habitat exists – one block of two parcels, the nearest of which is located approximately 950 m south of the Site.
 - Open mosaic habitat – one parcel located approximately 700 m northeast of the Site.
- 3.1.8 A review of the Woodland Trust Ancient Tree Inventory highlighted four known ancient, veteran or notable trees within 1 km of the Site. Details are listed in Appendix D. In summary the following species were found between 450 m and 600 m from the Site:
- Wild service tree,
 - Indian beam,
 - Oak,
 - Hornbeam.

Protected Species

- 3.1.9 Danesbury Park LNR is designated for bats occupying large mature trees within parkland. This site is located approximately 3.7 km northwest of the Site with some connectivity through woodland and railway corridors.
- 3.1.10 A search on *MAGIC* returned no licence applications within 1 km (5 km for bats) of the Site relating to European Protected Species.
- 3.1.11 Table 3.1 summarises the protected species records, provided by Herts Environmental Records Centre (returned 07/07/2020), Natural England, *MAGIC* GCN Databases (Class Licences and country-wide baseline data) and previous BMD ecological assessment between 2013-2017, that occur within 1 km (extending to 5 km for bats) of the Site within the last 10 years. In addition, the following species have been recorded within the search area but are over 10 years old:
- Two hazel dormice records (EU and UK protection), the most recent and nearest recorded in 20/11/2008 located approximately 110 m southwest of the Site with good connectivity by the railway corridor linking to woodland.

Table 3.1 Protected species recorded within 1 km (5 km for bats) of the Site (as provided by Herts Environmental Records Centre 07/07/2020, NE/MAGIC GCN data and previous BMD ecological assessment between 2013-2017)

Species	Level of protection ¹	N- ^o , distribution & connectivity	Summary of records	
			Distance, direction & date	
			Nearest	Most recent
Birds				

Species	Level of protection ¹	N- ^o , distribution & connectivity	Summary of records	
			Distance, direction & date	
			Nearest	Most recent
Barn owl	UK - Schedule 1	One record – limited connectivity	890 m E (26/04/2015)	890 m E (26/04/2015)
Brambling	UK - Schedule 1	One record – connected	890 m E (28/11/2013)	890 m E (28/11/2013)
Common crossbill	UK - Schedule 1	One record - connected	890 m E (18/11/2015)	890 m E (18/11/2015)
Fieldfare	UK - Schedule 1	One record - connected	890 m E (04/12/2016)	890 m E (04/12/2016)
Firecrest	UK - Schedule 1	One record - connected	890 m E (26/09/2015)	890 m E (26/09/2015)
Green sandpiper	UK - Schedule 1	One record - connected	890 m E (28/12/2014)	890 m E (28/12/2014)
Hen harrier	UK - Schedule 1	One record - connected	890 m E (07/07/2015)	890 m E (07/07/2015)
Hobby	UK - Schedule 1	One record - connected	890 m E (25/09/2014)	890 m E (25/09/2014)
Kingfisher	UK - Schedule 1	One record - connected	890 m E (22/12/2013)	890 m E (22/12/2013)
Osprey	UK - Schedule 1	One record - connected	890 m E (26/03/2016)	890 m E (26/03/2016)
Peregrine	UK - Schedule 1	One record - connected	890 m E (25/07/2015)	890 m E (25/07/2015)
Red kite	UK - Schedule 1	Three records scattered – all connected	770 m NW (03/12/2016)	890 m E (26/12/2016)
Redwing	UK - Schedule 1	One record - connected	890 m E (27/12/2016)	890 m E (27/12/2016)
Bats				
Common pipistrelle	EU & UK	Nine records scattered – some connected by woodland/railway/residential garden/tree lined roads corridors	450 m W (05/01/2011)	3.9 km S (14/12/2017)
Soprano pipistrelle	EU & UK	Four records – some connected by woodland/railway/residential garden/tree lined roads corridors	830 m NE (08/04/2011)	4.8 km S (13/04/2016)
Brown long eared	EU & UK	Seven records – some connected by woodland/railway/residential garden/tree lined roads corridors	2.5 km NW (09/10/2014)	3.5 km NE (01/10/2017)
Notes 1. EU – European; UK – United Kingdom, refer to Glossary for details and definitions. 2. As provided the Herts Environmental Records Centre 3. As included on the NE Class Licence data return database (downloaded February 2020). 4. As included on the NE country-wide survey data (MAGIC).				

Notable species

- 3.1.12 There are no arable or grassland farmland bird assemblage, as depicted by *MAGIC*, within 1 km of the Site. However, grey partridge, tree sparrow and yellow wagtail are all present within 1 km of the Site, with tree sparrow overlapping the Site itself. Therefore, there is potential that such species may occur on or use the Site if suitable habitat is present.
- 3.1.13 Five hedgehog records were recorded on the Big Hedgehog Map (PTES, 2020) as of 15/07/2020. The nearest record with connectivity is approximately 550 m northwest of the Site.
- 3.1.14 Table 3.2 summarises the notable species records, provided by Herts Environmental Records Centre (received 07/07/2020) that occur within 1 km of the Site and within the last 10 years. This table excludes any species that are specifically protected (see Table 3.1).

Table 3.2 Notable species recorded within 1 km of the Site (as provided by Herts Environmental Records Centre; 07/07/2020)

Species	Status				N- ^o , distribution & connectivity	Summary of records	
	BAP ¹	S41	BoCC ²	Other ³		Distance, direction & date	
						Nearest	Most recent
Birds							
Bullfinch			✓		Seven records – connected	890 m E (08/02/2015)	890 m E (08/02/2015)
Common (Mealy) Redpoll			✓		One record – connected	890 m E (04/02/2012)	890 m E (04/02/2012)
Common Gull			✓		Two records – connected	890 m E (23/02/2013)	890 m E (23/02/2013)
Common Sandpiper			✓		One record – connected	890 m E (02/05/2016)	890 m E (02/05/2016)
Cuckoo	✓	✓	✓		Four records – connected	890 m E (10/08/2014)	890 m E (10/08/2014)
Curlew	✓	✓	✓		One record – connected	890 m E (05/07/2014)	890 m E (05/07/2014)
Gadwall			✓		One record – connected	890 m E (21/02/2016)	890 m E (21/02/2016)
Grey Heron				✓	Two records – connected	890 m E (09/04/2013)	890 m E (09/04/2013)
Grey Wagtail			✓		Fifteen records – connected	890 m E (02/09/2016)	890 m E (02/09/2016)
House Martin			✓		Six records – connected	890 m E (09/08/2015)	890 m E (09/08/2015)
House Sparrow	✓	✓	✓		One record – connected	890 m E (10/06/2015)	890 m E (10/06/2015)
Kestrel			✓		Five records – connected	890 m E (08/03/2016)	890 m E (08/03/2016)
Lapwing	✓	✓	✓		Two records – connected	890 m E (13/11/2013)	890 m E (13/11/2013)
Lesser Redpoll	✓	✓	✓		Twenty records – connected	890 m E (10/03/2016)	890 m E (10/03/2016)

Lesser Spotted Woodpecker			✓		Eight records – connected	890 m E (31/01/2016)	890 m E (31/01/2016)
Linnet			✓		Twenty records – connected	890 m E (04/01/2014)	890 m E (04/01/2014)
Marsh Tit			✓		Three records – connected	890 m E (23/03/2015)	890 m E (23/03/2015)
Mistle Thrush			✓		Six record – connected	890 m E (05/12/2013)	890 m E (05/12/2013)
Sand Martin			✓		One record – connected	890 m E (09/09/2012)	890 m E (09/09/2012)
Shoveler			✓	✓	Two records – connected	890 m E (21/02/2016)	890 m E (21/02/2016)
Skylark		✓	✓		Two records – connected	890 m E (16/04/2012)	890 m E (16/04/2012)
Snipe			✓	✓	Two records – connected	890 m E (01/09/2012)	890 m E (01/09/2012)
Song Thrush	✓		✓		Two records – connected	890 m E (11/02/2012)	890 m E (11/02/2012)
Spotted Flycatcher	✓	✓	✓		Three records connected	890 m E (02/07/2015)	890 m E (02/07/2015)
Stock Dove			✓		Eight records – connected	890 m E (01/02/2015)	890 m E (01/02/2015)
Swift			✓		Thirty records – connected	540 m W (19/06/2012)	890 m E (17/08/2016)
Tawny Owl			✓		Thirteen records – connected	890 m E (16/04/2016)	890 m E (16/04/2016)
Teal			✓	✓	One record – connected	890 m E (08/12/2016)	890 m E (08/12/2016)
Tree Sparrow	✓	✓	✓		One record – connected	890 m E (11/03/2015)	890 m E (11/03/2015)
Willow Warbler			✓		Eleven records – connected	890 m E (10/04/2014)	890 m E (10/04/2014)
Woodcock			✓		One record – connected	890 m E (25/01/2013)	890 m E (25/01/2013)
Yellowhammer	✓	✓	✓		Five records – connected	890 m E (04/01/2014)	890 m E (04/01/2014)
Invertebrates							
Dot Moth	✓	✓			One record – connected by residential gardens/railway corridor	920 m SW (26/07/2016)	920 m SW (26/07/2016)
Dusky Thorn	✓	✓			One record – connected by residential gardens/railway corridor	920 m SW (26/07/2016)	920 m SW (26/07/2016)
Ear Moth	✓	✓			One record – connected by residential gardens/railway corridor	920 m SW (26/07/2016)	920 m SW (26/07/2016)
Knot Grass	✓	✓			One record – connected by	920 m SW (26/07/2016)	920 m SW (26/07/2016)

					residential gardens/railway corridor		
Beautiful Knot-horn				✓	One record – connected by residential gardens/railway corridor	920 m SW (26/07/2016)	920 m SW (26/07/2016)
Little Emerald				✓	One record – connected by residential gardens/railway corridor	920 m SW (26/07/2016)	920 m SW (26/07/2016)
White Satin Moth				✓	One record – connected by residential gardens/railway corridor	920 m SW (26/07/2016)	920 m SW (26/07/2016)
Mammals (Excl. Bats)							
West European Hedgehog	✓	✓			Seven records scattered – all connected by residential gardens and railway corridors	330 m SE (2014)	920 m SE (20/05/2015)
Notes 1. Biodiversity Action Plan: UK – UK; L – Local 2. Birds of Conservation Concern: R – Red listed; A – Amber listed 3. Other: (Herts locally breeding population or threatened/rare species) Refer to Glossary for definitions							

Non-native invasive species

3.1.15 Previous ecological assessments carried out on the Site by BMD between 2013 to 2017 found the following non-native invasive species within 1 km of the Site (qualifying species are principally those with legislative classification, listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended) but excludes widely naturalised species such as grey squirrel; see Glossary for details):

- Five stands of Japanese knotweed recorded between October 2013 and May 2014 located on the Site itself towards the western edge of the Site.
- Cotoneaster sp./wall cotoneaster.

3.2 Extended Phase 1 Habitat Survey: Habitats

Local context

3.2.1 The following habitats were recorded immediately adjacent to the Site:

- North: foot path and Bridge Road (B195) with species poor intact hedgerow/scattered scrub and trees surrounding the adjacent industrial units and carparks.
- East: foot path and Broadwater Road (A1000) with species poor intact hedgerow and scattered trees surrounding adjacent office buildings and carparks.

- South: Hydeway road and footpath with site/palisade fencing and recently cleared land (for south site development phase). Patches of ephemeral/short perennials are recolonising the disturbed land with species including scattered buddleia, mugwort, rosebay willowherb, thistle etc.
- West: access road and strip of grassland/scrub verge with scattered trees. A railway line, train station and shopping centre lie beyond.

Site

- 3.2.2 The Site is approximately 4.23 ha and comprises predominately of disturbed land with ephemeral/short perennial vegetation, hardstanding and derelict factory buildings/silos. The remainder of the Site comprises of; species poor intact hedgerows, amenity grassland, species poor semi-improved grassland, tall ruderal vegetation, dense continuous scrub, semi-improved grassland, scattered trees and scrub.
- 3.2.3 A map depicting the distribution of the habitats, photographs and species recorded are provided in the Appendix.

Site boundaries and internal liner features

- 3.2.4 The following habitats were recorded immediately adjacent to the Site: i.e. approx. 50 m from site boundary and visible from boundary/inferred from aerials etc.;
- The east boundary comprises of a fence and intact species poor hedge (H1 - dominated by viburnum, privet, cotoneaster) with amenity grassland (dominated by creeping thistle, bramble, creeping cinquefoil, selfheal, common bent, yarrow). The amenity grassland is currently unmanaged and taking on characteristics of a species poor semi-improved grassland.
 - Near the west boundary there is a hardstanding track with an intact species poor hedgerow (H2 - dominated by buddleia with willow, privet, elder, dog rose) to the east and a wooden/palisade fence line with buddleia and dog rose to the west, scattered plants can be found below (such as narrow leaved ragwort, evening primrose, mugwort, bramble).
 - The northern boundary comprises of a palisade fence line with buddleia and dog rose dense continuous scrub.
 - The southern boundary comprises of a strip of poor semi-improved grassland with scattered sycamore trees and a patch of non-native invasive cotoneaster (grassland dominated by common bent, yarrow, mugwort, creeping thistle, bramble, meadow grass, perennial rye grass).
 - Near the northern boundary there is tall ruderal vegetation (dominated by buddleia with species such as mugwort, great willowherb, creeping cinquefoil, narrow leaved ragwort) with stands of false oat grass and thistle.
 - The western side of the Site comprises of an area of former amenity grassland which is now degraded/poor semi-improved grassland with scattered buddleia and semi-mature poplar at southern end. There is a high proportion of tall ruderal vegetation and a lime tree towards northern end (northern/middle section dominated by nettle, creeping thistle, bramble, hemlock, southern section dominated by bent grass, false oat grass, ribwort, yarrow, perennial rye grass).
 - The southwestern corner of the Site comprises of a row of semi-mature/mature trees including copper beech, horse chestnut and sycamore with some scattered plants below.

- There is a strip of hardstanding running inside the boundary of the entire Site associated with adjacent access road along the western boundary (with the railway beyond).

Habitats

3.2.5 The following habitats were recorded on Site.

Buildings

3.2.6 A number of previously recorded buildings have since been demolished with the following features retained on Site –

- Building B1a is a retained part of the larger former Shredded Wheat building complex (Photograph 1). As per previous assessments the remaining building comprises of a multi-storey structure of brick and concrete construction with a flat roof. The external walls are mostly rendered with some areas of previously internal walls (e.g. northern boundary) now forming the external wall. Internally, B1a is sub-divided in the lower levels/basement areas in various sections with upper levels open plan with concrete/steel pillars (Photograph 2). These areas are open and light. The basement areas were darker with some sections flooded.
- Building B1c comprises of the retained grain silos and the boiler room/offices to the south (Photograph 3 and 4). The retained building sections are as previously assessed and in similar condition as described in 2017. The southern building is an in-use office/reception area and the western building is a former boiler room.
- B2 is part of the former factory block, now a small retained substation with flat roof (Photograph 5).

Bare ground/ephemerals and short perennials

3.2.7 A large area of the Site is dominated by recently disturbed ground of recently demolished buildings with areas of levelled aggregate remaining. Large areas are devoid of vegetation with smaller patches of colonising vegetation present dominated by mugwort, Canadian goldenrod, ragwort, yarrow, great willowherb, buddleia etc. (Photograph 6).

3.2.8 Other bare ground areas include hardstanding associated with access roads, the carpark area (western boundary), carpark/compound areas (south-western corner) and internal roads.

Scattered Trees, scrub and introduced shrubs

3.2.9 A number of scattered trees remain present, predominately along the Site boundaries including specimens of sycamore, cherry, willow, silver birch, Swedish whitebeam, horse chestnut, copper beech, lime etc.

3.2.10 Areas of scattered scrub were present across the Site, particularly along the boundaries and in the western area of the Site. Scrub included buddleia, bramble, willow, elder, privet, dog rose, young sycamore etc.

3.2.11 Notable areas of dense scrub include the patches along the former access track to the west of H2, areas of buddleia/dog rose along the central part of the northern boundary and bramble/buddleia patches on the area of poor semi-improved grassland in the northwest corner.

3.2.12 Introduced shrubs were present within the Site, predominately associated with the northern and eastern boundaries, comprising of former amenity planting including species such as firethorn, cotoneaster, smoke tree, Mexican orange, lilac and a few introduced plant species such as lambs-ear.

Tall Ruderal

3.2.13 Areas of tall ruderal had established on the edges of the recently cleared section along the northern boundary, on areas of former amenity verge that had overgrown (grass verges to the west of B1a) and along the eastern boundary of the grassland area in the northwest of the Site. Species include thistle, mugwort, bristly oxtongue, great willowherb, narrow leaved ragwort, mullein, rosebay willowherb, hemlock, perforate St John's wort, prickly lettuce, Canadian goldenrod, prickly sow thistle, teasel, evening primrose, dock and patches of low-lying buddleia and bramble.

Grassland

3.2.14 Small areas of amenity grassland remain on Site supporting common and widespread species such as creeping bent, perennial rye grass, false oat grass, selfheal, creeping cinquefoil, creeping buttercup. Some areas of former verge have reverted to a poor semi-improved grassland community due to reduced management and are dominated by rough grass areas and patches of ruderal.

3.2.15 The north-western corner of the Site continues to support a semi-improved grassland/scrub/tall ruderal mosaic that supports areas of flowering plants such as birds foot trefoil, perforate St John's-wort, selfheal, meadow buttercup, meadow vetchling, common century, common mallow, yarrow etc. The area supports patches of bramble and buddleia scrub and also denser areas of tall ruderal along the eastern edge (Photograph 7). The vegetation is sparse in areas indicating previous disturbances, associated with the construction of the adjacent access road to the west which now separates the area from the adjacent railway corridor. There is also litter/debris present in the northern section against the road.

Extended Phase 1 Habitat Survey: Protected and Notable Species

3.2.16 There was direct evidence of the following protected and notable species on or immediately adjacent to the Site:

- Peregrine falcon present in the area with multiple flyovers recorded during the Site visit on 14th July 2020. It is understood that the pair have successfully breed this year on the silo building, using an artificial nest site installed and monitored by licensed persons in agreement with the landowner.

3.2.17 Other species recorded during the survey are listed in Appendix D. The potential for the habitats on Site to support other protected and notable species is discussed in Section 4: Evaluation.

3.3 Bat Assessment: Landscape Habitat Review

- 3.3.1 A review of readily available historic maps and aerial images indicates the landscape has been dominated by a mix of industrial and residential land since at least the 1950s, with some agricultural land dominating the wider landscape surrounding Welwyn Garden City.
- 3.3.2 The landscape surrounding the Site is predominantly industrial with some retail. The railway line corridor to the west of the Site provides linkages to residential areas, agricultural land and Sherrardspark Wood.
- 3.3.3 Sherrardspark Wood, residential gardens and hedge-bound agricultural land provide foraging habitats for bats, while the many tree lined roads and adjacent railway line of Welwyn Garden City link the Site to these foraging grounds by providing commuting/foraging corridors.
- 3.3.4 Table 3.3 provides an overview of habitats within 5 km of the Site in terms of its value to bats.

Table 3.3 Habitat review for its potential value for bats within 5 km of the site

Zone	Review
0 – 1 km	The landscape from 0-1 km is a mix of industrial/retail and residential. Summary: good foraging/commuter opportunities to the northwest, some foraging opportunities to the west, low opportunities north, east and south. Roosting opportunities likely to be associated with the residential properties to the west/southwest/northwest and trees to the north/northwest.
1 – 2 km	The features of the 0-1 km zone continue out into this zone, i.e. mix of industrial/retail and residential built environment. Sherrardspark Wood SSSI/LNR to the northwest contains a mix of priority deciduous and ancient semi-natural woodland, with many ancient, notable and veteran trees. This wood is linked to the Site by a woodland strip leading onto the railway corridor adjacent to the west of the Site. There is likely to be bat roost potential within Sherrardspark Wood and these bats are likely to use the woodland strip, tree lined roads, residential gardens and railway line as foraging grounds and commuting corridors. Further potential for bat roosts, foraging grounds and commuter corridors can be found in the residential areas bordering the agricultural land surrounding Welwyn Garden City to the north, east and south. These areas are again linked to the site via woodland strips, tree lined roads and residential gardens. Summary: high foraging/commuter opportunities to the northwest associated with Sherrardspark Wood with connectivity by way of the railway corridor, some foraging/commuting opportunities to the north, south, east and west. Roosting opportunities likely to be associated with Sherrardspark Wood and the residential properties to the west, south and east and trees to the north/northwest.
2 – 5 km	The features of the 0-1 km and 1-2 km zone continue out into the 2-5 km zone slightly but with agricultural land becoming the dominant land use type beyond. This zone also includes part of the town of Hatfield to the south, Welwyn to the northwest and Digsweil to the north, with other smaller scattered villages. The railway corridor running through the center of Welwyn Garden City will continue to act as a commuting corridor. Tewinbury SSSI, The Commons LNR, Stanborough Reedmarsh LNR Singlers Marsh LNR and Danesbury Park LNR lie within this zone. The habitats associated with these Sites, e.g. alluvial/wet meadows, wet woodland, fine reed marsh, fen, woodland and grassland, will provide high foraging habitat for bats. Summary: The value to bats increases in this zone with the railway and woodland strips acting as two major commuter corridors. This zone offers high foraging and commuting opportunities with roosting opportunities most likely to be associated with the areas of woodland such as Sherrardspark Wood and residential properties.

3.4 Habitat Assessment

- 3.4.1 The habitats on Site and those immediately adjacent to the Site were evaluated for their potential to support foraging bats:

3.4.2 Generally, the Site itself offered only limited bat foraging associated with retained tree lines, small sections of edge habitat and patches of scrub/shrubs.

3.4.3 The railway corridor to the west of the Site offers foraging and commuting opportunities north and south, with minor corridors present elsewhere in terms of pocket parks, gardens and lines of street trees etc.

3.5 Structure and Tree Assessment




3.5.1 This Section provides an overview of each of the structures and trees assessed for their potential to support bats.


3.5.2 All structures were considered to be of negligible to negligible/low potential for supporting bats. No evidence of bats was found during the surveys of the buildings. The findings were similar to the conclusions of the 2014/2017 assessments.

3.5.3 No tree features supporting bat roosting potential were recorded during the walkover survey.

3.5.4 Table 3.4 provides a summary of structure assessments in relation to the value to bats.

Table 3.4 Summary of structure assessments on 14/07/2020 in relation to the value to bats

Building Ref	Building/ structure style	Notes	Category	Photograph
B1a	Former factory	<p>Netted windows, generally open and light, generally low bat potential, basement area is dark to the west and light to the east, no signs of use by bats with only limited potential and limited access. Structures have been subject to recent high levels of disturbance associated with demolition works.</p> <p>No evidence of bats found.</p>	Negligible/low	
B1c	Boiler room to south-west of silo's	<p>Open up to high ceiling, generally light with limited suitability for bat roosting.</p> <p>No signs of bats identified.</p>	Negligible/low	
B1c	Retained Silos	<p>Netted windows, lower level dark but well-sealed and clean, upper levels to the west are light with windows.</p> <p>No signs of bats identified.</p>	Negligible/low	

Building Ref	Building/ structure style	Notes	Category	Photograph
B2	Sub station	<p>Flat roof feature, retained as part of the demolition works. No obvious access points and remains well sealed. No internal inspection completed as not accessible. Subject to recent disturbances.</p> <p>No signs of bats identified.</p>	Negligible	

4. EVALUATION

4.1 Introduction

4.1.1 This Section reviews the results of the desk study and field surveys in relation to the proposed development proposals; it:

- Determines the ecological importance of habitats at an appropriate geographic level,
- Determines the likelihood of protected and notable species occurring on Site, with particular attention being paid to bats,
- Identifies any legal and policy implications for developing the Site in relation to nature conservation sites, habitats and species potentially associated with the Site,
- Identifies high-level biodiversity gain opportunities.

4.2 Habitats

4.2.1 None of the habitats on Site meet the appropriate criteria to be considered as UK Priority Habitats or Local BAP Habitats.

4.2.2 None of the hedgerows are likely to meet the criteria for classification as an *Important Hedgerow* under Hedgerow Regulations 1997.

4.2.3 Table 4.1 provides a summary of the nature conservation importance of habitats within Site.

Table 4.1 Ecological importance of habitats occurring on Site and geographical context

Habitat	Meets UK Priority/Local BAP habitat criteria	Condition ²	Geographical context ³
Semi-mature trees/shrubs	No	Poor-moderate	Site
Buildings	No	Poor	Site
Grassland; amenity and poor semi-improved	No	Poor	Site
Tall ruderal	No	Poor	Site
Ephemeral and short perennial	No	Poor	Site
Scattered/ dense continuous scrub	No	Poor	Site
Notes 1. As determined using FEPs guidance. Where it is considered that the FEP condition outcome is inappropriate justification is given in the text 2. Geographic level at which the habitat is considered important			

4.3 Species

4.3.1 This section considers the actual occurrence or potential occurrence of protected and notable species (including non-native invasive species) occurring on Site. It takes account of known data records and habitats on Site and connectivity, appropriate to given species, across the landscape. Species not specifically listed in this Section are unlikely to occur on Site on account of at least one of the following factors:

- No habitat on Site to support the species,
- No connectivity to suitable habitat beyond the Site boundary,
- Site is outside of the species typical geographic range.

4.3.2 Bats are considered in more detail in Section 4.4.

4.3.3 Based on the habitats recorded on Site and/or direct evidence, the following protected and notable (including non-native invasive species) species occur, or have potential to occur, within the Site:

- Nesting birds: The Site provides limited opportunities for nesting birds within built structures and in retained tree/shrub and scrub areas.
- Peregrine falcon: Recorded as present and known to have successful breed on site during the 2020 breeding season.
- Hedgehogs: The hedgerows/site edges may be used by foraging and commuting hedgehogs.
- Reptiles: Some limited opportunities for reptile due to previous presence on Site and suitable habitat still present in small areas/on the peripheries.
- Invasive species: Cotoneaster, a non-native invasive species, was noted on Site.

4.3.4 Based on the limited semi-natural habitats recorded on Site, the Site is considered unlikely to support significant populations of other protected or notable species. The habitats were low in species diversity, are generally common and widespread and have experienced recent disturbances with regard to site demolition works as well as ongoing low-level disturbances associated with management/maintenance of the Site.

4.3.5 Table 4.2 provides a summary of protected and notable species (including non-native invasive species) considered in this assessment. Where there is potential for a species to occur but no current evidence the likely associated habitats and location within the Site are given. Associated habitats and location within the Site are also indicated where there is evidence of a species occurring on Site.

Table 4.2 Summary of protected and notable species (including non-native invasive species) considered in this assessment

Species	Status ¹	Confirmed on Site ²	Potential to occur	Associated habitats/Location on Site
Bats	EU, UK, N	No	Only limited potential associated with buildings. Some foraging areas associated with edge habitats.	Buildings Boundary trees/habitats
Breeding birds (general, including notable species)	UK, N	Yes - field	Yes	Buildings and retained vegetation areas
Peregrine falcon	UK, N	Yes - field	Yes	Retained Silo structure
Reptiles – slow worm	UK, N	No	Previously translocated from	North-western boundary near to

Species	Status ¹	Confirmed on Site ²	Potential to occur	Associated habitats/Location on Site
			site, low level risk of residual individuals in locality	railway, although previously cleared and now separated from railway by access road.
Cotoneaster	I	Yes -field	Yes	Variants of cotoneaster in retained landscaped areas
Japanese knotweed	I	No	Yes, previously present but none recorded during walkover	Verges and former shrub beds.
Notes 1. EU – European protected. UK – UK protected. N – Notable species. I – non-native invasive species 2. Field – field evidence; Desk – desk study evidence.				

4.4 Bats

- 4.4.1 This section provides a more detailed consideration of the Site and surrounding landscape in relation to supporting bats, taking account of both the desk study and field data.
- 4.4.2 There is one statutory designated conversation site designated for its bat population within 5 km of the Site. Danesbury Park LNR is home to many bats occupying the large mature trees within an area of parkland. This site is located approximately 3.7 km northwest of the Site with some connectivity to the Site through woodland and railway corridors. It is unlikely that the Site would form part of the core habitats utilised by bats associated with the statutory sites as it on the outer edge of the Core Substance Zone (CSZ) of all bat species as indicted in Collins (2016). There is also higher quality and more extensive habitat nearer the sites.
- 4.4.3 Thirteen pipistrelle (common/soprano) records between 450 m and 5 km of the Site and seven brown long eared bat records between 2.5 km and 5 km of the Site were returned from the local records (HERC).
- 4.4.4 Common/soprano pipistrelles and brown long-eared bat may utilise the Site as commuting or foraging grounds due to pipistrelles being generalists and brown long eared bats preferring trees, woodlands and hedgerow.
- 4.4.5 Based on the habitats present the Site is considered to be of moderate value for foraging and commuting bats. The majority of the Site is considered to be of low value being dominated by non-suitable buildings and hardstanding. Hedgerows, scattered trees and grassland offer some foraging habitat.
- 4.4.6 The Site offers limited tree roosting opportunities with no potential tree roosting features identified during the walkover. The Site offers negligible to low bat or bat roosting opportunities within buildings.
- 4.4.7 Overall, the Site is considered to offer low potential for roosting with nearby residential properties likely to offer more options.

- 4.4.8 Using Wrey *et al* (2010) as a guide it is considered that the Site is likely to be of parish value for commuting and foraging bats and parish value for roosting bats.

4.5 Legal and Policy Implications

Nature conservation sites

- 4.5.1 The statutory designated sites of nature conservation importance identified during the desk study are sufficiently removed from the Site to not be affected by development of the Site. Therefore, no legal or policy implications are anticipated.
- 4.5.2 The Site lies within the Impact Risk Zone (IRZ) of Sherrardspark Wood SSSI and Tewinbury SSSI. The proposed development is included on the list of developments likely to be a risk to the corresponding SSSI (Residential development of 100 units or more; Development needing its own water supply). Therefore, it is anticipated that Natural England will need to be consulted on any development at the Site.
- 4.5.3 The dismantled Railway LWS and Twentieth Mile Bridge Allotments LWS are connected to the Site via a railway corridor and hedgerows with trees. However, given the nature of the proposals, and given that there are no known hydrological links connecting these non-statutory designations with the proposed development site, it is considered that these sites will not be affected by development of the Site. Therefore, no legal or policy implications are anticipated.

Habitats

- 4.5.4 The Site is dominated by built structure and hardstanding with limited ecological value. Peripheral habitats and scattered trees/shrubs within the Site provide some restricted habitat features with the north-western corner supporting a mosaic of grass, scrub and tall ruderal.
- 4.5.5 The habitats on Site were small, isolated, species poor and subject to levels of disturbance. None of the habitats recorded were considered to meet the appropriate criteria to be considered as UK Priority Habitats or Local BAP habitats

Species

- 4.5.6 The potential presence of protected and/or notable species on Site means that are a material consideration in the planning system through the NPPF and the Local Planning Policy. The following species have policy implications if impacted by the proposed development and include:
- Bats – the Site offers only limited potential for roosting bats.
 - Nesting birds – the Site has/is being used by nesting species and there is potential for it to be used by other species for nesting, including schedule 1/notable species, e.g. peregrine falcon and house sparrow.
 - Reptiles – low risk, associated with landscaped areas, dense sections on peripheries.
 - Hedgehog – associated with landscaped areas, dense sections on peripheries.

- Non-native invasive species – buddleia and cotoneaster have been confirmed to be present on Site.
Risk of Japanese knotweed due to historic presence on Site.

4.5.7 Any development of the Site could have impacts on any of the listed species if confirmed to be present. Further survey work is necessary to fully determine the implications of these species in relation to developing the Site.

Summary

4.5.8 Based on the current known ecological baseline of the Site, Table 4.3 summarises the legal and policy implications in relation to wildlife for developing the Site.

Table 4.3 Legal and policy implications of developing the Site

Habitat	Protected &/or notable species associated with the habitat	Legal implication	Policy implication
Semi-natural habitats	Provides nesting bird habitat (trees, shrubs)	All birds are protected during nesting period. Appropriate avoidance method statements will be necessary to develop the Site e.g. sensitive timings or supervision as required.	NPPF & local policy pertaining to protected, notable and invasive species
	Hedgehog	Protected against harm. Reasonable Avoidance Methods should be implemented.	
	Reptile	Protected against harm. Reasonable Avoidance Methods should be implemented/controlled vegetation clearance at appropriate time of year.	
	Buddleia, Japanese knotweed and cotoneaster non-native species	Cause to spread these species is in contradiction to legalisation. Appropriate control/eradication method statements will be necessary to develop the Site.	
Buildings	Bats	Generally low risk due to Site conditions and building types, precautionary approaches implemented in line with other species e.g. nesting bird checks.	
	Provides nesting bird habitat Peregrine falcon nest site	See above Schedule 1 bird will require additional measures to ensure no disturbances during construction stage works.	

Habitat	Protected &/or notable species associated with the habitat	Legal implication	Policy implication
Hard standing	Buddleia non-native species	See above	

4.6 Opportunities for Achieving Biodiversity Gain

Habitat enhancement and creation

4.6.1 There is minimal semi-natural habitat existing on Site and generally only limited areas in proximity to the Site. Therefore, the creation of any semi-natural habitat with a focus on promoting wildlife is likely to result in biodiversity net gain. Habitats to consider include:

- Green walls
- Green/brown roofs to mimic brownfield field sites (will benefit invertebrates and birds).
- Ephemeral vegetation on loose substrate to mimic open mosaic habitat
- Wetland areas associated with SUDS.
- Trees and shrubs – native/wildlife friendly cultivars and species, particular along the peripheries of the Site adjacent to existing trees/shrubs (e.g. western boundary and north-eastern boundary).

4.6.2 Given the urban nature of the Site and lack of connectivity to natural habitats it is not considered critical to restrict habitat creation and soft landscaping to native species. However, any species or cultivar listed on the Wildlife and Countryside Act Schedule 9 must be avoided.

Species enhancement

4.6.3 Based on the habitats on Site and desk study data the following species-specific enhancement would be appropriate:

- Bats:
 - Bat boxes/integrated roosting features for common pipistrelles, soprano pipistrelle, brown long eared and noctule bats. Specifically, it is recommended that new optimal roosting opportunities for bats be provided in the form of woodcrete bat boxes upon retained mature trees, as well as the incorporation of bat bricks, and/or bat roosting units, and/or bat tubes, and/or bat tiles into a number of the new buildings proposed at the Site.
 - It is recommended that new buildings adjacent to railway corridor or situated adjacent to the northern embankment be targeted for the incorporation of new roosting features for bats. In particular, these features should largely be located upon the southerly /south-easterly /south-westerly elevations of these buildings.
 - Bat friendly planting in any soft landscaping, e.g. night scented species to be provided along the northwestern boundary of the site to help ameliorate potential lighting impacts upon the adjacent bat foraging /commuting corridor (i.e. the adjacent railway corridor). It is recommended that this planting largely comprise native tree and shrub species (as previously detailed). Such planting would not only provide a buffer to the railway corridor, but would also provide an additional resource for bats along a likely main bat foraging /commuting corridor.

- Birds:
 - It is recommended that new optimal nesting opportunities be provided at the site as part of the proposals. In particular, given that a number of house sparrow records have been recorded in the surrounding area, and given the urban context of the site, it is recommended that nesting opportunities for this priority species be provided, with a number of house sparrow terraces installed upon the new buildings. Sparrow nest boxes should ideally be positioned close to the eaves of the new buildings, adjacent to one-another along the northern /north-eastern / or north-western elevations to keep them out of direct sunlight and prevent birds abandoning their nests in warmer weather.
 - Consideration should also be given to the provision of nesting boxes at the site for other declining bird species. In particular, it is recommended that a number of starling boxes be installed, with records of its presence in the local area confirmed from the data search exercise.
 - In addition, it is recommended that a number of standard bird boxes, which are suitable for a wide variety of bird species, as well as a number of open-fronted nest boxes which are often utilised by species such as wren, be installed at the site. Ideally these boxes should be installed high up upon retained semimature /mature trees and scrub around the boundaries of the site.
 - In addition, it is recommended that new areas of dense shrub planting be incorporated into the landscape proposals to provide natural nest sites for species such as song thrush. It is recommended that such features, as well as other areas of new tree and shrub planting, incorporate a number of native fruit and seed-bearing species to provide an additional foraging resource for birds at the site.
 - An artificial nest site for peregrine falcon is present on Site and this feature should be maintained for the long-term to ensure successful peregrine falcon breeding at the Site post-development.
- Hedgehogs:
 - Ensure the developed area is permeable for hedgerows through the provision of hedgehog highways.
 - Install a number of hedgehog nesting domes as part of the proposals. It is recommended that these domes ideally be situated within areas of dense new boundary planting to provide optimal shelter opportunities for this species at the site, within associated dispersal corridors.
- Invertebrates:
 - It is recommended that the new landscape scheme predominantly comprise of native species and/or species of wildlife value (as detailed below and within Natural England's 2007 publication entitled 'Plants for Wildlife-friendly Gardens'). In particular it is recommended that alternative foraging habitat be provided for bumblebees and butterflies, given the presence of rank grassland and buddleia scrub currently present at the site.
 - It is recommended that a stag beetle loggery be created within one of the new areas of boundary planting.
 - It is also recommended that a number of potential shelter sites be created for bumblebees at the site including areas of deadwood /log piles partially covered with a topsoil cap. In this regard it is recommended that any arisings from tree works should be used to create

brashwood and log piles within vegetated areas around the boundaries of the site, whilst standing or fallen deadwood in these areas should be retained in situ, where safe to do so.

- High pollen value species included in the soft landscaping
- Diverse planting mixes
- Micro-topographic features within landscaped areas.
- Reptiles
 - Given the known presence of reptiles within the local vicinity of the site, including the adjacent railway corridor, it is recommended that a purpose-built reptile hibernaculum be provided within the site as part of the proposals. It is important that this over-wintering feature be situated in an area of the site that is going to remain dry throughout the winter period, but also in habitat connected to the adjacent railway corridor. As such, it is recommended that this feature be constructed within the new area of landscaping proposed along the north-western boundary of the site.

5. RECOMMENDATIONS

5.1 Surveys

- 5.1.1 Based on the evaluation documented in Section 4, no further surveys are deemed appropriate and/or necessary at this stage.

5.2 Retention and Enhancement

- 5.2.1 It is recommended that the opportunities for biodiversity enhancement detailed in Section 4.6 are reviewed and considered when developing plans for development of the Site.
- 5.2.2 The habitats of greatest ecological importance are as follows and it is highly recommended that these are retained where possible:
- Semi-mature trees
- 5.2.3 Retaining and creating dark corridors is strongly encouraged along with wildlife sensitive lighting throughout the Site.

5.3 Mitigation

- 5.3.1 This Section is based on the current baseline data. It outlines recommended ecological control and protection measures to be undertaken to ensure:
- No harm comes to faunal species (unprotected species as well as protected and notable species);
 - There is minimal habitat loss and disturbance;
 - No harm comes to the adjacent habitats;
 - Pollution risk is minimised;
 - Ecological best practice is followed;
 - Conformity with current planning requirements pertaining to wildlife; and,
 - No breaches of current wildlife legislation.
- 5.3.2 The following mechanisms will ensure implementation of the protection measures:
- **Licence applications** – any necessary licences will ensure compliance with European legislation (European Protected Species) and domestic legislation (badgers). The licence applications will provide detailed and specific protection measures and time frames for the given species. Based on current baseline data it is considered that badger, bat and great crested newt mitigation licences are required to facilitate construction in specific areas of the Site.
 - **Ecological Management Team** – an Ecological Management Team will be appointed and will include:
 - Ecological Manager responsible for over-seeing all ecological works. Their role will include but not be restricted to: liaison with Natural England and other interested parties with an ecological interest, writing/approving Ecological permits, Certificates and Rectification notices, preparing

licence applications, writing and approving tool box talks and providing ecological guidance to the Site team.

- Ecological Clerk of Works (ECoW) whose role will include but not be restricted to: supervision of works in medium to high risk zones, delivering tool box talks, ensuring licence requirements and ecological protocol are adhered to and raising quality alerts and stop works (if appropriate) for any non-compliance with ecological protocol/permits.
- Biodiversity Champion (or similar) – a Biodiversity Champion will be appointed within the construction team (this can be the Site or Project Manager or representative from the Main Contractor).
- This person will be responsible for ensuring that any Ecological Implementation and Mitigation Plan for developing the Site and the information given during the Tool Box talks are adhered to.
- This person will contact the Ecological Manager if they are in any doubt about ecological/wildlife aspects of the works.
- **Ecological Audits** – Works will be controlled and audited through a series of documents:
 - Ecological Permits to Work – issued by the Ecological Manager prior to works commencing. These will set out details of protection measures and responsibilities for specific site operations. They will be time and area limited.
 - Ecological Certificates – issued following completion of location or works covered by an Ecological Permit to Work to an acceptable standard. Issued by the Ecological Manager.
 - Rectification Notices – issued by the Ecological Manager/ECoW where deemed appropriate.
 - Daily Record Sheets – Completed by the ECoW to record actions and observations each day. Used to inform Ecological Permits, Certificates and Rectification Notices.
 - Weekly Report - Completed by the ECoW based on the Daily Record Sheets.
 - Monthly Report – Completed by the Ecological Manager highlighting any issues encountered during the month and identifying any necessary amendments to management/protection measures etc to ensure continued safe guarding of ecological features. To include revised Ecological Risk Zone plan as appropriate.
- **Tool box talk** – To be given to all Site staff, including those joining later in the project. Site staff to be made aware of the safeguard measures put in place and why they are necessary.
- **Ecological Risk Zones** – A plan will be produced indicating different areas of ecological risk associated with the works. This will be a ‘live’ plan and will be continually updated throughout the construction period to reflect changing situations as mitigation is implemented, e.g. habitat reduction and any species re-locations. Where necessary these zones will be clearly marked on the ground using fencing appropriate to the situation and level of risk. Fencing may range from ‘spike-and-rope’ to Heras fencing. A summary table will accompany the plan detailing specific control measures for each zone.

5.3.3 The measures detailed focus on legally protected and notable species but will also ensure harm and disturbance is minimised to other fauna that may utilise the Site.

Generic safeguarding measures

5.3.4 Ecological tool box talk:

- To be given to all contractors on Site during their Site induction making them aware of potential for protected/notable habitats and species, the need for protective fencing and pollution awareness. This should cover key species relevant to the Site and any retained habitats within the works areas and adjacent areas.
- Following the tool box talk, Site contractors should have sufficient knowledge and confidence to provide a watching brief in low risk areas and during low risk operations and know when to contact the Ecological Management Team for guidance and assistance.

5.3.5 Permits to Work:

- Prior to any work taking place in ecological risk zones an appropriate Permit to Work will be issued by the Ecological Manager and countered signed by the contractor agreeing to any necessary mitigation requirements.

5.3.6 Ecological Risk Zones:

- A plan will be produced showing areas of high, medium and low ecological risk. Each risk zone will have different levels of ecological mitigation and control:
 - High Risk (red zones) – areas of greatest ecological sensitivity and/or most vulnerable to damage. These zones will be subject to the most stringent level of control and supervision (typically full-time). Examples of such zones include, but are not restricted to: nesting bird habitats (during nesting season), situations requiring a protected species licence, notable and protected species directly affected by works, and species that may be sensitive to disturbance (e.g. Schedule 1 nesting bird species). Works to stop immediately if any ecological concerns arise.
 - Medium Risk (amber zones) – areas of moderate to high ecological value and /or vulnerability which may be directly or indirectly affected by the works. Works in these zones will be regularly monitored by the ECoW. Examples of such zones include, but not restricted to: nesting bird habitats (outside of nesting season); protected/notable species between 100 – 500 m of the works. Works to stop immediately if any ecological concerns arise.
 - Low Risk (green zones) – areas of low ecological value and/or vulnerability. In these zones works will adhere to best practice at all times within only periodic monitoring by the ECoW (regularity to be determined by the ECoW in conjunction with the Biodiversity Champion). Works to stop immediately if any ecological concerns arise.

5.3.7 Pollution:

- The former Pollution Prevention Guidelines (PPG) have been withdrawn while they are being reviewed and updated. Until such time as new guidance becomes available, standard industry best practice in relation to construction sites and dust production/water pollution must be adhered. Further guidance is to be documented in a Construction Environmental Management Plan (CEMP). Measures to include:

- Throughout the construction period appropriate spill kits to be readily available at all times.
- Fuel to be appropriately and safely stored to current construction site standard.
- Dust damping measures.

5.3.8 Works between sunset and sunrise:

- To be avoided.
- If works cannot be avoided then there is to be no significant increase in external light and noise over and above what is anticipated in the area post construction. It is noted that the baseline of light and disturbance levels are likely to already be high in certain areas but any increase in such activity in other more sensitive areas would require careful planning with the Biodiversity Champion and Ecological Management Team.

Habitats – Retained and adjacent to site

5.3.9 Trees and hedges:

- Semi-mature trees and hedges to be retained and safeguarded where possible.
- Retained trees/hedges should have root protection zones clearly marked with fencing throughout the development works, e.g. Heras fencing. Fencing to follow British Standard BS5837:2012 Trees in Relation to design, demolition and construction.
- No spoil to be deposited or works to take place within the root protection zones of retained trees/hedges.

5.3.10 Grassland based habitats:

- Retained habitat to be fenced off using high visibility fencing.
- No plant storage, plant movement or material storage to take place on retained habitats without prior consultation with the Ecological Clerk of Works.
- If plant transit is necessary across retained habitat appropriate protective matting to be used in order to avoid soil compaction where required.

5.3.11 Air and waterborne pollution:

- Standard industry best practice in relation to construction sites and dust production/water pollution will minimise impacts to retained/adjacent habitats.

Bats

5.3.12 Lighting:

- No additional flood lighting to be used between sunset and sunrise without agreement with the Ecological Clerk of Works.

5.3.13 General building and structure demolitions.

- Buildings are considered to provide negligible to low opportunities for bats or bat roosts.

- All demolitions will require a pre-demolition check by the Ecological Clerk of Works to ensure no change to previous assessments and no indication of use by species ahead of works commencing.
- The inspection should be undertaken within 48 hours of the proposed demolition to ensure absence of bats and any other protected and notable species, such as nesting birds.
- If bats or evidence of roosting bats are found at any stage:
 - All works, that are likely to cause disturbance and/or within the zone of influence of the bats, MUST stop and not re-commence until advice has been received from the Ecological Clerk of Works/Ecological Manager.
 - Liaison with Natural England may be necessary.
 - A European Protected Species Licence may be necessary before works can re-commence.

Nesting Birds (General)

- 5.3.14 Works impacting upon grassland/trees/shrubs/hedgerows during the core nesting season (March to August inclusive):
- Immediately prior to works commencing (within 48 hours) an inspection by the Ecological Clerk of Works to check for any evidence of nesting or nest building birds. If evidence is found, works may be delayed.
- 5.3.15 Building demolitions:
- Immediately prior to works commencing (within 48 hours) an inspection by the Ecological Clerk of Works to check for any evidence of nesting or nest building birds. If evidence is found, works may be delayed
- 5.3.16 If nesting birds are found at any stage during construction works:
- All works that are likely to cause disturbance and/or within the zone of influence of the birds, MUST stop and not re-commence until advice has been received from the Ecological Clerk of Works/Ecological Manager.
 - Depending on the species, situation, stage of nesting and works in immediate vicinity it is likely that an exclusion zone will be put up around the nest and works will be stopped or restricted within the exclusion zone.

Nesting Birds (Schedule 1 Species)

- 5.3.17 With regard to peregrine falcon, prior to site works commencing during the bird nesting season (March to August inclusive);
- Prior to works commencing during breeding season advice from the licenced ecologists will be required to ensure construction stage works are undertaken in a manner that does not disturb the birds. Generally, the nest is at height but certain measures, such as reducing noise impacts at sensitive times, are likely to be required during the works programme.
 - The ECoW and licenced ecologist will advise accordingly based on timings, programme and proposed works.

- 5.3.18 Impacts to nesting peregrine could be generally minimised by programming of site works later in the summer, outside of the core peregrine nesting period (March to July). This would also reduce impacts to common nesting species while allowing for site clearance methods to proceed within the recommended period for other key species, as set out in the relevant sections below.

Reptiles

- 5.3.19 Mitigation measures in relation to loss of habitat areas known to support reptiles will include:
- Risk area mapping: As part of the assignment of risk areas (see Section 3.2), reptile risk areas will also be taken into consideration to ensure the appropriate level of mitigation is implemented as set out below.
- 5.3.20 The following works to be undertaken during the reptile active period – March to October inclusive.
- 5.3.21 Displacement:
- As only small areas of habitat on the periphery of retained core habitat areas (adjacent railway) are being affected, mitigation works will include displacement of reptiles from work areas into adjacent retained habitats through gradual reduction of vegetation in a phased/directional manner.
 - Such works would be conducted during the reptile/amphibian active period (March to October inclusive).
 - The works are described in detail below and will include directional clearance of vegetation and phased height reduction which will encourage displacement of reptiles (and other species) toward retained habitat features beyond the works area.
 - Such works would be planned and overseen by an ECoW.

Other fauna (including hedgehog)

- 5.3.22 Dependant of timing of works but likely to involve the following (this method is consistent with other vegetation clearance approaches for other fauna groups, e.g. reptiles and will run in tandem where necessary):
- 5.3.23 Phase 1:
- Check for presence of common/ widespread/ highly mobile fauna. Any animals present to be removed or encouraged to move to a place of safety following best practice at the time.
 - Vegetation to be cut to a height of 150 mm, in a continuous direction allowing any fauna to disperse. All cut material to be removed immediately off-site/to an area that will not be affected by the proposed works.
 - Check for potential refugia sites and dismantle with care and in a controlled manner. This typically needs to be completed using handheld tools.
 - Hedgehog:

- If active hedgehogs are encountered works that are likely to cause disturbance and/or within the zone of influence of the hedgehog MUST stop and not re-commence until advice has been received from the Ecological Clerk of Works/Ecological Manager.
- If required, the Ecological Clerk of Works will carefully move the hedgehog by hand from the construction area to nearby retained habitat features away from construction works.
- If a hibernating hedgehog is encountered (i.e. during the months of November to February) works MUST stop and the Ecological Clerk of Works will assess the situation. If the hedgehog can be left in-situ then the nesting material will be carefully replaced and suitable food/water will be left in the area as a precaution should the hedgehog come out of hibernation. The nest area will be monitored by the Ecological Clerk of Works until it is evident that that hedgehog has moved on. If the hedgehog is left in-situ then habitat connectivity must be maintained, i.e. it must not become isolated by being surrounded by areas of high-risk and/or low suitability. If there is an imperative reason for the clearance works to continue then the Ecological Clerk of Works would be required to carefully relocate the hedgehog within its nesting material to an appropriately sheltered location away from the works area. Food and water would be left in the vicinity of the relocation site as a precaution should the hedgehog come out of hibernation.

5.3.24 Phase 2:

- Second check for presence of common/widespread/highly mobile fauna. Any animals present to be removed to a place of safety following best practice at the time (see above for hedgehog requirements).
- Vegetation to be cut to ground level.

5.3.25 Phase 3:

- Vegetation to be maintained short at ground level until works commence within the area to ensure that it remains unfavourable for common/widespread/highly mobile fauna that may re-disperse into the area. Use of appropriate/approved herbicide may be acceptable; to be determined by the Ecological Manager/Landscape Architect at the time. If vegetation starts to grow the area will need to be re-checked for the presence of fauna before works commence.

5.3.26 Throughout construction period:

- Creation of habitat that fauna (including small animals, reptiles/amphibians) may use for refuge, e.g. piles of construction material or loose-packed spoil, to be avoided.
- If evidence of specifically protected species comes to light during the development, then works that are likely to cause disturbance and/or within the zone of influence of the animals should stop until advice has been sought from the Ecological Clerk of Works.

6. CONCLUSIONS

6.1.1 Based on the current study:

- No further surveys are considered necessary in order for the LPA to validate/grant planning permission.
- The Site falls within IRZ of two SSSIs; Natural England will need to be consulted on any development taking place on this Site as the development type is listed as potentially damaging to the designated features. Generally, the SSSI's are distant/separated from the Site and as such significant direct impacts are not anticipated at this stage.
- No Non-statutory Nature Conservation Sites will be negatively impacted by the proposed works.
- No S41/Priority Habitats will be negatively impacted by the proposed works.
- No protected or notable species will be negatively impact if appropriate mitigation and precautions are followed, as set out in this report.
- The proposed works have the potential to provide biodiversity enhancement through implementation of a series of enhancements as set out in this report.

7. REFERENCES AND BIBLIOGRAPHY

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8. GLOSSARY

8.1 Scientific Terms and Acronyms

Badger sett An underground complex of tunnels utilised by badger as a den and accessed by one or more entrances at ground surface level.

BoCC Birds of Conservation Concern, the UK Red-list for birds, produced by the British Trust for Ornithology and last updated in December 2015.

CIEEM Chartered Institute of Ecology and Environmental Management, the professional organisation and provider of professional codes of conduct for ecological consultancy.

CSZ Core Sustenance Zone *“the area surrounding a communal bat roost within which habitat availability and quality will have a significant influence of the resilience and conservation status of the colony using the roosts”* (Collins, 2016).

Defunct hedgerow A hedgerow which is not stock proof without the need for fencing.

EPS European Protected Species For the purposes of this report EPS are species that require particular licences to allow certain works to go ahead. Species falling within the following situations are not considered as EPS within this report:

Birds listed on Appendix 2 of the Bern Convention (European legislation). The protection requirements of this Appendix are fully integrated in UK law, notably through the Wildlife and Countryside Act 1981 (as amended).

Birds listed on Annex 1 of the Birds Directive (European legislation). The protection of such species survival and reproduction within their geographic distribution is ensured through special conservation measures in relation to their habitats. Such measures are implemented through the establishment of Special Protection Areas. Therefore, any implications are considered at regional habitat and country level rather than individual bird/species level.

FEP Farm Environment Plan.

HERC Herts Environmental Records Centre

Important hedgerow Any hedgerow which has existed for 30 years or more and satisfies a number of criteria listed within Part II of Schedule 1 to the Hedgerow Regulations 1997. For the purposes of this report, only wildlife and landscape criteria are considered; archaeological and historical criteria are not assessed.

Intact hedgerow A hedgerow which is stock proof with the need for fencing.

LBAP Local Biodiversity Action Plan.

Level of protection – ‘EU’ Protected under the Conservation of Habitats and Species Regulations (2017).

Level of protection – ‘UK’ Protected under the Wildlife and Countryside Act 1981 (as amended).

LNR Local Nature Reserve. Statutory designation.

NNR National Nature Reserve. Statutory designation.

Non-native invasive species For the purposes of this report: species listed on Schedule 9 of the wildlife and Countryside Act 1981 (as amended). Widely naturalised species, such as grey squirrel, are excluded.

Notable species A species which is listed as a UK Priority Species, carries an unfavourable conservation status (e.g. scarce, rare, threatened, Red-listed), is invasive or is otherwise worthy of note from an ecological perspective.

NR Nationally Rare. Defined as a species which occurs in 15 or fewer hectads in Great Britain. Excludes rare species qualifying under the main IUCN criteria.

NS Nationally Scarce. Defined as a species which occurs in 16-100 hectads in Great Britain. Excludes rare species qualifying under the main IUCN criteria.

OMH Open Mosaic Habitat. A UK Priority Habitat characterised generally by a mosaic of colonising vegetation on previously developed land with loose and/or sandy soil. Generally of significantly elevated value to invertebrates.

PRF Potential Roost Feature. A feature on a building or tree that has potential to support roosting bats.

Protected species A species protected under specific UK or European legislation, including Habitats Directive, Wildlife and Countryside Act.

PTES Peoples Trust for Endangered Species

SAC Special Area of Conservation. Designated under European Union Habitat Directive (92/43/EEC) to protect species and habitat of European interest.

SPA Special Protection Area. A site designated under the European Union Directive on the Conservation of Wild Birds.

SSSI Site of Species Scientific Interest. Statutory designation of biological or geological importance.

UK Priority Habitat and species A habitat or species identified as a priority for conservation in accordance with Section 41 of the Natural Environment and Rural Communities Act (2006). Section 40 of the Act places a duty on public authorities to have regard for the conservation objectives of these habitats and species. (Also known as Section 41 (S41) habitats/species).

8.2 Bat Specific Terminology

8.2.1 The following categories are used to describe the level of roosting potential of buildings and trees; these are based on current best practice (adapted from Table 4.1, p. 35; Collins, 2016):

- **Negligible:** Negligible features within the building likely to be used by roosting bats.
- **Low:** A structure with one or more PRFs that could be used by individual bats opportunistically. However, these potential roost Sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation).
- **A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.**
- **Moderate:** A structure or tree with one or more PRFs that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status.
- **High:** A structure or tree with one or more PRFs that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
- **Confirmed Roost:** Presence of bats or evidence of use by bats.

8.2.2 Bats have different types of roost at different stages in their life cycle and at different times of year. Table 8.1 details terms are used to describe types of bat roosts. These descriptions are based on current best practice (Collins, 2016 and Hundt, 2012).

Table 8.1 Description of different types of roosts used by bats

Roost type	Period when used	Used by	Other comments
Transitional/ occasional	April – September/October a few days prior or following hibernation	A few individuals (occasional small groups) for (generally) short periods of time.	Used prior to hibernation or when wake for short periods during hibernation. Roosts are generally cool.
Maternity	May – August	Breeding females (females & dependent young).	Males rarely present, although male long- eared bats, Daubenton's, Natterer's, horseshoe bats have been found in maternity roosts with numbers increasing through the active season.
Satellite	May – August	Females. A few to small groups.	Located near maternity roosts & used by females as an alternative roost site.
Mating	Late summer to through winter	Mating individuals.	Used by males of some species that defend a territory and display/call females to mate.
Hibernation	October - March	All. May get different species using same roost.	Cool, constant temperature with high humidity.
Night	March – November	Single individual on occasion or regularly used by a colony to rest/shelter during the night.	May be of high value to some species, such as lesser horseshoe, providing key resting places with forging areas.
Day	March – November (rarely found by night in summer)	Single bat or few individuals (males) for resting/shelter during the day.	Bats may have several day roosts, regularly used, switching daily or one used for several weeks at a time.
Feeding	May – November	Single bat or few individuals or a colony for resting/feeding at night. Rarely present during the day.	Often used by long-eared and horseshoe bats.
Swarming Sites	Late summer/autumn	Large numbers of different species (both sexes) gather.	Generally, around caves & mines. Often dominated by Myotis bats. Potentially important mating sites with bats travelling many kilometres to use. Some bats may remain to hibernate.

8.3 Scientific Names

8.3.1 Scientific names of species mentioned in this report are outlined in Table 8.2. This table excludes species recorded on Site; see Appendix E.

Table 8.2 Scientific names of species mentioned within this report

English Name	Scientific Name
Amphibians & Reptiles	
Great crested newt	<i>Triturus cristatus</i>
Slow worm	<i>Anguis fragilis</i>
Bats	
Brown long-eared bat	<i>Plecotus auritus</i>
Common pipistrelle	<i>Pipistrellus pipistrellus</i>
Soprano pipistrelle	<i>Pipistrellus pygmaeus</i>
Birds	
Barn Owl	<i>Tyto alba</i>
Brambling	<i>Fringilla montifringilla</i>
Common Crossbill	<i>Loxia curvirostra</i>
Fieldfare	<i>Turdus pilaris</i>

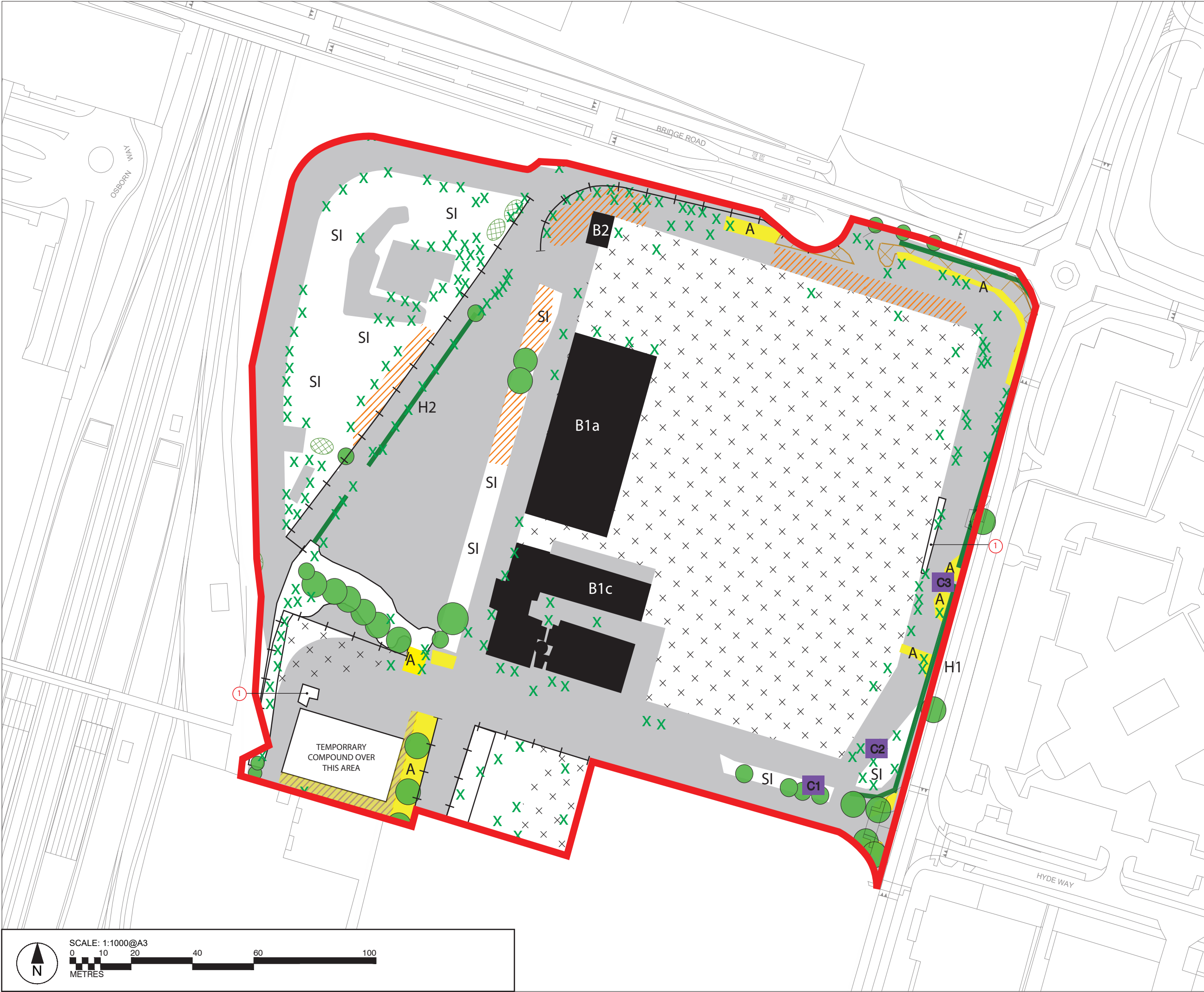
English Name	Scientific Name
Firecrest	<i>Regulus ignicapilla</i>
Green Sandpiper	<i>Tringa ochropus</i>
Grey partridge	<i>Perdix perdix</i>
Hen Harrier	<i>Circus cyaneus</i>
Hobby	<i>Falco subbuteo</i>
Kingfisher	<i>Alcedo atthis</i>
Osprey	<i>Pandion haliaetus</i>
Peregrine	<i>Falco peregrinus</i>
Red Kite	<i>Milvus milvus</i>
Redwing	<i>Turdus iliacus</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Common (Mealy) Redpoll	<i>Acanthis flammea</i>
Common Gull	<i>Larus canus</i>
Common Sandpiper	<i>Actitis hypoleucos</i>
Cuckoo	<i>Cuculus canorus</i>
Curlew	<i>Scolopax arquata</i>
Gadwall	<i>Mareca strepera</i>
Grey Heron	<i>Ardea cinerea</i>
Grey Wagtail	<i>Motacilla cinerea</i>
House Martin	<i>Delichon urbicum</i>
House Sparrow	<i>Passer domesticus</i>
Kestrel	<i>Falco tinnunculus</i>
Lapwing	<i>Vanellus vanellus</i>
Lesser Redpoll	<i>Acanthis cabaret</i>
Lesser Spotted Woodpecker	<i>Dryobates minor</i>
Linnet	<i>Linaria cannabina</i>
Marsh Tit	<i>Poecile palustris</i>
Mistle Thrush	<i>Turdus viscivorus</i>
Sand Martin	<i>Riparia riparia</i>
Shoveler	<i>Spatula clypeata</i>
Skylark	<i>Alauda arvensis</i>
Snipe	<i>Scolopacidae sp.</i>
Song Thrush	<i>Turdus philomelos</i>
Spotted Flycatcher	<i>Muscicapa striata</i>
Stock Dove	<i>Columba oenas</i>
Swift	<i>Apus apus</i>
Tawny Owl	<i>Strix aluco</i>
Teal	<i>Anas crecca</i>
Tree Sparrow	<i>Passer montanus</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Woodcock	<i>Scolopax rusticola</i>
Yellowhammer	<i>Emberiza citrinella</i>
Yellow wagtail	<i>Motacilla flava</i>
Invertebrates	
Dot moth	<i>Melanchra persicariae</i>
Dusky thorn	<i>Ennomos fuscantaria</i>
Ear moth	<i>Amphipoea oculatea</i>
Knot grass	<i>Acronicta rumicis</i>
Beautiful knot-horn	<i>Rhodophaea formosa</i>
Little emerald	<i>Jodis lactearia</i>
White satin moth	<i>Leucoma salicis</i>

English Name	Scientific Name
Mammals	
Badger	<i>Meles meles</i>
Hazel Dormouse	<i>Muscardinus avellanarius</i>
West-European hedgehog	<i>Erinaceus europaeus</i>
Plants	
Hornbeam	<i>Carpinus</i> sp.
Indian beam	<i>Catalpa bignonioides</i>
Japanese Knotweed	<i>Reynoutria japonica</i>
Oak	<i>Quercus</i> sp.
Wild service tree	<i>Sorbus torminalis</i>

APPENDICES

PLANS AND SITE PHOTOGRAPHS

Drawing BMD.20.019.DR.902: Phase 1 Habitat Survey



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KEY:

- Site boundary
- B1** Building/structure
- Hardstanding
- A** Former amenity grassland (rank)
- Tall ruderal
- Ephemeral/short perennial disturbed land
- SI Poor semi-improved grassland
- ① Bare/re-colonizing ground
- Tree
- Scattered scrub
- Dense/continuous scrub
- Cultivated/disturbed introduced shrub
- Species-poor intact hedge
- C** Cotoneaster sp
- Fencing

Rev	Description	Date

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Client
PLUTUS ESTATES (WGC) LIMITED

Project
WHEAT QUARTER NORTH SITE REAPP

Drawing Title
PHASE 1 HABITAT SURVEY

Drawn GM	Checked JP	Approved JP	Date 28.09.20
Job No. 20.019	Scale 1:1000	Sheet Size A3	Revision
Drawing Number BMD.20.019.DR.902			-

PHOTO SHEETS



Photograph 1: Building B1a



Photograph 2: Building B1a internal – upper levels



Photograph 3: Building B1c



Photograph 4: B1c internal area beneath Silos



Photograph 5: Building B2 (formerly north-west corner of B1a)



Photograph 6: Example of recently cleared areas with patches of colonising vegetation



***Photograph 7: North-western grassland area,
looking south through area***

A. POLICY, LEGISLATION AND GUIDANCE

A.1 Overview

A.1.1 Tables A1.1 and A1.2 provide a summary of wildlife legislation and policy of relevance to development at the Site.

Table A1.1 Overview of species/species groups relevant to the current proposals and associated legislation and policy

Species/Species group	European	UK ¹	Priority species ²
Amphibians		Various	Incl. common toad
Bats (all species)	✓	Full	Species dependent
Birds		Full	Species dependent, incl. House sparrow
Invasive species	✓	✓	Various
Invertebrates	Various	Various	Various, incl stag beetle
Mammals (general)		Species-dependent	Incl. hedgehog
Plants	Various	Species-dependent	Various
Reptiles (excluding sand lizard and smooth snake)		Partial – incl. killing and injury	✓
Notes ¹ Principally the Wildlife and Countryside Act: Full = full protection, either from the Wildlife and Countryside Act 1981 (as amended) alone or in combination between this act and European legislation; partial = partially protected. ✓ = covered by other specific legislation. ² Includes over 900 species listed in accordance with section 41 of the NERC Act (2006). Species known or most likely to utilise the Site are indicated where appropriate.			

Table A1.2 Relevant species legislation for development at the Site

Species / group	Legislation ^{see notes}											
	1	2	3	4	5	6	7	8	9	10	11	12
Amphibians								✓				
Bats (all species)			✓		✓		✓	✓				✓
Birds (nesting)	✓	✓						✓				
Invasive species						✓			✓	✓	✓	
Invertebrates								✓				
Hedgehog					✓			✓				✓
Plants								✓				
Reptiles				✓				✓				
Notes												
¹ Wildlife and Countryside Act, 1981 (as amended) – Part 1												
² Wildlife and Countryside Act, 1981 (as amended) – Schedule 1 (some species)												
³ Wildlife and Countryside Act, 1981 (as amended) – Schedule 5, Section 9 (4b, 4c) and (5)												
⁴ Wildlife and Countryside Act, 1981 (as amended) – Schedule 5, Section 9 (1, in respect of killing and injuring) and (5)												
⁵ Wildlife and Countryside Act, 1981 (as amended) – Schedule 6, Section 11												
⁶ Wildlife and Countryside Act, 1981 (as amended) – Schedule 9, Section 14												
⁷ Conservation of Habitats and Species Regulations 2017 – Schedule 2 (European protected species)												
⁸ Natural England and Rural Communities Act (2006) – Various species listed in accordance with Section 41												
⁹ Invasive Species regulations: EU Regulation (1143/2014) on invasive alien (non-native) species												
¹⁰ Anti-social Behaviour, Crime and Policing Act 2014												
¹¹ Environmental Protection Act 1990												
¹² Wild Mammals (Protection) Act 1996												

A.1.2 The key national planning policies and documents are:

- The National Planning Policy Framework (2019); and
- The Natural Environment and Rural Communities (NERC) Act (2006).

B. ASSESSMENT METHODOLOGIES

B.1 Desk Study

B.1.1 The desk study involved:

- Gathering and analysing existing ecological data within the Site boundary and extending to a radius of 1-5 km; and
- Reviewing readily available habitat data within 1 km radius of the Site boundary.

B.1.2 The results of the desk study were used to aid in the interpretation of the survey results and were obtained from the following sources:

- Previous ecology surveys;
- Herts Environmental Records Centre;
- Local specialists groups - HMBG Bat Group;
- The Multi-Agency Geographical Information for the Countryside (*MAGIC*) – web-based database;
- The Woodland Trust Ancient Tree Inventory;
- Natural England Great crested newt class licence database and District Licencing database;
- People’s Trust for Endangered Species Big Hedgehog Map – web-based citizen science database of hedgehog sightings.
- Readily available maps (modern and historic);
- Readily available aerial photographs.

B.1.3 In terms of species, particular attention was given to the following species/species groups:

- Amphibians;
- Badgers;
- Bats;
- Birds;
- Invertebrates (as appropriate based on geographic location and habitats present on Site);
- Invasive species (as listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended));
- Plants (as appropriate based on geographic location and habitats present on Site);
- Reptiles.

B.1.4 Some species, such as the blue tit, may be listed on red data books but described as neither threatened nor near threatened; such species are not included in the protected and notable species tables within the desk study sections. Species listed solely on Schedule 5 Section 9(5)a and 9(5)b are not considered to be protected species in the context of this report as offences detailed in these Sections relate to sale/intention to sell.

B.1.5 For the purposes of this report species falling within the following situations are not indicated as having European level of protection in the desk study tables:

- Birds listed on Appendix 2 of the Bern Convention (European legislation). The protection requirements of this Appendix are fully integrated in UK law, notably through the Wildlife and Countryside Act 1981 (as amended).
- Birds listed on Annex 1 of the Birds Directive. The protection of such species survival and reproduction within their geographic distribution is ensured through special conservation measures in relation to their habitats. Such measures are implemented through the establishment of Special Protection Areas. Therefore, any implications are considered at regional habitat and country level rather than individual bird/species level.

B.1.6 For the purposes of this report widely naturalised non-native invasive species listed in Schedule 9 of the Wildlife and County Act, such as grey squirrel and muntjac, are excluded.

B.2 Extended Phase 1 Habitat Survey

B.2.7 The Extended Phase 1 Habitat Survey involved a walk-over of the Site recording and mapping the various habitats present (as defined by and in line with the standard methodology in JNCC, 2010) in each definable land parcel. Where applicable, land parcels were separated into their component habitats. In addition to the floristic component of each habitat or habitat parcel (where it had a different character), each was described in terms of its likely origin (e.g. self-established, planted), character, condition and management. The condition of the habitat was determined using professional judgement and criteria used to inform FEPs.

B.2.8 Attention was also paid to the presence or potential for protected and notable species occurring on Site. This focused on the species/species groups as listed in paragraph B1.3.

B.2.9 Target notes were used to aid the interpretation of mapped habitats to indicate notable features within the Site.

B.3 Initial Bat Scoping Assessment

B.3.1 The Site was assessed for the likelihood of it supporting roosting bats or of being of value to bats roosting off-Site in the local area. The assessment followed current best practice (Bat Conservation Trust, Collins 2016) and took the following into consideration:

- Habitat context (the overall Site and its wider surroundings were evaluated for the potential to support commuting and/or foraging bat species);
- Light levels;
- Temperature stability;
- Protection from the elements;
- Access for bats into the interior of the building; and
- Potential roost Sites in external and internal features of the building.

Habitats

- B.3.2 A habitat assessment of the Site and immediate environs (up to 5 km) for its value to foraging and commuting bats was undertaken. This primarily utilised readily available aerial photography and maps. The purpose of this element is to enable an assessment of the relative value of the Site for bats in the local landscape.

Buildings and structures

- B.3.3 All buildings and structures were inspected, both externally and internally (where safe access permitted), for their potential to support bats.
- B.3.4 The buildings and structures were thoroughly searched for signs of bats; including:
- absence of cobwebs (high/dense occurrence of cobwebs often, although not conclusively, suggest no/limited bat use of features/roof voids);
 - potential access and egress routes for bats into and out of likely roosting sites (internally such features may be indicated by light shining into internal building voids from the exterior of the building or damage to the internal lining of the roof);
 - evidence of the use of potential access points by bats, such as scattered droppings, urine staining or scratching around entrances;
 - actual bats (live, corpses or skeletons);
 - feeding remains such as moth and butterfly wings;
 - bat droppings; and
 - potential roosting locations as bats and their signs are not always visible.
- B.3.5 Certain features and areas within buildings have stronger associations with finding bat evidence. Therefore, these locations were the focus of the survey, including but not restricted to:
- Dividing walls/chimney breasts;
 - Underneath ridge beams;
 - Beneath hip joins and junctions; and
 - Timber/wall joints.

Trees

- B.3.6 Trees with potential to support roosting bats were assessed from ground level.
- B.3.7 Holes, crevices, hollows and cracks were inspected for their suitability for bats (e.g. dry and not exposed to the elements) evidence of bats (notably actual bats, droppings and urine stains).

B.4 Evaluation

Habitats

- B.4.8 The habitats were assessed against the criteria and descriptions of Priority Habitats to determine if they could be considered as Priority Habitat and, therefore, likely to have greater implication on developing the Site.
- B.4.9 Habitats were also considered in relation to their wider landscape integration, notably connectivity and acting as a buffer to other habitats or protected sites.
- B.4.10 The habitat condition assessments and valuation used to inform FEP are also used in Biodiversity Impact Assessment Matrices. Therefore, have been used in this Ecological Assessment to help determine the importance of the habitats within the Site. In the majority of cases habitats were assessed at Site or local level. Exceptions may be where the habitats are good examples of a Priority habitat or a localised/rare habitat in the area whereby they may be considered at District or National level. Descriptions of national and local Priority Habitats will be used to value habitats on Site.

Species

- B.4.11 The Site was assessed in terms of its potential to support protected and notable species with particular attention being paid to those listed in paragraph B1.3. It takes account of habitats present on Site, the desk study species data, connectivity to known records and other suitable habitat and geographic range of species. For example, a Site may have suitable habitat for sand lizard but is outside the species geographic distribution and as such would not be considered in the evaluation of the Site. Another example would be if water vole were returned in the desk study data but there was no watercourse within the site or within a zone of influence which may be indirectly affected by pollution run-off.

C. METADATA, SURVEY CONDITIONS AND LIMITATIONS

C.1 Metadata

Factor	Detail
Data	Habitats described and mapped in accordance to JNCC (2010). Target notes of specific features. Bats: Landscape habitat review, habitat assessment, structure and tree assessment.
Reason for collection	To provide baseline ecological data to inform master planning, planning applications and appropriate mitigation in relation to proposed development.
Location	Wheat Quarter North Site ReApp, Hertfordshire, AL7 3BU, approximate central grid reference: TL24131295.
Date	14/07/2020
Method of collection	Phase 1 Habitat Survey: JNCC (2010). Initial bat assessments following current best practice (Collins, 2016).
Who collected	James Patmore CEng CEnv MCIEEM Laura McManus BSc (Hons) MSc

C.2 Survey Conditions

Date	Start Time	Preceding days	Cloud (%)	Sun	Temp. (°C)	Precipitation	Wind (Beaufort scale)
14/07/2020	09:00-13:00	Sunny & warm	75	Some sunny spells	23	No rain	1

C.3 Limitations Review

Consideration	Comment
Survey & data	
Personal competence, i.e. qualifications, training, skills, understanding, experience	All survey works were undertaken by or directly supervised by personnel experienced in ecological surveying and licensed to undertake great crested newt surveys (see meta data; Section C1). <u>James Patmore</u> CEcol CEnv MCIEEM has over 18 years' experience in ecological consultancy, including an extensive amount of experience performing and directing the survey work and assessments undertaken at the Site. Bat class licence holder, level 2. <u>Laura McManus</u> BSc (Hons) MSc has over four years of experience undertaking ecological surveys and fieldwork. This includes a suitable level of experience with all surveys undertaken at the Site.
Resources (equipment and/or personnel)	Appropriate resources and suitably qualified personnel were used.
Time spent surveying	Sufficient time was spent on site to undertake all surveys. No surveys were 'cut short'.
Data (e.g. arising from incomplete or inappropriate surveys)	The data used and collected were sufficient for the purpose of the works. The data held by PTES on the Big Hedgehog Map is the output of various surveys including citizen science and as such a degree of caution should be applied when depending solely on these data to inform impacts as data may not have been verified.
Lack of statistical robustness and higher uncertainties	Statistical analysis of data was not deemed necessary for the purpose of the current works. Graphs of newts recorded per survey gives an indication of population peaks over the survey period.
Old and out of date data	The survey data in this report remains valid until July 2021.
Timing or seasonal constraints and suboptimal survey periods	The survey was conducted in July 2020. This is an appropriate survey period.
Partial use of and/or departures from good practice guidelines	All surveys accorded with the relevant best practice guidelines.
Site conditions & other factors	
Adverse weather conditions	No significantly adverse weather conditions were encountered during the survey work undertaken at the Site that would be considered to have significantly adversely impacted the reliability and accuracy of data collected.
Restricted access to site or part of site	Access was not restricted. Some parts of the buildings were not accessible to undertake a full direct search for evidence of bats.
Unrealistic deadlines	No restrictions on survey data collected or analysed to date are as a result of unrealistic deadlines.
Unproven or untested measures for mitigation and compensation	N/A
Evaluation of conservation value and impacts	The evaluation of the conservation value of habitats and species associated (or potentially associated) with the site and impacts of the development, are based on the current information available. This evaluation will need to be reviewed and updated as necessary should a considerable period of time (24 months) elapse and/or more data from other survey work (on and within 500 m of the site) becomes available.

D. DESK STUDY SCOPING EXERCISE

- D.1.1 A data search on *MAGiC* and other web-based data sources was completed on 15th July 2020. A summary of features checked is provided in Tables D1.1. to D1.6.
- D.1.2 A review of the Woodland Trust Ancient Tree Inventory highlighted the following known ancient, veteran or notable trees within or adjacent to the Site:

Table D1.1 Ancient, veteran or notable trees within 1 km of the Site

Species	Tree type	Direction ¹	Distance ²	WT Ref. Number ³
Wild service tree	Veteran	NW	450	140696
Indian beam	Notable	W	800	28785
Oak	Notable	W	800	28786
Hornbeam	Ancient	SW	600	60843
Notes 1. Direction from the approximate centre of the Site. 2. Distance from the approximate centre of the Site to the nearest 50 m. 3. Woodland Trust reference number (Tree ID).				

Table D1.2 Statutory nature conservation sites within 2 km of the Site (extending to 5 km for sites designated for bats)

Site designation	Number of sites				
	Total	On Site	0-1 km	1-2 km	2-5 km
AONB	0	0	0	0	0
LNR	2	0	0	1	1
NNR	0	0	0	0	0
National Park	0	0	0	0	0
Ramsar	0	0	0	0	0
SSSI	1	0	0	1	0
SAC	0	0	0	0	0
SPA	0	0	0	0	0
Impact Risk Zone	Yes – Sherrardspark Wood SSSI & Tewinbury SSSI				

Table D1.3 Priority (and notable) habitats within 1 km of the Site

Broad category	Priority Habitat Inventory	Other habitats	On Site	0-1 km
Coastal	Saltmarsh		0	0
	Sand Dunes		0	0
	Vegetated Shingle		0	0
	Maritime Cliffs and Slopes		0	0
	Mudflats		0	0
	Saline Lagoons		0	0
Grassland	Calaminarian Grassland		0	0
	Coastal and Floodplain Grazing Marsh		0	0
		Good quality semi-improved grassland (non-priority)	0	0
	Lowland Calcareous Grassland		0	0
	Lowland Dry Acid Grassland		0	0
	Lowland Meadows		0	0

Broad category	Priority Habitat Inventory	Other habitats	On Site	0-1 km
	Purple Moor Grass and Rush Pasture		0	0
	Upland Calcareous Grassland		0	0
	Upland Hay Meadows		0	0
Heath	Lowland Heathland		0	0
	Mountain Heaths and Willow Scrub		0	0
	Upland Heathland		0	0
Limestone pavements	Limestone Pavements		0	0
Marine	Intertidal Substrate Foreshore		0	0
Wetland	Blanket Bog		0	0
	Lowland Fens		0	0
	Lowland Raised Bog		0	0
	Reedbeds		0	0
	Upland Flushes, Fens and Swamps		0	0
Woodland		Ancient: Semi-natural	0	1 parcel
		Ancient: Replanted	0	0
	Deciduous Woodland		0	7 blocks of 30 parcels
		National Inventory of Woodland & Trees ¹	0	6 blocks of 7 parcels
	Traditional Orchards		0	0
	Wood pasture and Parkland BAP Priority Habitat		0	0
Trees ²		Ancient, veteran or notable trees	0	4
Other		Fragmented heath (Non Priority)	0	0
		Grass Moorland (Non Priority)	0	0
		No main habitat but additional habitat exists	0	1 block of 2 parcels
	Open Mosaic Habitat		0	1 parcel
Notes 1. Not notable habitats but provide information to guide mitigation 2. Woodland Trust Ancient Tree Inventory				

Table D1.4 European Protected Species licence applications within 1 km and (5 km for bats) of the Site. NB excluding GCN, see Table D1.5.

Protected species licence applications	Number of applications Total	On Site	0-1 km	1-2 km	2-5 km
Bat					
Species covered by the bat licences					
Alcathoe bat					
Barbastelle					
Bechstein's bat					
Brandt's bat					
Brown long-eared bat	7				✓
Common pipistrelle	7				✓
Daubenton's bat					
Greater horseshoe bat					

Protected species licence applications	Number of applications	On Site	0-1 km	1-2 km	2-5 km
	Total				
Grey long-eared bat					
Leisler's bat					
Lesser horseshoe bat					
Nathusius pipistrelle					
Natterer's bat					
Noctule					
Pipistrelle sp.					
Serotine					
Soprano pipistrelle	3				✓
Whiskered bat					

Table D1.5 Great crested newt data within 1 km of the Site

Data source	Number of records		
	Total	On Site	0-1 km
NE Class licence database ¹	0	0	0
NE country-wide survey data ²	0	0	0
Development licenses ²	0	0	0
Notes 1. Downloaded February 2020 2. As depicted on <i>MAGIC</i>			

Table D1.6 Notable fauna in relation to the Site

Species	On Site	0-1 km
Farmland bird assemblages¹		
Arable (max number of species)	0	0
Grassland (max number of species)	0	0
Black grouse		
Cirl bunting		
Corn bunting		
Curlew		
Grey partridge		✓
Lapwing		
Redshank		
Snipe		
Stone curlew		
Tree sparrow	✓	✓
Turtle dove		
Twite		
Yellow wagtail		✓
Mammals		
European hedgehog ²		✓
Notes 1. As depicted on <i>MAGIC</i> 2. As depicted on the Big Hedgehog Map (PTES, 2020).		

E. DETAILED SURVEY RESULTS

E.1 Species Recorded on Site

English Name	Scientific Name
Birds	
Dunnock	<i>Prunella modularis</i>
Goldfinch	<i>Carduelis carduelis</i>
Feral pigeon	<i>Columba livia domestica</i>
Peregrine falcon	<i>Falco peregrinus</i>
Starling	<i>Sturnus vulgaris</i>
Wood pigeon	<i>Columba palumbus</i>
Invertebrates	
Gatekeeper butterfly	<i>Pyronia tithonus</i>
Large white butterfly	<i>Pieris brassicae</i>
Large skipper butterfly	<i>Ochlodes sylvanus</i>
Peacock butterfly	<i>Aglais io</i>
Mammals	
Red fox	<i>Vulpes vulpes</i>
Plants	
Bramble	<i>Rubus fruticosus</i>
Bent	<i>Agrostis</i> sp.
Birch	<i>Betula</i> sp.
Birds foot trefoil	<i>Lotus corniculatus</i>
Black horehound	<i>Ballota nigra</i>
Black medick	<i>Medicago lupulina</i>
Barren brome	<i>Bromus sterilis</i>
Bristly oxtongue	<i>Helminthotheca echioides</i>
Broad leaved dock	<i>Rumex obtusifolius</i>
Buddleia	<i>Buddleja davidii</i>
Canadian fleabane	<i>Erigeron canadensis</i>
Canadian goldenrod	<i>Solidago canadensis</i>
Clematis	<i>Clematis</i> sp.
Colts foot	<i>Tussilago farfara</i>
Common bent	<i>Agrostis capillaris</i>
Common centaury	<i>Centaurium erythraea</i>
Common chickweed	<i>Stellaria media</i>
Common mallow	<i>Malva neglecta</i>
Common ragwort	<i>Jacobaea vulgaris</i>
Copper beech	<i>Fagus sylvatica</i>
Cotoneaster	<i>Cotoneaster</i> sp.
Cow parsley	<i>Anthriscus sylvestris</i>
Creeping cinquefoil	<i>Potentilla reptans</i>
Creeping thistle	<i>Cirsium arvense</i>
Dock	<i>Rumex</i> sp.
Dog rose	<i>Rosa canina</i>
Elder	<i>Sambucus nigra</i>
Evening primrose	<i>Oenothera biennis</i>
False oat grass	<i>Arrhenatherum elatius</i>
Fire thorn	<i>Pyracantha coccinea</i>
Great willowherb	<i>Epilobium hirsutum</i>

English Name	Scientific Name
Ground ivy	<i>Glechoma hederacea</i>
Hawthorn	<i>Crataegus monogyna</i>
Hedge bindweed	<i>Calystegia sepium</i>
Hedge woundwort	<i>Stachys sylvatica</i>
Hemlock	<i>Conium maculatum</i>
Hornbeam	<i>Carpinus betulus</i>
Horse chestnut	<i>Aesculus hippocastanum</i>
Knotgrass	<i>Polygonum aviculare</i>
Lambs ear	<i>Stachys byzantina</i>
Lesser burdock	<i>Arctium minus</i>
Lilac	<i>Syringa</i> sp.
Lime	<i>Tilia</i> sp.
Meadow buttercup	<i>Ranunculus acris</i>
Meadow grass	<i>Poa annua</i>
Meadow vetchling	<i>Lathyrus pratensis</i>
Mexican orange	<i>Choisya</i> sp.
Mugwort	<i>Artemisia</i> sp.
Mullein	<i>Verbascum thapsus</i>
Narrow leaved ragwort	<i>Senecio inaequidens</i>
Nettle	<i>Urtica</i> sp.
Oak	<i>Quercus robur</i>
Oxeye daisy	<i>Leucanthemum vulgare</i>
Perennial rye grass	<i>Lolium perenne</i>
Perforate St John's wort	<i>Hypericum perforatum</i>
Poplar	<i>Populus</i> sp.
Poppy	<i>Papaveroideae</i> sp.
Prickly lettuce	<i>Lactuca serriola</i>
Prickly sow thistle	<i>Sonchus asper</i>
Privet	<i>Ligustrum</i> sp.
Ribwort plantain	<i>Plantago lanceolata</i>
Rosebay willowherb	<i>Chamerion angustifolium</i>
Self-heal	<i>Prunella vulgaris</i>
Silver birch	<i>Betula pendula</i>
Smoke tree	<i>Cotinus</i> sp.
Soft brome	<i>Bromus hordeaceus</i>
Square stalked willowherb	<i>Epilobium tetragonum</i>
St. John's wort	<i>Hypericum</i> sp.
Swedish whitebeam	<i>Sorbus intermedia</i>
Sycamore	<i>Acer pseudoplatanus</i>
Tansy	<i>Tanacetum vulgare</i>
Teasel	<i>Dipsacus</i> sp.
Thistle	<i>Cirsium</i> sp.
Timothy-grass	<i>Phleum pratense</i>
Weeping silver birch	<i>Betula pendula</i> subsp. <i>Tristis</i>
Weld	<i>Reseda luteola</i>
Wild strawberry	<i>Fragaria vesca</i>
Willow	<i>Salix</i> sp.
Willowherb	<i>Epilobium</i> sp.
Woolly thistle	<i>Cirsium eriophorum</i>
Yarrow	<i>Achillea millefolium</i>

English Name	Scientific Name
Yorkshire fog	<i>Holcus lanatus</i>