Symmetry Park, North Oxford

Technical Appendix 8.1: Ecological Baseline

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The Environmental Dimension Partnership Ltd

On behalf of:
Tritax Symmetry Ltd and Siemens Healthineers

November 2021
Report Reference
edp2425_r007b

Contents

Annexes

Plans

Plan EDP 4	Pilot Winter Bird Survey – November 2018 (edp2425_d022b 23 November 2021 GY/TW)
Plan EDP 5	Breeding Bird Survey – April 2018 (edp2425_d023b 23 November 2021 GY/TW)
Plan EDP 6	Breeding Bird Survey – May 2018 (edp2425_d024b 23 November 2021 GY/TW)
Plan EDP 7	Breeding Bird Survey – June 2018 (edp2425_d025b 23 November 2021 GY/TW)
Plan EDP 8	Breeding Bird Survey – April 2021 (edp2425_d026b 23 November 2021 GY/TW)
Plan EDP 9	Bat Activity Survey – April 2018 (edp2425_d029b 24 November 2021 GY/TW)
Plan EDP 10	Bat Activity Survey – June 2018 (edp2425_d030b 24 November 2021 GY/TW)
Plan EDP 11	Bat Activity Survey – August 2018 (edp2425_d031b 24 November 2021 GY/TW)
Plan EDP 12	Bat Activity Survey – May 2021 (edp2425_d032b 24 November 2021 GY/TW)
Plan EDP 13	Bat Activity Survey – July 2021 (edp2425_d033b 24 November 2021 GY/TW)
Plan EDP 14	Bat Activity Survey – August 2021 (edp2425_d034b 24 November 2021 GY/TW)

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	Report Ref: edp2425_r007			
	Author	**Formatted**	**Peer Review**	**Proofed by/Date**
007_DRAFT	JM	FM	TW	-
007a	JM	SC	-	-
007b	JM	-	-	CR 091121
007c	JM	-	-	JMo 241121

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Executive Summary

S1 The Environmental Dimension Partnership Ltd (EDP) was commissioned by Tritax Symmetry Ltd and Siemens Healthineers to undertake a range of baseline ecological investigations in order to inform a planning application for commercial development on land at Symmetry Park, Oxford North (hereafter referred to as 'the Site').

S2 The baseline ecological investigations undertaken across the Site as part of the appraisal included a desk study, Extended Phase 1 survey and detailed (Phase 2) surveys relating to breeding birds, roosting and foraging/commuting bats, otter (*Lutra lutra*), water vole (*Arvicola amphibius*), badger (*Meles meles*), reptiles, great crested newts (*Triturus cristatus*), and hairstreak butterflies. All surveys were undertaken with reference to best practice guidance.

S3 There are no internationally designated sites within 10km of the Site, although Oxford Meadows Special Area of Conservation (SAC) lies approximately 12km south-west of the Site.

S4 There are seven statutory designated sites within 5km of the Site, Wendlebury Meads and Mansmoor Closes Site of Special Scientific Interest (SSSI), Weston Fen SSSI, Ardley Trackways SSSI, Ardley Cutting and Quarry SSSI, Otmoor SSSI, Arncott Bridge Meadows SSSI, and Bure Park Local Nature Reserve, although given the distances involved, it is not considered there would be any negative impacts on these SSSIs as a result of the Proposed Development.

S5 There are three non-statutory designated Local Wildlife Sites (LWS) within 2km of the Site: Bicester Wetland Reserve Local Wildlife Site (LWS), Wormough Copse LWS, Weston Wood LWS, and Bowlers Copse Cherwell District Wildlife Site (CDWS). Of these, only Bowlers Copse CDWS is considered, in the absence of appropriate mitigation, to be at risk of adverse effects as a result of the proposed development.

S6 The majority of the Site comprises improved grassland fields, with smaller areas of bare ground, tall ruderal vegetation, buildings and hardstanding that are of negligible intrinsic ecological importance. However, the Site also includes a semi-improved grassland field, a pond, broad-leaved semi-natural woodland (part of which comprises ancient semi-natural woodland), hedgerows and trees, and a wet ditch that are of Local ecological importance.

S7 In terms of protected and Priority Species, surveys have confirmed the presence of populations of wintering birds, breeding birds, foraging/commuting bats, otter, common toad (*Bufo bufo*), reptiles, brown hairstreak (*Thecla betulae*) and black hairstreak (*Satyrium pruni*) within the Site.

S8 The Important Ecological Features (IEFs) identified within the Site that are pertinent to an Ecological Impact Assessment (EcIA) in respect of the proposed development are listed in **Table EDP S1**.

Table EDP S1: Important Ecological Features to be assessed within the EclA.

Important Ecological Feature	Key Attributes	Level of Ecological Importance
Designated Sites		
Bowlers Copse CDWS	Semi-natural community woodland that is coppiced.	District
Habitats		
Broad-leaved semi-natural woodland	Area of semi-natural woodland surrounding a pond, the southern part of which comprises Ancient Semi-natural Woodland (ASNW) (directly adjacent to the Site).	Local–County
Species-poor hedgerow and trees	Following the wet ditch across the southern portion of the Site. Low distinctiveness although forms part of notable habitat corridor.	Local
Semi-improved grassland	A field of semi-improved grassland in the south of the Site, south of the wet ditch.	Local
Wet ditches	Wet ditches run along the western boundary of the Site and through the southern part of the Site. Only very low water levels.	Local
Species		
Birds	No significant breeding or wintering populations on-site, although the hedgerows, trees and woodland offer suitable nesting habitat. Barn owl (*Tyto alba*) recorded foraging, but no breeding confirmed.	Local
Bats	Potential roosting in several mature trees and confirmed roost in two trees. Foraging and commuting by mostly common and widespread bat species with low numbers of uncommon species including barbastelle (*Barbastella barbastellus*). A number of trees with bat roost potential were identified, two of which were recorded as having bats emerge from them, which were subject to aerial roost inspection surveys.	Local
Otter	Limited evidence of presence suggests occasional dispersal along the wet ditch within the Site.	Site
Badger	No evidence recorded within the Site, but setts and other evidence recorded in wider area such that future presence in the Site cannot be ruled out.	Site
Common Toad	Small population recorded using terrestrial habitats within the Site.	Site
Reptiles	Low population of grass snake (*Natrix helvetica*) within tall ruderal vegetation and western boundary margins	Site

Important Ecological Feature	Key Attributes	Level of Ecological Importance
Butterflies	Non-significant breeding population of brown hairstreak and black hairstreak butterflies on-site.	Local

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Section 1
Introduction, Purpose and Context

1.1 This Ecological Baseline report has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of Tritax Symmetry Ltd and Siemens Healthineers (hereafter referred to as 'the Client'). This report describes the baseline ecological conditions relevant to land at Symmetry Park, Oxford North (hereafter referred to as 'the Site').

1.2 EDP is an independent environmental planning consultancy with offices in Cirencester, Cheltenham and Cardiff. The practice provides advice to private and public-sector clients throughout the UK in the fields of landscape, ecology, archaeology, cultural heritage, arboriculture, rights of way and masterplanning. Details of the practice can be obtained at our website (www.edp-uk.co.uk).

Site Context

1.3 The Site is centred approximately at Ordnance Survey Grid Reference (OSGR) SP 5551 1979. The Local Planning Authority is Cherwell District Council (CDC). The Site measures 19.22 hectares (ha) and is located to the east of the M40 and north of the A41.

1.4 The principal ecological features within the Site (identified through site survey) are illustrated on **Plan EDP 1**, with habitat descriptions and illustrative site photographs provided in **Annex EDP 1**. The Site predominantly comprises improved grassland fields along with one semi-improved grassland field, with smaller areas of bare ground, tall ruderal vegetation, wet ditches, semi-natural woodland and hedgerows. Areas of hardstanding and buildings are present in the north of the Site.

Scope of Ecological Baseline

1.5 This Ecological Baseline report describes the current ecological interest within and around the Site, which has been identified through standard desk- and field-based investigations. This information forms the basis of an Ecological Impact Assessment (EcIA) of proposed commercial development within the Site, as set out within Chapter 8 (Biodiversity) of the Environmental Statement accompanying the planning application.

1.6 The remainder of this report is structured as follows:

- **Section 2** summarises the methodology employed in determining the baseline ecological conditions within and around the Site (with further details provided within annexes and on plans where appropriate);

- **Section 3** summarises the results of the baseline ecological surveys (with further details also provided within annexes and on plans where appropriate) and identifies and evaluates any pertinent ecological features/receptors; and

- **Section 4** summarises the results of the baseline report and provides the overall conclusions.

Section 2
Methodology (Baseline Investigations)

2.1 This section summarises the methodologies employed in determining the baseline ecological conditions within the Site. The baseline surveys have been undertaken by appropriately qualified ecologists using relevant best practice methodologies wherever possible. Reasons for any departure from best practice methodology are given and normally relate to the timing of EDP's commission and/or the availability of access to parts of the Site. Full details of the techniques and process adopted are, where appropriate, provided within annexes and on plans to the rear of this report.

Desk Study

2.2 The desk study is an important element of undertaking an ecological baseline assessment of a site proposed for development, enabling the initial collation and review of contextual information, such as designated sites, together with known records of protected and Priority Species.

2.3 An ecological desk study of the Site was undertaken in June 2021. The organisations contacted/resources accessed, and the type of information requested, are summarised within **Table EDP 2.1**.

Table EDP 2.1: Organisations Contacted for Ecological Records.

Organisation/Resource	Information Requested (Search Distance from Study Area Boundary)
Thames Valley Environmental Records Centre (TVERC)	• Non-statutory local sites (2km); and • Protected/notable species records (2km).
Multi-Agency Geographic Information for the Countryside (MAGIC) website[1]	• International statutory designations (15km); and • National statutory designations (5km).

2.4 The scope and search areas of the ecological desk study are considered sufficient to cover the potential zones of influence[2] of the proposed development in relation to designated sites, habitats and species.

2.5 Any pertinent information received as a result of the desk study has been specifically referenced within **Section 3**.

Extended Phase 1 Survey

2.6 The survey technique adopted for the initial habitat assessment was at a level intermediate between a standard Phase 1 survey technique[3], based on habitat mapping

[1] www.magic.defra.gov.uk
[2] Zone of Influence - the areas and resources that may be affected by the proposed development

and description, and a Phase 2 survey, based on detailed habitat and species surveys. The survey technique is commonly known as an Extended Phase 1 survey. This level of survey does not aim to compile a complete floral and faunal inventory for the Site.

2.7 The level of survey involves identifying and mapping the principal habitat types and identifying the dominant plant species present in each principal habitat type. In addition, any actual or potential protected species or species of principal importance are identified and scoped, in consideration with the findings of the above ecology scoping survey.

2.8 An Extended Phase 1 survey of the Site was originally undertaken by a suitably experienced surveyor on 12 April 2018, which was updated on 30 June 2021, during optimal months for botanical recording. The weather during the surveys was warm, dry and sunny with little to no wind. The surveys are, therefore, not considered to have been constrained by seasonal or climatic conditions. Further details of the Extended Phase 1 survey, habitat descriptions and site photographs are provided in full at **Annex EDP 1** and shown on **Plan EDP 1**.

Detailed (Phase 2) Surveys

2.9 The scope of Phase 2 surveys undertaken at the Site was defined following the initial studies described above (desk study and Extended Phase 1 survey). The surveys 'scoped in' are summarised in turn below and a brief explanation of those potential surveys 'scoped out' is provided thereafter.

Hedgerow Survey

2.10 Owing to the presence of a network of hedgerows within the Site, with variable quality and species-diversity, a detailed survey was undertaken to assess their value with reference to the Wildlife and Landscape criteria provided in Part II of Schedule 1 of the *Hedgerows Regulations* 1997. The survey was completed on 18 June 2018 and the findings checked on 22 February 2021. Further details are provided in **Annex EDP 2**, with hedgerow locations and references provided on **Plan EDP 1**.

Pilot Wintering Bird Survey

2.11 The value of the Site for wintering birds was assessed through the completion of a pilot wintering bird survey undertaken on 22 November 2018 to assess the value of the assemblage and to advise of the need for further surveys. The pilot survey was undertaken with reference to the Common Bird Census (CBC) approach. Further/updated surveys were not deemed necessary following this initial survey.

2.12 Full details of the pilot wintering bird survey are provided in **Annex EDP 3**.

[3] Joint Nature Conservation Council (2004) *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit* (reprinted with minor corrections for original Nature Conservancy Council publication).

Breeding Bird Surveys

2.13 The Site was surveyed on three occasions in 2018 (12 April, 16 May and 27 June 2018) for the presence of breeding birds, as well as a single update survey carried out on 06 April 2021. The surveys were undertaken with reference to the CBC approach.

2.14 Full details of the breeding bird surveys are provided in **Annex EDP 4**.

Bat Surveys

2.15 The Extended Phase 1 survey identified six farm buildings in the north of the Site, although none of these were recorded as having potential to support roosting bats. The habitats within the Site have potential to support a foraging and commuting assemblage of bats, while trees within the hedgerows were assessed for their potential to support roosting bats. The following surveys for bats were therefore undertaken during the active bat season in 2018 and updated in 2021 with reference to national best practice guidelines[4]: daytime inspections of trees for their bat roosting potential; manual transect surveys; and automated detector surveys.

2.16 Full details of the bat surveys are provided in **Annex EDP 5**.

Bat Roosting - Trees

2.17 All trees within the Site were visually assessed from ground level for the presence of bats/evidence of bats and potential to support roosting bats by a suitably experienced ecologist on 12 April 2018, with updated surveys carried out on 22 February 2021. This included searching for the presence of potential bat roosting features such as: loss/peeling/fissured bark; natural holes e.g. rot holes and holes from fallen limbs; woodpecker holes; cracks/splits or hollow tree trunks/limbs; and thick-stemmed ivy. On the basis of this evidence, trees were assigned a rating of low, medium or high potential.

Aerial Tree Inspection for Bats

2.18 Two trees within the Site were recorded as supporting roosting bats during the transect surveys. In line with good practice guidelines[5], an aerial inspection of these trees was undertaken on 07 October 2021. This aerial inspection was undertaken to assess the suitability of each tree to support roosting bats and to search for evidence of bat use.

2.19 The aerial inspection looked at each Potential Roosting Feature (PRF) with a view to: i) identify which, if any, features are suitable for supporting roosting bats; ii) make recommendations for further surveys to confirm presence or likely absence of bats in accordance with good practice guidelines; and iii) if bats, or evidence of bats, are present, to make an assessment of the roost type and status to inform the proposed redevelopment (and any future Natural England licence application, if applicable).

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

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

2.20 The aerial inspection was undertaken by a suitably experienced and qualified Natural England bat licensed ecologist and assistant, using a ladder in order to assess the PRFs, along with an endoscope (RIDGID CA 300), torches and mirrors, where necessary, to inspect PRFs.

2.21 Details of each PRF were recorded according to the Bat Tree Habitat Key (BTHK) standard[6], and any evidence or field signs of bats were noted.

Bat Foraging/Commuting

2.22 Features such as trees, hedgerows, scrub and rough grassland within the Site were identified as being potentially suitable for foraging and commuting bats. Therefore, bat activity was investigated through a combination of manual transect surveys and automated detector surveys undertaken in April, June and August 2018, with updated surveys carried out in May, July and August 2021.

Otter and Water Vole Surveys

2.23 The wet ditch that runs through the southern half of the Site, along with a wet ditch north of this, are considered to offer potentially suitable habitat for otter (*Lutra lutra*) and water vole (*Arvicola amphibius*). As such, surveys of these wet ditches were carried out on 14 June and 13 August 2018, with updated surveys carried out on 28 May and 08 July 2021 to determine the presence/likely absence of these species.

2.24 Full details of the otter and water vole survey are provided in **Annex EDP 6**.

Badger Walkover Survey

2.25 The Site offers suitable foraging or sett building opportunities for badgers (*Meles meles*) within the hedgerows, woodland and tall ruderal bunds, and as such, the Site was subject to walkover surveys on 12 April 2018, 22 February and 30 June 2021.

2.26 Full details of the badger walkover survey are provided in **Annex EDP 7**.

Great Crested Newt Surveys

2.27 There are no ponds present within the Site itself, although four lie within 500m of the Site boundary (illustrated as P1 to P4 on **Plan EDP 2**). Ponds P1–P4 all held water during the surveys and were therefore considered to have potential to support great crested newt (*Triturus cristatus*).

2.28 Traditional presence/absence surveys were commenced on ponds P1–P4 in April 2018 following best practice guidance methods[7]. In parallel, water sampling for environmental DNA (eDNA) was undertaken of Ponds P1–P4 on 24 April 2018. Once the results of the

[6] *Bat Roosts in Trees: A Guide to Identification and Assessment for Tree-Care and Ecology Professionals*. Henry Andrews 2018
[7] English Nature (2001). Great Crested Newt Mitigation Guidelines. English Nature, Peterborough

eDNA surveys of these ponds were returned as negative, the presence/absence surveys of these ponds were ceased. Updated eDNA surveys were also undertaken on these ponds on 12 May 2021.

2.29 Full details of the great crested newt surveys are provided in **Annex EDP 8**.

Reptile Surveys

2.30 During the Extended Phase 1 survey, the hedgerow margins and tall ruderal vegetation were considered suitable to support common and widespread reptile species. Therefore, artificial refugia were deployed throughout the Site and checked for reptiles on seven occasions during between May and September 2018, with updated surveys carried out between May and August 2021.

2.31 Full details of the reptile surveys are provided in **Annex EDP 9**.

Brown, Black and White-letter Hairstreak (Butterfly) Surveys

2.32 Nine records of brown hairstreak (*Thecla betulae*) and one record of black hairstreak (*Satyrium pruni*) were returned by TVERC as part of the desk study, these being from around 1.5km south of the Site, and the Site was considered to contain suitable habitat for these species. In addition, the Site was considered to contain suitable habitat for white-letter hairstreak (*Satyrium w-album*). All three species are Priority Species which have a stronghold in Oxfordshire. Surveys for these species, comprising winter egg searches, were therefore conducted on 22 November 2018, with an updated survey carried out on 22 February 2021.

2.33 Full details of the butterfly surveys are provided in **Annex EDP 10**.

Surveys Scoped Out

2.34 **Table EDP 2.2** summarises other survey types, which, while commonly required as part of an EcIA of development sites, were not considered necessary/appropriate in this case.

Table EDP 2.2: Ecology Surveys Scoped Out

Survey Type	Reasons for Scoping Out
Botanical surveys	Extended Phase 1 Habitat survey information was sufficient to confirm habitat value, with no indication of particularly high value habitats present.
Full wintering bird surveys	Limited extent and/or quality of on-site habitats for wintering birds, and the pilot wintering bird survey did not record any flocks of birds or notable species.

Survey Type	Reasons for Scoping Out
Dormouse survey	Woodland habitats present along the western boundary of the Site are considered sub-optimal given their structure and species composition, with a lack of scrubby understorey and linkages to optimal habitat in the wider landscape (and the presence of the M40 adjacent to these habitats). Impacts on this habitat are considered likely to be very minor. No records of dormice were returned from within 2km of the Site.
Additional invertebrates	Vast majority of the natural habitats within the Site are of low quality, maturity or distinctiveness. Adjacent suitable habitats to be retained.

Section 3
Results (Baseline Conditions)

3.1 This section summarises the baseline ecological conditions determined through the course of the desk- and field-based investigations described in **Section 2**. In particular, it identifies and evaluates those IEFs that lie within the Site's potential zone of influence, and which are pertinent in the context of the proposed development.

3.2 The evaluation of potential IEFs has been undertaken in accordance with the latest Chartered Institute of Ecology and Environmental Management (CIEEM) guidance[8] with professional judgement and available guidance used to assign a value to IEFs at a geographical scale. Further technical details are, where appropriate, provided within annexes and on plans to the rear of this report.

Designated Sites

3.3 Information regarding designated sites was obtained during the desk study from the MAGIC website and TVERC. Statutory designations (those receiving legal protection) and non-statutory designations (those receiving planning policy protection only) are discussed in turn below.

Statutory Designations

3.4 Statutory designations represent the most significant ecological receptors, being of recognised importance at an international and/or national level. International designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites. National designations include Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs).

3.5 The Site is not within or adjacent to any international/national statutory designations. However, the Site lies within the Impact Risk Zone (IRZ) of two SSSIs, as discussed below.

3.6 The Wendlebury Meads and Mansmoor Closes SSSI is located around 1.4km south of the Site and is separated from the Site by the M40. This SSSI is notified for its unimproved neutral meadows that support a variety of flora, as well as species-rich hedgerows. This SSSI supports breeding snipe (*Gallinago gallinago*) and curlew (*Numenius arquata*), as well as other breeding birds.

3.7 Weston Fen SSSI lies around 2.5km west of the Site and is notified as a species-rich calcareous fen that supports wetland plant communities and a variety of invertebrates, including two species listed in the British Red Data Book of rare and threatened species, *Sphaerius acaroides* and *Eubria palustris*.

[8] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.1. Chartered Institute of Ecology and Environmental Management, Winchester.

3.8 The IRZ that covers the majority of the Site states that there could be adverse impacts on statutory designated sites from:

- Any transport proposal including road, rail and by water (excluding routine maintenance);
- Large non-residential developments outside existing settlements/urban areas where footprint exceeds 1ha;
- Any discharge of water or liquid waste of more than 5m^3/day to ground (i.e. to seep away) or to surface water, such as a beck or stream; and
- Large infrastructure such as warehousing/industry where total net additional gross internal floorspace following development is 1,000m^2 or more.

3.9 Owing to the nature of the proposed development, the separation distances between the Site and these SSSIs and the absence of any impact pathways, it is not considered that any significant adverse effects on these SSSIs would arise from the proposed development. Accordingly, these have been scoped out of the EcIA as IEFs.

Non-statutory Designations

3.10 Non-statutory designations are also commonly referred to in planning policies as 'local sites', although in fact these designations are typically considered to be important at a County-level. In Oxfordshire, such designations are named Local Wildlife Sites (LWS). Additional designated sites, which should be considered at this level, include Local Nature Reserves (LNR), Cherwell District Wildlife Sites (CDWS), the selection criteria for which are based on LWS criteria although with lower thresholds and requirements, proposed Cherwell District Wildlife Sites (pCDWS), and Ancient Semi-natural Woodland (ASNW) where these are not covered by other designations.

3.11 No part of the Site is covered by any LWS, although there is an area of ASNW within the Site as described in the Habitats section below. In addition, there are three LWS, one CDWS, and three pCDWS within the Site's potential zone of influence, as summarised within **Table EDP 3.1**.

Table EDP 3.1: Statutory Designations Within the Site's Potential Zone of Influence.

Name and Designation	Distance from Site	Interest Feature(s)
Bowlers Copse CDWS	c.50m south	Semi-natural community woodland that is coppiced.
Fox Covert (south) pCDWS	c.450m south-west	Semi-natural lowland mixed deciduous woodland.
Wormough Copse LWS	1km south	Small fragment of an ancient woodland coppice that supports badgers, black hairstreak and nesting birds.
Wendlebury Ponds pCDWS	1.3km south-east	Three ponds surrounded by wet woodland and lowland fen that support dragonflies.

Name and Designation	Distance from Site	Interest Feature(s)
Weston Wood LWS	1.6km south-west	An area of ancient woodland that supports breeding birds and black hairstreak.
Promised Land Farm Meadows pCDWS	1.7km north-east	Remnant lowland meadow with a pond.
Bicester Wetland Reserve LWS	1.8km north-east	wet grassland, open water, reedbeds and coastal floodplain grazing marsh that support overwintering wildfowl and other notable birds.

3.12 With the exception of Bowlers Copse CDWS (which is of District-level ecological importance), the remainder of the non-statutory designations have been scoped out of the EcIA as IEFs. In the absence of appropriate mitigation, this CDWS is considered to be at risk of potential degradation as a result of development within the Site, given that it is directly hydrologically connected to the Site. As a result, this IEF will be considered further in the EcIA. The locations of the nearby LWS, CDWS and pCDWS are shown on **Plan EDP 3**.

Habitats

3.13 Information on habitats within and around the Site was obtained during the desk study, and the Extended Phase 1 survey.

3.14 The desk study returned a number of records of plants within 2km of the Site. Of these records, the nearest records returned were for bluebell (*Hyacinthoides non-scripta*). a Wildlife and Countryside Act 1981 (as amended) Schedule 8 species protected from sale only, and sanicle (*Sanicula europaea*), a Red List near-threatened species, both recorded around 0.7km north-east in 2019. Neither of these species were recorded within the Site.

3.15 The distribution of different habitat types within and adjacent to the Site is illustrated on **Plan EDP 1**. In addition, detailed descriptions of these habitat types, together with illustrative photographs, are provided in **Annex EDP 1**. A summary, and qualitative assessment of these habitats is provided in **Table EDP 3.2**.

Table EDP 3.2: Summary of Habitats Within the Site.

Habitat or Feature	Distribution within Site	Level of Intrinsic Ecological Importance
Improved grassland	Covers the majority of the Site.	**Site only**, owing to low distinctiveness and intensity of management.
Semi-improved grassland	A single large field in the south of the Site.	**Local**, owing to the diversity of floral species present.
Species-rich hedgerows	Two sections on the north eastern edge of the Study Area (off-site).	**Local**, although low distinctiveness and defunct nature of the hedgerow.
Species-poor hedgerow with trees	Following the wet ditch across the southern portion of the Site.	**Local**, low distinctiveness although forms part of notable habitat corridor.

Habitat or Feature	Distribution within Site	Level of Intrinsic Ecological Importance
Species-poor hedgerows	Separating the fields throughout the Site.	**Site**, owing to lack of species diversity and intensive management.
Broad-leaved semi-natural woodland with ASNW	Area of semi-natural woodland in the surrounding a pond, the southern part of which comprises ASNW (directly adjacent to the Site).	**Local** to **County** as the woodland contains some non-native species.
Tall ruderal vegetation	One large and one small soil bund associated with the farm have been colonised with tall ruderal vegetation.	**Negligible**, owing to low distinctiveness and regularly disturbed nature of the soil bunds.
Pond	One pond in the west of the Study Area surrounded by woodland (off-site).	**Site** owing to low distinctiveness and does not support protected species.
Wet ditches	A wet ditch runs through the southern part of the Site, and wet ditches run along some internal hedgerows.	**Local** owing to connected nature of the wet ditches, although the water levels are low and the wet ditches dry annually.
Scattered trees	Scattered broadleaved and coniferous trees present at the margins of the Site and associated with boundary features.	**Site**, owing to connectivity with offsite habitats, although the coniferous trees are of negligible distinctiveness.
Bare ground	Two areas of bare ground associated with the farm and areas of tall ruderal vegetation.	**Negligible**.
Hardstanding	Areas of hardstanding associated with the farm and with a maintenance access track.	**Negligible**.
Buildings	Six warehouses associated with the farm.	**Negligible**, offering no roosting potential for bats.

3.16 As noted within **Table EDP 3.2**, the majority of habitats within the Site are of Site-level or Negligible ecological importance. However, the semi-improved grassland, broad-leaved woodland and wet ditch are considered to be of Local-level importance and are therefore taken forwards as an IEF in the EcIA. Furthermore, a number of the habitats or other features, which are of negligible intrinsic ecological importance may require consideration in relation to their importance in maintaining populations of protected and/or notable species. This is discussed further below.

Protected and/or Notable Species

3.17 The likelihood of presence, or confirmed presence, of protected/and or notable wildlife species within the Site is summarised below with reference to desk study records, habitat

suitability and detailed surveys where relevant. Further details are made available within annexes and plans where referenced.

3.18 Where a particular species or taxonomic group has been confirmed to be present, or presence is inferred based on habitat suitability, the ecological importance or significance of the population or assemblage is assessed on a geographical scale.

Birds

3.19 A large number of records for birds were returned from the desk study. Of these, 20 are considered to be pertinent to the habitats within the Site. These are barn owl (*Tyto alba*), bullfinch (*Pyrrhula pyrrhula*), fieldfare (*Turdus pilaris*), herring gull (*Larus argentatus*), house sparrow (*Passer domesticus*), lesser redpoll, (*Acanthis cabaret*), lesser spotted woodpecker (*Dryobates minor*), linnet (*Linaria cannabina*), mistle thrush (*Turdus viscivorus*), red kite (*Milvus milvus*), redwing (*Turdus iliacus*), reed bunting (*Emberiza schoeniclus*), skylark (*Alauda arvensis*), song thrush (*Turdus philomelos*), starling (*Sturnus vulgaris*), stock dove (*Columba oenas*), and yellowhammer (*Emberiza citrinella*). Of these, the nearest record was for red kite, recorded from the grid square containing the northern tip of the Site in 2015.

Pilot Wintering Bird Survey

3.20 A pilot wintering bird survey was undertaken on 22 November 2018, which recorded only a small number of species within the Site and no significant flocks of species. A total of six species were recorded within the Site. The species recorded within the Site included the following species that are on the Red List of Birds of Conservation Concern[9] (BoCC): starling (also a Priority Species), yellowhammer (also a Priority Species), redwing (also a WCA Schedule 1 species), and stock dove. The Priority Species bullfinch and dunnock (*Prunella modularis*) were also recorded within the Site. The results of this pilot wintering bird surveys can be seen on **Plan EDP 4**, with full results included at **Annex EDP 3.**

3.21 Based on the survey findings, the winter bird assemblage supported by the Site is judged to be of no greater than Local-level ecological importance.

Breeding Bird Surveys

3.22 Three breeding bird surveys were undertaken within the Site in 2018, with an additional breeding bird survey carried out in 2021. These surveys recorded an assemblage of birds typical of the agricultural and urban fringe environment present within the Site.

3.23 During the breeding bird survey carried out on 12 April 2018, 17 species were recorded within the Site, none of which were recorded breeding. Seven species were recorded probably breeding (holding territory), these being robin (*Erithacus rubecula*), song thrush, wren (*Troglodytes troglodytes*), dunnock, skylark, blackcap (*Sylvia atricapilla*) and

[9] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. and Gregory, R.D. (2015). *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds, Vol. 108, 708-746.

blackbird (*Turdus merula*). A further ten species were recorded as possibly breeding, being present in the correct habitat for breeding. All species were recorded in low numbers, with stock dove being the most numerous species recorded.

3.24 The breeding bird survey carried out on 16 May 2021 recorded ten species within the Site, of which five were possibly breeding. These being goldfinch (*Carduelis carduelis*), dunnock, blackcap, linnet, song thrush and whitethroat (*Sylvia communis*). In addition, the remaining four species were possibly breeding within the Site. All of these species were recorded in low numbers, with goldfinch being the most numerous species recorded in a small flock.

3.25 The breeding bird survey carried out on 27 June 2018 recorded 13 species within the Site, of which jackdaw (*Corvus monedula*) were recorded as breeding. An additional nine species were recorded as probably breeding, these being blackcap, blue tit (*Cyanistes caeruleus*), buzzard, collared dove (*Streptopelia decaocto*), dunnock, goldfinch, great tit (*Parus major*), song thrush and wren. In addition, three species were recorded as possibly breeding. The majority of species recorded within the Site were recorded in low numbers.

3.26 The updated breeding bird surveys carried out on 06 April 2021 recorded a total of 26 species within the Site, of which 11 were recorded as probably breeding, these being blackbird, blackcap, blue tit, dunnock, goldfinch, greenfinch (*Chloris chloris*), lesser whitethroat (*Sylvia curruca*), robin, skylark, song thrush and wren. A further eight were recorded as possibly breeding.

3.27 Of the species considered to be of conservation concern, four species were considered to be possibly breeding within the Site: skylark, linnet, song thrush, and dunnock.

3.28 Whilst not recorded during the breeding bird surveys, two sightings of barn owl were made during the bat transect surveys in May 2021 and in July 2021 (see **Plan EDP 2**). Based on the survey evidence, it is considered that barn owl hunts/forages within the Site but breeding has not been confirmed. This species is considered to be of no greater than Local-level ecological importance.

3.29 Full results of the breeding bird surveys are provided in **Annex EDP 4** and illustrated on **Plans EDP 5** to **8**.

3.30 Based on the survey findings, the breeding bird assemblage supported by the Site is judged to be of no greater than Local-level ecological importance.

Bats

3.31 A number of records for bat species were returned from TVERC for the following species: common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*), brown long-eared (*Plecotus auritus*), noctule (*Nyctalus noctula*), Leisler's (*Nyctalus leisleri*), Natterer's (*Myotis nattereri*), whiskered (*Myotis mystacinus*), Daubenton's (*Myotis daubentonii*), serotine (*Eptesicus serotinus*),

and the Annex II[10] species barbastelle (*Barbastella barbastellus*). The nearest records to the Site were for roosts of common pipistrelle and brown long-eared bats, recorded around 1.2km north in 2013.

Bat Roost Assessment Trees

3.32 The daytime assessment of trees within the Site identified 29 trees that have the potential to support roosting bats, including seven trees with high potential, 13 trees with moderate potential and nine trees with low potential. No bats or evidence of bats were found during the ground level tree assessment, although individual presumed noctule bats were observed emerging from trees T18 and T30 during the activity transect survey in May 2021.

3.33 An aerial tree survey did not record any evidence of roosting bats, and as such, the species present could not be confirmed. However, given the features present in both trees and the observations of the surveyors, the species assumption of noctule is considered to be correct. Given that bats were only recorded emerging from these two trees during one survey, it is considered these trees both represent summer day roosts of induvial noctule bats.

3.34 Full details of the bat roost assessment of trees within the Site are provided in **Annex EDP 5**.

Bat Roost Assessment - Buildings

3.35 Six buildings are present within the Site all of which were subject to an external inspection to identify their suitability to support roosting bats.

3.36 All of the on-site buildings are large warehouses used for agricultural purposes, which are open-sided. These buildings are subject to high levels of disturbance and are open to the elements, some of which also have skylights present in their roofs.

3.37 The surveys recorded all on-site buildings as having negligible potential to support roosting bats.

3.38 Full details of the bat roost assessment of buildings within the Site are provided in **Annex EDP 5**, and the location of the buildings is shown on **Plan EDP 1**.

Bat Foraging/Commuting Activity

3.39 In general, the transect surveys recorded low levels of bat foraging/commuting activity, and the levels of bat activity in 2018 and 2021 were generally the same, with the majority of activity recorded in June and July, and with the majority of registrations recorded from common pipistrelle, noctule and soprano pipistrelle.

[10] Species listed on Annex II of the Habitats Directive are those for which internationally protected SACs are selected to ensure they reach a favourable conservation status within the EU

3.40 The abundance and diversity of bat species recorded on-site is generally considered to be typical of an urban fringe setting, with common and widespread generalist common pipistrelle accounting for the majority of foraging and commuting activity. The adjacent woodland and tree belt habitats are considered, in the context of the surroundings, to provide some suitable foraging habitats for a more diverse assemblage, including Nathusius' pipistrelle, *Myotis* sp., serotine and long-eared (*Plecotus* sp.). Only an individual barbastelle, an Annex II species, was recorded during the transect surveys on one occasion, indicating that there is unlikely to be a roost nearby, and that this species is only using the Site for occasional foraging and commuting.

3.41 Overall, the majority of registrations recorded relate to common and widespread bat species, in particular; common pipistrelle and soprano pipistrelle. Most other species made up a very small proportion of the total registrations recorded, although there were slightly higher numbers of registrations of noctule, a widespread but less abundant species. Of note is the presence of the rarer barbastelle, an Annex II species. Generally, only very low levels of barbastelle activity were recorded in 2018 and 2021, with single digit numbers of registrations recorded on a small number of survey days. although a larger number of registrations was recorded at one location during April 2018.

3.42 Full details of the survey results are provided in **Annex EDP 5** and illustrated on **Plans EDP 9** to **14**.

3.43 Based on the survey findings, the bat population supported by the Site is considered to be of no greater than Local-level ecological importance.

Otter and Water Vole

3.44 No records of otter or water vole were returned by TVERC.

3.45 Surveys for otter and water vole were carried out in June and August 2018, with updated surveys carried out in May and July 2021. Evidence of dry and fragmented otter spraints were recorded during the survey in 2018, however, no evidence of otter was recorded during the 2021 surveys, and indeed the wet ditch was recorded as only holding 5–15cm water by the survey in July 2021.

3.46 It is considered likely that otters are only occasionally present within the wet ditch running through the Site and are therefore of Site-level ecological importance only. Nonetheless, otter will be included as an IEF by virtue of its legal protection.

3.47 No evidence of water vole was recorded during the surveys in 2018 or 2021. Water vole are therefore considered absent from the sections of wet ditches within the Site.

3.48 Full details of the survey results are provided in **Annex EDP 6** and illustrated on **Plan EDP 2**.

Badgers

3.49 The desk study returned nine records of badger, the majority of which were for setts and latrines. The nearest record was around 0.7km north of the Site, dated from 2018.

3.50 During the survey, no evidence of badger setts was recorded within the Site, although evidence of badger activity was recorded within the wider area. It is considered that the hedgerows, woodland and tall ruderal vegetation within the Site offer suitable shelter and foraging opportunities for this species, while the improved and semi-improved grassland also offers suitable foraging opportunities. This species will, therefore, be included as an IEF by virtue of its potential presence and its legal protection. However, given that it is protected for welfare reasons rather than conservation status, badgers are considered to be of no more than Site-level importance.

3.51 Full details of the survey results are provided in **Annex EDP 7**.

Other Mammals

3.52 The desk study returned a small number of records for brown hare (*Lepus europaeus*) and polecat (*Mustela putorius*), both of which are Priority Species. Although it is considered the hedgerows, woodland and grassland habitats within the Site offer some suitable opportunities for these species, neither of these species were recorded within the Site during other surveys undertaken, and it is not considered either of these species would be reliant on the Site, given there are extensive opportunities for these species in the wider landscape, and will therefore not be taken forwards to EcIA.

Great Crested Newt

3.53 The desk study returned 41 records of great crested newt, the nearest of which was recorded around 0.7km north of the Site in 2014.

3.54 An HSI assessment completed on all of the accessible water bodies within 500m of the Site identified pond P1 as having below average suitability, P2 as having poor suitability and ponds P3 and P4 as having average suitability.

3.55 The first three traditional bottle trapping surveys of ponds P1–P4 carried out in April 2018 recorded no evidence of great crested newts. Subsequent eDNA surveys of ponds P1–P4 in 2018 all returned negative results. Updated eDNA surveys carried out on ponds P1–P4 were carried out on 12 May 2021, which again returned negative results for all ponds.

3.56 Given the negative results returned from the great crested newt eDNA surveys, no further surveys were considered necessary and great crested newt are considered to be absent from the Site and the immediate surroundings.

3.57 With regards to other amphibians, a small population of common toad (*Bufo bufo*), a Priority Species, was recorded within the Site during the reptile surveys, generally

associated with the areas of tall ruderal vegetation. This population is considered to be of no greater than Site-level ecological importance, however, as a Priority Species, common toad receives indirect legal protection (through Section 41 of the NERC Act 2016) and will be included as an IEF.

3.58 Full details of the survey results are provided in **Appendix EDP 8**, and pond locations shown on **Plan EDP 2**.

Reptiles

3.59 The TVERC returned a single record of a grass snake (*Natrix helvetica*) from within the 2km search area, from around 0.4km south-west of the Site, separated from the Site by the M40, in 2010.

3.60 The woodland, hedgerow, grassland, tall ruderal vegetation and pond habitats all provide suitable terrestrial habitat to support reptiles and as such, surveys were completed between May and September 2018. Updated surveys were also undertaken between May and August 2021.

3.61 The reptile surveys in 2018 recorded no evidence of any reptiles within the Site. However, the surveys in 2021 recorded a small population of grass snake (maximum count one adult and one juvenile on any one occasion) within the Site, within the tall ruderal vegetation and the western hedgerow associated with the M40 corridor. Full details of the reptile surveys are given in **Appendix EDP 9** and detailed on **Plan EDP 2**.

3.62 Based on the survey findings, the reptile population is considered to be of Site-level ecological importance. Nonetheless, reptiles will be included as an IEF by virtue of their legal protection.

Butterflies

3.63 The TVERC returned records of four butterfly species from within the 2km search area. These are the Priority Species small heath (*Coenonympha pamphilus*), grayling (*Hipparchia semele*), brown hairstreak and black hairstreak. These records were all returned from the south of the Site, with the closest being for a brown hairstreak recorded around 1.5km south in 2016.

3.64 Of these species, it is considered that the habitats within the Site have the potential to support both brown and black hairstreak.

Hairstreak Egg Search

3.65 During the survey carried out in December 2018, brown hairstreak eggs were recorded within the Site, within hedgerows H10 and the tree belt south of H9 within the Site (see **Plan EDP 2**), confirming the presence of a breeding population of the species. No eggs of black hairstreak or white-letter hairstreak were recorded during this survey.

3.66 During the updated survey carried out in February 2021, brown hairstreak eggs were recorded within hedgerow H7 within the Site, and black hairstreak (a Red Data Book species) eggs were recorded within hedgerow H6 within the Site (see **Plan EDP 2**), confirming breeding populations of both of these species. No eggs of white-letter hairstreak were recorded during this survey.

3.67 It is considered that the ability of the Site to support significant numbers of brown hairstreak adults is limited by the current agricultural management of the hedgerow network which includes heavy flailing on all sides on at least an annual basis, thereby, periodically destroying the vast majority of the egg-laying habitat and eggs themselves.

3.68 Nevertheless, owing to the scarcity of the species, it is considered that the population present is of Local-level ecological value.

3.69 White-letter hairstreak are associated with elm (*Ulmus* sp.) which is present throughout the Site in low quantities. The hedgerows in which the elm are found are subject to regular flailing as discussed previously, which reduces their suitability. In addition, no eggs of this species were recorded. It is, therefore, not considered that the Site supports a significant, viable population of white-letter hairstreak.

3.70 Full details of the butterfly surveys are given in **Appendix EDP 10** and detailed on **Plan EDP 2**.

Other Invertebrates

3.71 The TVERC returned five records of nationally scarce beetles from within 2km of the Site. Although there were no specific details of their locations, four of these species *Ceutorhynchus atomus*, *Rhinocyllus conicus*, *Larinus planus*, and *Polydrusus flavipes* were returned from three 1km grid squares to the east of the Site in 2015, while one additional species *Podagrica fuscicornis* was recorded from two 2km grid squares to the east in 2011. It is considered the hedgerow, woodland, tall ruderal vegetation and grassland within the Site offer some suitable habitat for these species, although it is not considered any of these species would be reliant on the habitats present within the Site.

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Section 4
Summary of Findings

4.1 Based on the investigations described above, the IEFs pertinent to the EcIA (i.e. those of Local-level ecological importance or greater, or those receiving legal protection) of the proposed development, are listed in **Table EDP 4.1**.

Table EDP 4.1: Important Ecological Features to be assessed within the EcIA.

Important Ecological Feature	Key Attributes	Level of Ecological Importance
Designated Sites		
Bowlers Copse CDWS	Semi-natural community woodland that is coppiced.	District
Habitats		
Broad-leaved Semi-natural woodland	Area of semi-natural woodland in the surrounding a pond, the southern part of which comprises ASNW (directly adjacent to the Site).	Local-County
Species-poor hedgerow and trees	Following the wet ditch across the southern portion of the Site. Low distinctiveness although forms part of notable habitat corridor.	Local
Semi-improved grassland	A field of semi-improved grassland in the south of the Site, south of the wet ditch.	Local
Wet ditches	Wet ditches run along the western boundary of the Site and through the southern part of the Site. Only very low water levels.	Local
Species		
Birds	No significant breeding or wintering populations on-site, although the hedgerows, trees and woodland offer suitable nesting habitat. Barn owl recorded foraging but no breeding confirmed.	Local
Bats	Potential roosting in several mature trees and confirmed roost in one tree. Foraging and commuting by mostly common and widespread bat species with low numbers of uncommon species including barbastelle.	Local
Otter	Limited evidence of presence suggests occasional dispersal along the wet ditch within the Site.	Site
Badger	No evidence recorded within the Site, but setts and other evidence recorded in wider area such that future presence in the Site cannot be ruled out.	Site

Important Ecological Feature	Key Attributes	Level of Ecological Importance
Common Toad	Small population recorded using terrestrial habitats within the Site.	Site
Reptiles	Low population of grass snake within tall ruderal vegetation and western boundary margins	Site
Butterflies	Non-significant breeding population of brown hairstreak and black hairstreak butterflies on-site.	Local

Annex EDP 1
Habitat Descriptions and Site Photographs

A1.1 The Site comprises predominantly improved and semi-improved grassland fields separated and bordered by hedgerows and tree belts, with small areas of semi-natural woodland (including an area of ASNW), tall ruderal vegetation, bare ground, a pond, and wet ditches, buildings and hardstanding. The habitats within the Site are described further below, with illustrative photographs provided where appropriate. The following should be read in conjunction with **Plan EDP 1**.

Improved Grassland

A1.2 The majority of the Site comprises improved grassland fields (F1–F9) that are grazed regularly by sheep, and appear to have been sown on former arable fields (see **Image EDP A1.1**).

A1.3 These fields are generally dominated by perennial rye-grass (*Lolium perenne*), with other species in the sward including frequently found red fescue (*Festuca rubra*), occasionally found Yorkshire fog (*Holcus lanatus*), timothy (*Phleum pratense*), blackgrass (*Alopecurus myosuroides*) and meadow barley (*Hordeum secalinum*), and rarely found soft brome (*Bromus hordaceus*), crested dog's tail (*Cynosurus cristatus*), cock's-foot (*Dactylis glomerata*), and hard rush (*Juncus inflexus*) that is found near the wet ditch margins. Herbaceous species found include frequently found white clover (*Trifolium repens*), occasionally found creeping buttercup (*Ranunculus repens*), and rarely found cut-leaved cranesbill (*Geranium dissectum*), common mouser-ear (*Cerastium fontanum*), field bindweed (*Convolvulus arvensis*), spear thistle (*Cirsium vulgare*), oxeye daisy (*Leucanthemum vulgare*), greater plantain (*Plantago major*), broad-leaved dock (*Rumex obtusifolius*), lesser burdock (*Arctium minus*), common ragwort (*Jacobaea vulgaris*), forget-me-not (*Myosotis* sp.), curled dock (*Rumex crispus*), and bristly oxtongue (*Helminthotheca echioides*).

A1.4 The small section of field F1 that lies within the Site also includes rarely found selfheal (*Prunella vulgaris*), common vetch (*Vicia sativa*), common fleabane (*Pulicaria dysenterica*) and black medic (*Medicago lupulina*).

A1.5 In addition, oak (*Quercus* sp.) saplings are present associated with the woodland and trees, and blackthorn (*Prunus spinosa*) is suckering into some of the field margins.

A1.6 Given the species-poor nature of these fields, which are dominated by grasses, the improved grassland fields are of low distinctiveness and judged to be of Site-level ecological importance only.

Image EDP A1.1: Improved grassland field F1.

Semi-improved Grassland

A1.7 There is one semi-improved grassland field that lies in the south of the Site (F10) (see **Image EDP A1.2**).

A1.8 Species present within the sward include abundant Yorkshire fog, frequently found hard rush, occasionally found tufted hair-grass (*Deschampsia caespitosa*), red fescue, spiked sedge (*Carex spicata*), false oat-grass (*Arrhenatherum elatius*), glaucous sedge (*Carex flacca*), cock's-foot, and rarely found hairy sedge (*Carex hirta*), soft brome, soft rush (*Juncus effusus*) and false fox sedge (*Carex otrubae*). Herbaceous species present include abundantly found creeping buttercup, and frequently found white clover, creeping cinquefoil (*Potentilla reptans*), common ragwort. Occasionally found species include bird's-foot trefoil (*Lotus corniculatus*), ground-ivy (*Glechoma hederacea*), bristly oxtongue, selfheal and oxeye daisy, and rarely found spear thistle, tufted vetch (*Vicia cracca*), meadow vetchling (*Lathyrus pratensis*), cut-leaved cranesbill (*Geranium dissectum*), forget-me-not, ragged robin (*Lychnis flos-cuculi*), meadowsweet (*Filipendula ulmaria*), Russian comfrey (*Symphytum × uplandicum*), broad-leaved dock (*Rumex obtusifolius*), common mouse-ear, cleavers (*Galium aparine*), ribwort plantain (*Plantago lanceolata*), marsh thistle (*Cirsium palustre*), broad-leaved willowherb (*Epilobium montanum*), teasel (*Dipsacus fullonum*), black medic, lesser stitchwort (*Stellaria graminea*), rough hawkbit (*Leontodon hispidus*), black knapweed (*Centaurea nigra*), stone parsley (*Sison amomum*), as well as bee orchid (*Ophrys apifera*) and common spotted orchid (*Dactylorhiza fuchsii*).

A1.9 In addition, there was scattered bramble (*Rubus fruticosus* agg.) scrub, ash (*Fraxinus excelsior*) saplings, hawthorn (*Crataegus monogyna*) saplings, and blackthorn suckering from the adjacent hedgerows.

A1.10 Given that there are ten wildflower indicator species for the Priority Habitat of Lowland Meadow (G06) present (bird's-foot trefoil, black knapweed, meadow vetchling, meadowsweet, common spotted orchid, bee orchid, oxeye daisy, ragged robin, rough hawkbit and glaucous sedge), it is considered that F10 comprises species-rich grassland of moderate quality and condition that could be restored to Lowland Meadow Priority Habitat, but does not currently meet the threshold for this Priority Habitat. This habitat is of moderate distinctiveness and judged to be of Local-level ecological importance.

Image EDP A1.2: Semi-improved grassland field F10.

Tall Ruderal Vegetation

A1.11 There are small areas of tall ruderal vegetation present within the Site, associated with soil bunds.

A1.12 Species present include black mullein (*Verbascum nigrum*), columbine (*Aquilegia vulgaris*), yellow toadflax (*Linaria vulgaris*), annual beard-grass (*Polypogon monspeliensis*), feverfew (*Tanacetum parthenium*), perforate St. John's-wort (*Hypericum perforatum*), black medic, forget-me-not, creeping buttercup, teasel, bristly oxtongue, red fescue, common nettle (*Urtica dioica*), foxglove (*Digitalis purpurea*), hedge woundwort (*Stachys sylvatica*), primrose (*Primula vulgaris*), Yorkshire fog, mugwort (*Artemisia*

vulgaris), broad-leaved dock, curled dock, spear thistle, common figwort (*Scrophularia auriculata*), cleavers, marjoram (*Origanum majorana*), bittersweet (*Solanum dulcamara*), white dead-nettle (*Lamium album*), bush vetch (*Vicia sepium*), hedge mustard (*Sisymbrium officinale*), goats rue (*Galega officinalis*), spearmint (*Mentha spicata*), white campion (*Silene latifolia*), and hemlock (*Conium maculatum*).

A1.13 Although annual beard-grass is an Oxfordshire notable species, this species is usually found near the coast, and given its presence on a soil bund, it is considered this species has most likely been introduced to the Site from imported soil. Given the ruderal and ephemeral, common and widespread species found in the tall ruderal vegetation, this habitat is considered to be of low distinctiveness and judged to be of Negligible ecological importance.

Hedgerows

A1.14 There are ten hedgerows or sections of hedgerows within the Site (H1, H3–H10 and H13), none of which are species-rich. The hedgerows are described individually below.

A1.15 H1 is around 4m high and 3m wide and box cut with some gaps at the base. Species present comprise elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*), willow sp. (*Salix* sp.), field maple (*Acer campestre*) whitebeam (*Sorbus aria*), and elm (*Ulmus* sp.), with common nettle, hogweed (*Heracleum sphondylium*) and false oat-grass in the ground flora.

A1.16 H3 is around 4m high and 3m wide and box cut with some gaps at the base. Species present comprise hawthorn, field maple and elder, with common nettle present in the ground flora.

A1.17 H4 is around 4m high and 3m wide and box cut with some gaps at the base. Species present comprise field maple, elm, hawthorn, elder, blackthorn and dogwood (*Cornus sanguinea*), with common nettle and hogweed in the ground flora.

A1.18 H5 is around 4m high and 3m wide and box cut with some gaps at the base. Species present comprise dogwood, hawthorn, elder, blackthorn and pedunculate oak (*Quercus robur*), with very sparse ground flora.

A1.19 Hedgerows H6, H7 and H13 are continuations of the same hedgerows. These hedgerows are around 10m tall and 3m wide and are managed with cut sides. Species present include ash, blackthorn, hawthorn, elm and elder, with lords and ladies (*Arum maculatum*) in the ground flora.

A1.20 H8 is around 7m tall and 2m wide and is box cut. Species present include hawthorn, blackthorn, ash and oak, with common nettle and cleavers in the ground flora.

A1.21 H9 is around 7m tall and 3m wide and is box cut. Species present comprise hawthorn, blackthorn and field maple, with a very sparse ground flora.

A1.22 H10 is around 6m tall and 2m wide and is box cut, comprising elder, hawthorn and blackthorn with very sparse ground flora.

A1.23 The hedgerows within the Site are mostly regularly flailed, which reduces their value for wildlife, and the hedgerows are all species-poor. Given their limited species diversity and intensive management, the hedgerows are of low to moderate distinctiveness (those with trees being of greater interest) and of Site- to Local-level ecological importance.

Trees

A1.24 There are tree belts and scattered trees at the boundaries of the Site, as well as a small number of individual trees.

A1.25 Species present include pedunculate oak, aspen (*Populus tremula*), hazel, willow, hawthorn, blackthorn, elder, ash, elm and field maple. In addition, there is a line of non-native coniferous trees associated with the southern boundary of the soil bund south of the farm buildings.

A1.26 The tree belts are of moderate distinctiveness and Local-level ecological importance, given their structure and species diversity. However, the scattered trees and coniferous trees are considered to be of low distinctiveness and Site-level ecological importance.

Semi-natural Woodland

A1.27 There is a small area of semi-natural woodland present in the west of the Site (W1), the southern part of which is ASNW. In addition, there is a wooded belt present along the western boundary of the Site, along the M40 (W2) (see **Image EDP A1.3**).

A1.28 Species present within W1 are dominated by ash and oak trees with willow encroaching into the central pond and aspen along the field margins. Overgrown hazel stands dominate the understorey, with blackthorn thickets present in the north of this woodland, outside the ASNW. Elder and hawthorn are present round the field margins, with elm also present. The ground flora is very limited as sheep have access to graze within this woodland, but species present include common nettle and lords and ladies.

A1.29 Woodland W2 borders the western boundary of the Site as well as the M40 to the west. This woodland is dominated by aspen and ash with occasional willow and oak, and with elder, hawthorn and elm in the understorey. The ground flora includes is dominated by garlic mustard (*Alliaria petiolata*) with frequent common nettle and lords and ladies, and rarely found lesser celandine (*Ficaria verna*) and cleavers.

A1.30 The semi-natural woodland within the Site, in particular the area of ASNW, is of greater ecological importance within the context of the Site.

Image EDP A1.3: Semi-natural ancient woodland W1.

Dense Scattered Scrub

A1.31 There are small areas of dense scattered scrub associated with boundary features of field F10.

A1.32 Species present are dominated by bramble, with hawthorn, blackthorn and elder also present and common nettle at the margins.

A1.33 This habitat is of Negligible ecological importance, comprising common and widespread species and being of low habitat distinctiveness.

Pond

A1.34 There is a single pond within the Site (P1) that is located in the west of the Site and is surrounded by semi-natural woodland (see **Image EDP A1.4**).

A1.35 Pond P1 is a large, heavily shaded pond within woodland W1 that is being encroached by willow and there is no aquatic vegetation present other than a covering of duckweed (*Lemna minor*). There are a variety of steep and sloping banks with lots of fallen trees in the water.

A1.36 The pond within the Site is only of Site-level ecological importance given its overshaded nature, lack of aquatic vegetation and it has been found not to support great crested newts (as described elsewhere in this report).

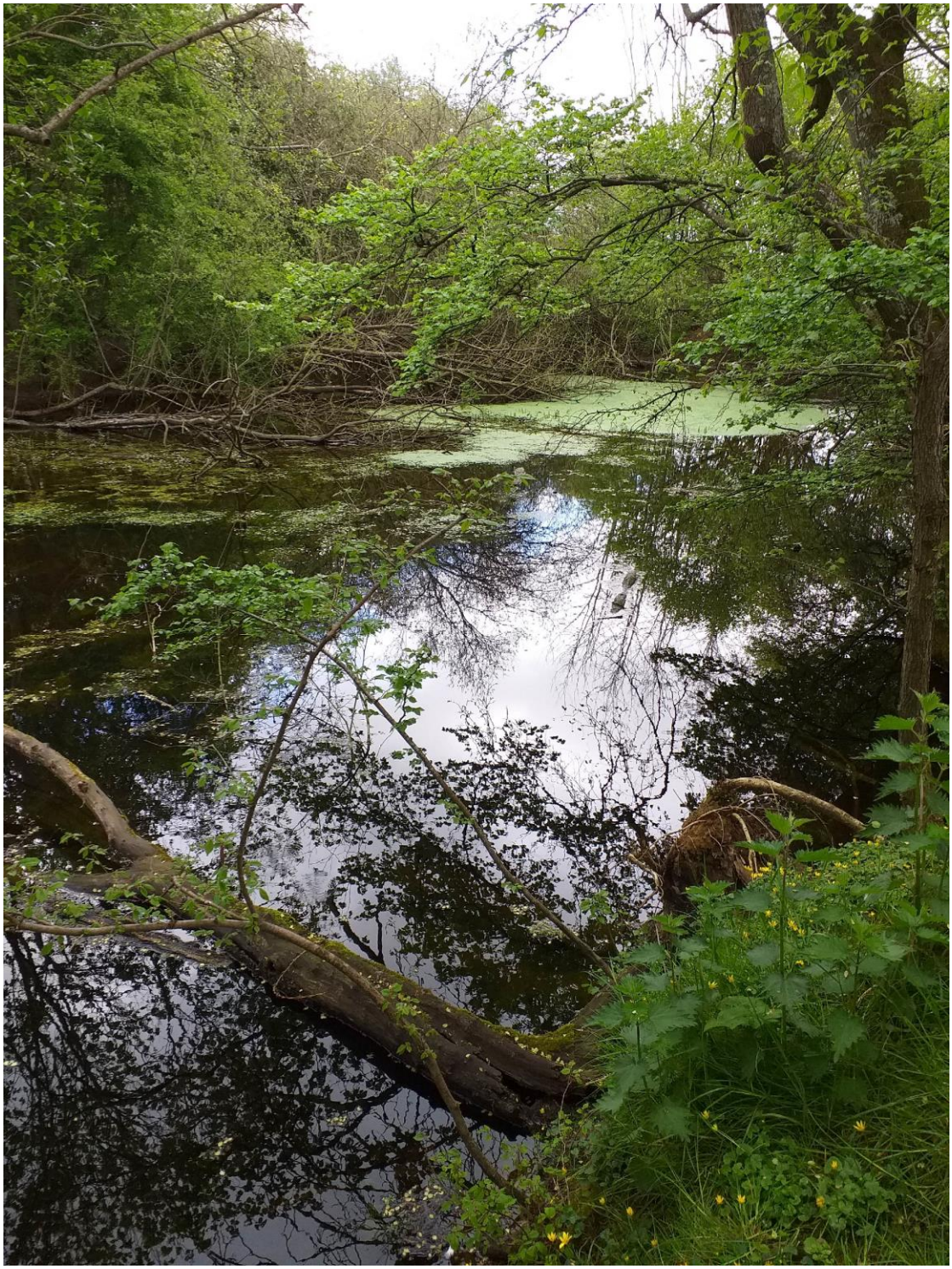

Image EDP A1.4: Pond P1.

Wet Ditches

A1.37 There is a wet ditch (S2) that runs along the western boundary of the Site and through the southern part of the Site, that is connected to a wet ditch (S1) flowing to the north of S2.

A1.38 The wet ditch (S2) is around 50cm deep in winter and dries to only around 10cm during summer. The wet ditch is also overshaded by the adjacent hedgerow through the south of Site and the woodland along the western boundary of the Site.

A1.39 There are pollarded willows along the length of this wet ditch as well as a hedgerow. Species present in this wet ditch include abundant fool's watercress (*Apium nodiflorum*) and rarely found yellow flag iris (*Iris pseudacorus*) within the channel, with willowherb (*Epilobium* sp.), bramble and common nettle along the banks.

A1.40 The wet ditch that flows north of S2 (S1) has been mechanically dug out and is around 1-1.5m wide. The water level is very shallow, being around 30cm in winter and almost dries during summer. Species are the same as found within S2.

A1.41 Wet ditch S2 is of low distinctiveness and does not support any notable or protected species such as otter or water vole, as set out in **Annex EDP 6**. However, owing to its importance in the linear habitat network, being linked to the wider landscape including Bowlers Copse CDWS into which it flows, it is judged to be of Local-level ecological importance.

Bare Ground

A1.42 There are areas of cleared and bare ground associated with the soil bunds of tall ruderal vegetation. These areas are subject to regular disturbance and ground clearance works.

A1.43 The bare ground is of Negligible intrinsic ecological importance.

Buildings

A1.44 There are six buildings within the Site, all of which comprise open-sided farm buildings used for housing animals and storage of materials and farm equipment. The buildings have pitched and domed, corrugated metal and asbestos roofs, some of which have skylights, and the warehouses are constructed with metal frames. Where there are walls present, these are constructed of corrugated metal and wooden boarding.

A1.45 Given the frequent disturbance, all of the on-site buildings offer negligible potential for breeding birds or roosting bats. This is discussed further, in relation to bats, in **Annex EDP 5**.

A1.46 The buildings are considered of Negligible intrinsic ecological importance.

Hardstanding

A1.47 There is a large area of hardstanding associated with the buildings in the north of the Site, as well as a small access track off the A41 in the south of the Site.

A1.48 This habitat is of Negligible ecological importance.

Annex EDP 2
Hedgerow Survey

Methodology

A2.1 All of the hedgerows within the Site were assessed by an experienced EDP Ecologist on 18 June 2018 to determine if they qualify as ecologically 'Important' under the Hedgerows Regulations (1997). Following updated walkover surveys in 2021, there were deemed to have been no material changes to the hedgerows present and as such updated Hedgerow Regulations (1997) surveys were not carried out.

A2.2 Reference was made to the Wildlife and Landscape criteria provided in Part II of Schedule 1 of the Hedgerows Regulations (1997) to determine the ecological importance of the hedgerows.

A2.3 The Hedgerow Regulations (1997) serve the purpose of ensuring the retention of important countryside hedgerows, their removal only being approved by the relevant Local Authority.

A2.4 The aims of the hedgerow assessment were to:

- Identify hedgerows that are classified as 'Important' under the ecological criteria of the Hedgerow Regulations (1997); and

- Identify hedgerows that, although not deemed 'Important' under the ecological criteria of the Hedgerow Regulations (1997), have ecological value in terms of species diversity or as potential wildlife corridors.

A2.5 Details of the hedgerows surveyed are provided in **Table EDP A2.1** and the hedgerow numbers are given on **Plan EDP 1**.

A2.6 Hedgerows qualify for assessment by exceeding 20m in length or by being connected at both ends to another hedgerow of any length. The middle 30m of all hedgerows up to 100m in length were surveyed, whilst two 30m sections were surveyed for hedgerows up to 200m in length where access was possible. For hedgerows exceeding 200m in length, three 30m sections were surveyed. Hedgerows surveyed were assigned points dependent upon the number of qualifying 'features' as defined by the Hedgerows Regulations, with total scores per hedgerow determining their status.

A2.7 Qualifying as an 'Important' hedgerow requires the hedgerow assessed to be greater than 30 years of age and contain species listed in Schedule 5 (animals) and 8 (plants) of the Wildlife and Countryside Act 1981 (as amended), birds categorised as declining breeders

(Category 3) within the Birds of Conservation Concern (BoCC) 4 (Eaton *et al*, 2015)[11], or any species categorised as 'endangered', 'extinct', 'rare' or 'vulnerable' by any of the British Red Data Books.

A2.8 Hedgerows are also considered important should they satisfy any of the following criteria:

- That the hedgerow is referred to in a record held by a biological records centre as containing protected plants (within ten-years) or birds and animals (within five-years); or

- That the hedgerow contains one of the following criteria per average 30m section surveyed:

    - Seven Schedule 3 species;

    - Six Schedule 3 species and three listed features (see below);

    - Six Schedule 3 species, including one of the following: black poplar, large-leaved lime, small-leaved lime or wild service-tree;

    - Five Schedule 3 species and four listed features; or

    - Four Schedule 3 species, two listed features and lying adjacent to a bridleway or footpath.

- Listed features to include:

    - A bank or wall which supports the hedgerow along at least half of its length;

    - Gaps which together do not exceed 10% of the length of the hedgerow;

    - At least one standard tree per 50m of hedge;

    - At least three Schedule 2 woodland species within the hedgerow;

    - A ditch along at least one half of the length of the hedgerow;

    - Connections scoring four points or more (one point per connection of the hedgerow with another, two points per connection of the hedgerow to a pond or broad-leaved woodland; and

    - A parallel hedge within 15m of the hedgerow.

[11] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L.., Musgrove, A.J., Noble, D.G., Stroud, D.A. and Gregory, R.D. (2015). *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds, Vol. 108, 708-746

A2.9 Where a hedgerow did not meet the 'important' hedgerow criteria, it was considered whether this boundary feature had ecological value, in terms of species diversity, or as potential wildlife corridors.

Results

A2.10 The detailed results of the hedgerow survey are provided in **Table EDP A2.1**. As set out in this table, none of the hedgerow sections were found to qualify as 'important'.

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Table EDP A2.1: Hedgerow Regulations Assessment 2018.

Hedgerow Number	Hedgerow Description and Notes	Woody Species (Recorded within the Entire Length of the Hedgerow)													Mean Count of Schedule 3 Species from the 30m Samples	Schedule 2 and 3 Woodland Plants	Additional Features						Adjacent footpath, Bridleway, Road Used as Public Path or Byway Open to all Traffic?	Important Hedgerow
		Schedule 3 Species															Bank/Wall	Gaps <10%	Standard Trees	Ditch	Connections (>4)	Parallel Hedge		
		Blackthorn (*Prunus spinosa*)	Hawthorn (*Crataegus monogyna*)	Dogwood (*Cornus sanguinea*)	Elder (*Sambucus nigra*)	Elm sp. (*Ulmus spp.*)	Ash (*Fraxinus excelsior*)	Field maple (*Acer campestre*)	Oak, penduculate (*Quercus robur*)	Willow (*Salix sp.*)	Hazel (*Corylus avellana*)	Plum (*Prunus communis*)	Whitebeam (*Sorbus aria*)	Rose (*Rosa sp.*)	Cherry (*Prunus avium*)										
H1	Slightly outgrown box cut hedgerow with some gaps at base.		✓		✓	✓		✓		✓			✓			3.6			✓	✓	✓			✓	×
H2	Slightly outgrown box cut hedgerow with some gaps at base.	✓	✓		✓	✓	✓			✓						4.3			✓		✓		✓		×
H3	Slightly outgrown box cut hedgerow with some gaps at base.		✓		✓			✓								3			✓	✓	✓				×
H4	Slightly outgrown box cut hedgerow with some gaps at base.	✓	✓	✓	✓	✓		✓								3.6			✓		✓				×
H5	Slightly outgrown box cut hedgerow with some gaps at base.	✓	✓	✓	✓				✓							4			✓	✓					×
H6	Outgrown hedgerow with trees, along wet ditch.	✓	✓		✓	✓	✓							✓		4	1				✓				×
H7	Outgrown hedgerow with trees, along wet ditch.	✓	✓		✓	✓	✓									4	1				✓			✓	×
H8	Box cut hedgerow with little ground flora	✓	✓				✓		✓							2.3				✓	✓				×
H9	Box cut hedgerow	✓	✓					✓								2.5									×
H10	Short section of hedgerow	✓	✓		✓											3									×
H11	Hedgerow with managed sides	✓	✓		✓		✓	✓	✓		✓	✓				5									×
H12	Hedgerow with managed sides															4									×
H13	Outgrown hedgerow with trees, along wet ditch.	✓	✓		✓	✓	✓									4	1				✓	✓			×
H14	Outgrown scrubby hedgerow	✓	✓			✓	✓	✓							✓	5				✓					×
H15	Outgrown scrubby hedgerow	✓				✓	✓	✓								4		✓		✓					×

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Annex EDP 3
Wintering Bird Survey

Methodology

A3.1 The Site supports habitats suitable for over-wintering birds and a number of records of protected/notable species were returned from the desk study. A single 'pilot' winter bird survey (WBS) was undertaken on 22 December 2018 to assess the Site's potential to support notable flocks of BoCC and to determine whether further detailed survey work would be necessary to inform the planning application.

A3.2 The pilot survey was undertaken with reference to standard methodology, entailing a modified CBC approach, which involves walking to within 100m of each part of the Site and recording all notable species using habitat features. This ensures that the survey identifies all birds using the margins of the Site, as well as those in the interior. Birds flying over are generally ignored unless deemed to be interacting with the Site in some way.

A3.3 The survey was carried out on 22 December 2018, which is an appropriate time of year for the locality in order to assess its wintering bird interest. The survey was undertaken during suitable weather conditions: wind was low, visibility high dropping to moderate but at the end of the survey, and there was no rain. It is therefore considered that the results provide a representative overview of the winter bird resource at the Site.

A3.4 An assessment of the individual bird species recorded within the Site, as well as the overall assemblage, has been made with reference to the national conservation status of the different species according to the following key lists/criteria:

- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) – affords greater protection to certain breeding species that are considered appropriately at risk nationally and are listed additional protection under Schedule 1 accordingly;

- BoCC 4: the population status of birds in the UK [12], Channel Islands and Isle of Man – Under this approach UK bird populations are assessed, using quantitative criteria, to determine the population status of each species and then placed on one of three lists; Red, Amber or Green:

    - Red List species are of high conservation concern, being either globally threatened, having historical UK population declines between 1800 and 1995 or a rapid population decline, or breeding range contraction by 50% or more in the last 25 years;

[12] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L.., Musgrove, A.J., Noble, D.G., Stroud, D.A. and Gregory, R.D. (2015). *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds, Vol. 108, 708-746.

- Amber List species are of medium conservation concern due to a number of factors, for example having suffered between 25% and 49% contraction of UK breeding range, or a 25–49% reduction in breeding or non-breeding populations over the last 25 years. Species that have a five year mean of 1–300 breeding pairs in the UK, or an unfavourable European conservation status, or for which the breeding population in the UK represents 20% or more of the European breeding populations are also listed on the Amber List; and

- Green List species have a favourable conservation status; and

- Species of Principal Importance included under Section 41 (England) of the NERC Act 2006.

Limitations

A3.5 It is considered that the level of survey undertaken provides a sufficient overview of the bird community within the Site. However, it should be noted that this level of survey will typically not provide exact population figures for each species. This can be particularly true for cryptic or skulking species, or species that inhabit areas that are difficult to access, such as dunnock. Towards the end of the survey some mist was recorded, although given this occurred at the end of the survey, and did not impede survey of the entire site, it is not considered this adversely affected the species recorded. Overall, it is considered that a sufficient assessment of the Site's value to wintering birds has been made to inform this Ecological Baseline assessment.

Results

A3.6 A large number of records for birds were returned from the desk study. Of these, 20 are considered to be pertinent notable species to the habitats within the Site are barn owl, bullfinch, fieldfare, herring gull, house sparrow, lesser redpoll, lesser spotted woodpecker, linnet, mistle thrush, red kite, redwing, reed bunting, skylark, song thrush, starling, stock dove, and yellowhammer.

A3.7 The pilot wintering bird survey undertaken on 22 November 2018 recorded only a small number of species within the Site, and no significant flocks of species. A total of six species of conservation concern were recorded within the Site: starling, yellowhammer, redwing, bullfinch, stock dove and dunnock.

A3.8 A summary of those species of conservation concern recorded during the survey is provided in **Table EDP A3.1** and illustrated on **Plan EDP 4**.

Table EDP A3.1: Protected/Notable Bird Species Recorded During the Pilot Wintering Bird Survey within the Site

Species	Conservation Status	Local Status	2018 Observations
Starling (*Sturnus vulgaris*)	Red List, NERC s.41	Widespread winter visitor with much reduced breeding distribution	Small numbers flying over the Site
Yellowhammer (*Emberiza citrinella*)	Red List, NERC s.41	Common resident. Some evidence of a major decline	Two individuals together in north of the Site
Redwing (*Turdus iliacus*)	Red List, Sch. 1 WCA	Very common winter visitor and passage migrant	Small numbers within the Site
Bullfinch (*Pyrrhula pyrrhula*)	Amber List, NERC s.41	Common resident	Male and female flying within the Site
Stock dove (*Columba oenas*)	Amber List	Numerous resident	Two flying over the Site
Dunnock (*Prunella modularis*)	Amber List, NERC s.41	Common and widespread resident	One off-site to north-east, associated with buildings.

A3.9 In addition to those species listed above, 17 Green Listed species were also observed within the Site. These were all in low abundance, with just a few of each species recorded. A list of species recorded is included in **Table EDP A3.2**.

Table EDP A3.2: Additional Bird Species Recorded During the Pilot Wintering Bird Survey within the Site

Species	Local Status
Woodpigeon (*Columba palumbus*)	Very numerous resident
Magpie (*Pica pica*)	Common resident
Rook (*Corvus frugilegus*)	Very abundant resident
Carrion Crow (*Corvus corone*)	Very numerous resident and increasing
Blue tit (*Cyanistes caeruleus*)	Abundant throughout the county
Pied Wagtail (*Motacilla alba*)	Common breeding resident
Wren (*Troglodytes troglodytes*)	Very common resident
Blackbird (*Turdus merula*)	Abundant and ubiquitous resident
Robin (*Erithacus rubecula*)	Very common and familiar resident
Raven (*Corvus corax*)	Increasingly regular with a small breeding population
Goldfinch (*Carduelis carduelis*)	Common resident, passage migrant and winter visitor
Jackdaw (*Corvus monedula*)	Numerous resident
Great tit (*Parus major*)	Abundant resident
Chaffinch (*Fringilla coelebs*)	Abundant resident and winter visitor
Buzzard (*Buteo buteo*)	Fairly common breeding resident
Long-tailed tit (*Aegithalos caudatus*)	Common resident
Great spotted woodpecker (*Dendrocopos major*)	Numerous resident

A3.10 The species assemblage recorded across the Site is typical of an urban edge farmland site with an open character. Species diversity is considered to be low for a site of this size and abundance of species present is considered to be typical of a site of this size and type.

A3.11 Although species of conservation concern are present in low numbers, the habitat is not considered to be atypical for the region and therefore is unlikely to be of vital importance to these species. The numbers recorded were low. With this in mind, along with the abundance of suitable habitat across the wider landscape, the populations present are not considered to be of more than Local-level importance.

A3.12 It is possible that the Site could support additional species, which were not recorded during the pilot survey, although it is considered unlikely that any populations present would be important at more than a Local-level.

Annex EDP 4
Breeding Bird Surveys

Methodology

A4.1 Breeding bird surveys were undertaken in 2018 with reference to a standard methodology, entailing a modified CBC 'territory mapping' approach. This involved three visits to the Site, undertaken between approximately mid-April and early July; the height of the breeding bird season for lowland Britain. A single updated breeding bird surveys was carried out in 2021 to determine whether there had been any material changes to the findings of the previous surveys.

A4.2 Following best practice, the survey visits were timed to start around first light, to coincide with the period of peak activity for birds, most particularly passerine songbird species. They were also undertaken during suitable weather conditions. Days/periods with strong winds and heavy or persistent rain were generally avoided. It is therefore considered that the results are not significantly limited by seasonal or climatic factors.

A4.3 The dates and timings of all four survey visits and the weather conditions encountered are summarised within **Table EDP A4.1**.

Table EDP A4.1: Background Information of the Breeding Bird Survey Visits in 2018 and 2020

Visit	Date	Time	Cloud (%)	Rain (% of survey)	Wind (Beaufort)	Temp (°C)	Visibility
1	12.4.18	06:30–09:30	100	0	2	8	Moderate
2	16.5.18	05:00–08:00	100	5	6	12	Good-moderate
3	26.6.18	05:00–08:45	100	0	4	13	Good
4	6.4.21	06:30–09:30	50	0	3	5	Good

A4.4 The survey methodology involved walking to within c.50m of all parts of the Site and recording all birds listed within the BoCC report[13] and their activity status, with a particular emphasis placed upon those elements considered to relate to, or be indicative of, breeding. This ensured that the survey identified all birds using the margins of the Site, as well as those in the interior. Following the completion of the survey, the breeding status of each bird species identified at the Site was determined according to the nature and frequency of the behavioural elements recorded, as set out in **Table EDP A4.2**.

[13] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. and Gregory, R.D. (2015). *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds, Vol. 108, 708-746.

Table EDP A4.2: Summary of Field Evidence Used to Determine Breeding Bird Status

Status	European Bird Census Council (EBCC) Criteria for Categorisation of Breeding Status
Confirmed	• Distraction-display or injury feigning; • Used nest or eggshells found (occupied or laid within period of survey); • Recently fledged young (nidicolous species) or downy young (nidifugous species); • Adults entering or leaving nest-site in circumstances indicating occupied nest (including high nest or nest-holes, the contents of which cannot be seen) or adult seen incubating; • Adult carrying faecal sac or food for young; • Nest containing eggs; or • Nest with young seen or heard.
Probable	• Pair observed in suitable nesting habitat in breeding season; • Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two different days a week or more apart at the same place; • Courtship and display; • Visiting a probable nest site; • Agitated behaviour or anxiety calls from adults; • Brood patch on adult examined in the hand; or • Nest building or excavating nest-hole.
Possible	• Species observed in breeding season in possible nesting habitat; or • Singing male(s) present (or breeding calls heard) in breeding season.
Non-breeder	• Feeding birds only; • Birds flying over only; or • Lack of suitable breeding habitat.

A4.5 To provide further detail with regards to the total assemblage of bird species present within the Site, a list of all other bird species recorded (i.e. those that are not considered to be of conservation concern) was made for each survey visit.

A4.6 The breeding bird survey was carried out by an experienced Ornithologist, at an appropriate time of year for the locality and in suitable weather conditions. It is therefore considered that the results provide a representative overview of the breeding bird interest at the Site.

A4.7 An assessment of the individual bird species recorded at the Site, as well as the overall assemblage, was subsequently made with reference to the National and Local conservation status of the different breeding species recorded according to the BoCC report and Birds of Oxfordshire 2019 (BoO 2019)[14].

A4.8 An assessment of the individual bird species recorded in the Site, as well as the overall assemblage, has been made with reference to the national conservation status of the different breeding species according to the following key lists/criteria:

[14] Birds of Oxfordshire 2019, Oxford Ornithological Society

- Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) – affords greater protection to certain breeding species that are considered appropriately at risk nationally and are listed additional protection under Schedule 1 accordingly;

- BoCC in England – Under this approach UK bird populations are assessed, using quantitative criteria, to determine the population status of each species and then placed on one of three lists; Red, Amber or Green:

    - Red list species are of high conservation concern, being either globally threatened, having historical UK population declines between 1800 and 1995 or a rapid population decline, or breeding range contraction by 50% or more in the last 25 years;

    - Amber list species are of medium conservation concern due to a number of factors, for example having suffered between 25% and 49% contraction of UK breeding range or a 25–49% reduction in breeding or non-breeding populations over the last 25 years. Species which have a five year mean of 1–300 breeding pairs in the UK, or an unfavourable European conservation status, or for which the breeding population in the UK represents 20%, or more of the European breeding populations are also listed on the Amber list; and

    - Green list species have a favourable conservation status; and

- Species of Principle Importance (Priority Species) included under Section 41 (England) of the Natural Environment and Rural Communities (NERC) Act 2006.

Limitations

A4.9 The surveys were carried out by an experienced ornithologist, at an appropriate time of year for the locality, and in suitable weather conditions. It is therefore considered that the results provide a representative overview of the breeding bird interest at the study area. Although the single update survey in 2021 cannot be used to determine breeding status for this year, it is a useful indicator to changes in the overall species assemblage for the Site.

Results

A4.10 The results of the information received by TVERC is set out above, and the Site is considered to support habitat for a range of bird species that would commonly be associated with the urban fringe and agricultural habitats present.

A4.11 The following paragraphs summarise the results of the breeding bird surveys with respect to species richness, abundance and distribution. Thereafter, an evaluation of the importance of the overall assemblage and individual species at the Site is provided.

Species Richness

A4.12 A total of 26 bird species were recorded within and adjacent to the Site during the three breeding bird survey visits completed during 2018, with 26 species also recorded during the update visit in 2021, five of which were new species to the Site (none of which are species of conservation concern).

A4.13 Of those species recorded in 2018, one species was confirmed as breeding (jackdaw). In addition, 14 species were recorded as probable breeders, as it was not possible to provide confirmation of breeding (blackbird, blackcap, blue tit, buzzard, collard dove, dunnock, goldfinch, great tit, linnet, robin, skylark, song thrush, whitethroat, and wren). A further eight species were recorded as possible breeders, being observed in 'suitable' habitat (great spotted woodpecker, greenfinch, mistle thrush, pheasant, pied wagtail, red kite, starling, and stock dove).

A4.14 Due to only one visit being undertaken in 2021, it is not possible to update with confidence the breeding status of the majority of the species observed during these update surveys. However, ten species displaying possible breeding behaviour in 2021 were also recorded as displaying possible breeding behaviour in 2018, and one new species, lesser whitethroat, was also recorded as displaying possible breeding behaviour in 2021. The remaining species were regarded as 'non-breeders' because they were not observed to display any territorial behaviour or because their distribution indicates there is no suitable habitat for them within the boundary of the Site.

Abundance

A4.15 Only one possibly breeding species was confirmed to have populations in double figures in 2021: woodpigeon.

A4.16 This species is a common and abundant resident species, and although the number of breeding pairs for this species cannot be confirmed for 2021, individuals and small flocks were recorded scattered across the Site in 2021.

Distribution

A4.17 In general, species are distributed across the Site, generally associated with the boundary features, although with slightly higher numbers recorded associated with the woodland in the west of the Site, and associated with wet ditch S2.

A4.18 Only very low numbers of birds were recorded within the grassland fields themselves, with only occasional skylark recorded, twice in F4 within the Site (April 2018 and April 2021) with one male recorded singing in 2018 and two males recorded singing in 2021. Given that only individual or very small numbers of skylark were recorded at the start of the breeding season, it is considered that the Site only supports a very small population that may not breed successfully within the Site, given the presence of grazing within the fields that maintains the grass with a short sward height.

A4.19 The majority of the other species recorded breeding or possibly breeding within the Site are generally associated with and urban fringe habitat.

Non-breeding Species

A4.20 These species include buzzard and red kite associated with the woodland area along the M40 corridor. However, no breeding by these species was confirmed within the Site.

A4.21 The other non-breeding species present are generally common and widespread species that are associated with urban fringe habitats.

A4.22 Protected and notable species recorded during the 2018 breeding bird surveys are set out in **Table EDP A4.3**, including notes from the 2021 update survey in the Observations section. Sightings of protected and notable species made during the surveys are illustrated on **Plans EDP 5** to **8**.

Table EDP A4.3: Protected/Notable Bird Species Recorded During the Survey within the Site.

Species	On-site Breeding Likelihood	Observations	Conservation Status[15]
Starling (*Sturnus vulgaris*)	Not likely breeding	Small flocks recorded during the surveys	Red List; NERC s.41
Skylark (*Alauda arvensis*)	Possible breeding (0-2 pairs)	Maximum of two males singing	Red List; NERC s.41
Linnet (*Linaria cannabina*)	Possible breeding (1-2 pairs)	Maximum of two individuals recorded	Red List; NERC s.41
Song thrush (*Turdus philomelos*)	Possible breeding (0-1 pairs)	Maximum of one individual recorded at any one time	Red List; NERC s.41
Mistle Thrush (*Turdus viscivorus*)	Possible breeding (0-1 pairs)	Maximum one recorded within the Site.	Red List
Mallard (*Anas platyrhynchos*)	Possible breeding (0-1 pairs)	A pair recorded in F5 on one occasion.	Amber List
Dunnock (*Prunella modularis*)	Possible breeding (1-6 pairs)	Maximum of six individuals recorded	Amber List; NERC s.41
Stock dove (*Columba oenas*)	Not likely breeding	Small flock recorded with a maximum of nine individuals on one occasion	Amber List

A4.23 Twenty-four generalist, Green-listed species were recorded within the Site (see **Table EDP A4.4**), though with 'hotspots' of activity located along the western boundary and the southern woodland. Species such as blackcap, chiffchaff, woodpigeon and wren were recorded as singing individuals.

[15] Eaton, M.A., Aebischer, N.J., Brown, A.F., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A. and Gregory, R.D. (2015). *Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man*. British Birds, Vol. 108, 708-746.

Table EDP A4.4: Green Listed Bird Species Recorded During the Surveys within the Site.

Species
Green listed
Blackbird (*Turdus merula*)
Blackcap (*Sylvia atricapilla*)
Blue tit (*Cyanistes caeruleus*)
Buzzard (*Buteo buteo*)
Chiffchaff (*Phylloscopus collybita*)
Collared dove (*Streptopelia decaocto*)
Goldfinch (*Carduelis carduelis*)
Great spotted woodpecker (*Dendrocopos major*)
Great tit (*Parus major*)
Green woodpecker (*Picus viridis*)
Greenfinch (*Chloris chloris*)
Jackdaw (*Corvus monedula*)
Lesser whitethroat (*Sylvia curruca*)
Magpie (*Pica pica*)
Pheasant (*Phasianus colchicus*)
Pied wagtail (*Motacilla alba*)
Red Kite (*Milvus milvus*)
Robin (*Erithacus rubecula*)
Rook (*Corvus frugilegus*)
Sparrowhawk (*Accipiter nisus*)
Swallow (*Hirundo rustica*)
Whitethroat (*Sylvia communis*)
Woodpigeon (*Columba palumbus*)
Wren (*Troglodytes troglodytes*)

Evaluation

A4.24 As set out previously the current national and local conservation status of the 26 'confirmed' or 'possible' breeding birds at the Site has been determined and the paragraphs below evaluate the importance of (1) the different species supported and (2) the overall assemblage.

Schedule 1 Species

A4.25 A single statutorily protected 'Schedule 1' bird species, red kite, was recorded adjacent to the Site during visits in 2018 and 2021. In 2018, a maximum of two individuals were recorded together in June 2018. In 2021, a maximum of one individual was recorded. These individuals were generally recorded flying over the wider area, near to tree belts, and no evidence of breeding behaviour was recorded within the Site. However, it is considered the woodland and tree belts adjacent to the Site, along the M40 corridor,

offer suitable habitat for this species to breed. The single pair and individual adult are evaluated to be of no greater than Local-level ecological importance.

A4.26 Whilst not recorded during the breeding bird surveys, a sighting of barn owl was made during the bat transect survey in May 2021 (see **Plan EDP 2**). During this transect survey, a barn owl was observed flying out of T30 within hedgerow H5 to the south-west of the farm buildings. Based on the survey evidence, it is considered that barn owl hunts/forages within the Site but breeding has not been confirmed. This species is considered to be of no greater than Local-level ecological importance.

Red List Species

A4.27 There were five 'Red List' bird species recorded within the Site, four of which were considered to possibly be breeding, these being song thrush, skylark, linnet and mistle thrush. No additional Red List species were recorded in 2021.

Starling

A4.28 A maximum of seven individuals were noted during the survey in 2021, with a maximum of four individuals during the surveys in 2018. No evidence of breeding or possible breeding was recorded for this species, and it is considered this species is only using the habitats within the Site for foraging. Starling are a common and widespread species across the UK, although their numbers have decreased in recent years. In Oxfordshire they are a widespread winter visitor but with a much-reduced breeding distribution in the last 40 years (BoO 2019).

Skylark

A4.29 As stated above, only occasional skylark were recorded within the Site, with a maximum of two males recorded at any one time (April 2018 and April 2021), and it is considered that the Site only support a very small population (0–2 pairs) that may not breed successfully within the Site, given the presence of grazing within the fields that maintains the grass with a short sward height. This species has been 'Red Listed' because it has experienced a greater than 50% decline in its UK breeding population over the course of the last 25 years, although there has been an increase in numbers in Oxfordshire from 2018 to 2019, where this species is regarded as being a common resident and passage migrant (BoO 2019). This species is widespread throughout the UK both in winter and breeding. It is probable that the on-site breeding population of skylark at the Site is considered to be of value at the Site-level only.

Linnet

A4.30 A maximum of three individuals were recorded within the Site, with a maximum of two pairs recorded in 2021. Distribution of this species within the Site is limited to the hedgerow along S2 and hedgerow H9. It is considered that the Site supports a very small population of 1–2 pairs, although possible breeding behaviour was only noted on one occasion during the survey, in May 2018. Despite being 'Red Listed' at the National level,

records of this species remain consistently high in Oxfordshire, where it is a common resident species, as well as a passage migrant and winter visitor (BoO 2019). Linnet are widespread throughout lowland areas of the UK. Therefore, the on-site population of linnets is considered to be of value at the Site and immediate environs level only.

Song Thrush

A4.31 The population of song thrush is estimated to be around 1–2 pairs, with individuals recorded within or adjacent to the Site in 2018 and 2021. Song thrush have been recorded associated with S2 on three of the four surveys, and associated with S1 on one occasion, with individuals also recorded associated the boundaries of F1, and within hedgerow H9. Evidence of possible breeding was recorded, and it is considered the population within the Site is low. Despite being 'Red Listed' as a bird of conservation concern, this species remains a common resident species but one which is considered to be declining in suburban areas in the county, although there remain strong autumn immigration and winter populations (BoO 2019). Song thrush are widespread throughout the UK with the exception of the highlands of Scotland. Therefore, the song thrush population is evaluated as being of value at the Site and immediate environs level only.

Mistle Thrush

A4.32 An individual mistle thrush was recorded along wet ditch S1 during the survey in April 2018, and as such the population within the Site is considered to be 0–1 pairs, with no evidence of breeding having been recorded. 2019 saw a record number of mistle thrush records in Oxfordshire, and this species remains a common resident in the county, with little or no evidence of migration (BoO 2019) The population of mistle thrush is therefore considered to be of value at the Site-level only.

Amber List Species

A4.33 Three 'Amber List' bird species were recorded within the Site, of which only dunnock was at least a possible breeder in 2018.

Mallard

A4.34 A single pair of mallard was observed in the east of F5 in April 2018, with no confirmed breeding evidence, and this species was not recorded during any other surveys. As such, it is considered the population present is 0–1 pairs. The species is 'Amber-Listed' at the National level but is still regarded as being a common breeding species both nationally and regionally, so the on-site population is of Negligible importance'.

Dunnock

A4.35 A maximum of five individuals were recorded during the 2018 surveys, with six individuals recorded in 2021. This species was widely distributed across the Site, associated with the hedgerows and woodland, and the population is estimated to be between 1–6 pairs. The species is 'Amber-Listed' at the National level but remains a common and widespread

species in Oxfordshire. Therefore, the on-site population of dunnocks is considered to be of value at the Site and immediate environs level only.

Stock Dove

A4.36 A maximum of eight stock dove were recorded within the Site, with small flocks recorded in April and June 2018. In 2018, this species was recorded associated with wet ditch S2, while in 2021, this species was recorded associated with the farm buildings, W1, as well as S2. No evidence of breeding or potential was recorded. Stock dove are commonly found as flocks in farmland, and this species is a 'numerous resident' in Oxfordshire (BoO 2019).

The Overall Assemblage

A4.37 The assemblage of bird species recorded at the Site is entirely typical for the diversity and quality of habitats present at a site in this geographic and topographic location. The species are common resident species, which are widespread in urban-fringe and agricultural habitats. The assemblage of breeding birds at the Site is therefore considered to be of no greater than Local-level importance as a whole.

Annex EDP 5
Bat Surveys

Methodology

A5.1 Due to the presence of suitable habitats for roosting, foraging and commuting bats within the Site, the following bat surveys were undertaken in 2018 and updated in 2021, with reference to national best practice guidelines[16]:

- Bat Roosting;
    - Daytime inspections of trees for bat roosting potential; and
    - Daytime inspections of building for bat roosting potential;
- Bat foraging/commuting activity;
    - Dusk and dawn manual transect surveys; and
    - Automated detector surveys.

Visual (Ground-level) Assessment of Trees

A5.2 A visual assessment of suitable trees within, or on the boundary of, the Site for the presence of, or potential to support roosting bats, was undertaken by a suitably experienced ecologist in accordance with Bat Conservation Trust (BCT) guidelines. The visual assessment was undertaken on 13 April 2018, during which the trees were searched as thoroughly as possible from ground level, with all elevations covered where accessibility allowed.

A5.3 Suitable features for roosting bats include:

- Loss/peeling/fissured bark;
- Natural holes e.g. rot holes and holes from fallen limbs;
- Woodpecker holes;
- Cracks/splits or hollow tree trunks/limbs; and
- Thick-stemmed ivy.

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

A5.4 Signs of roosting bats include:

- Bat(s) roosting *in-situ* – live, dead or skeletons;
- Bat droppings within or beneath a feature (hole or split);
- Staining around or beneath a feature;
- Oily marks (staining) around roost access points;
- Audible squeaking from the roost;
- Large/regularly used roosts or regularly used sites may produce an odour; and
- Flies around the roost, attracted by the smell of guano.

A5.5 Based upon the results of the visual assessment and features/evidence identified as above, the following ratings for trees were used during the assessment:

- Known or confirmed roost: European Protected Species (EPS) licence required for works to tree to be completed lawfully;
- High potential – Multiple highly suitable features capable of supporting large roosts;
- Medium potential – Definite bat roosting potential with fewer suitable features than High, but with one or two high quality features;
- Low potential –The tree supports one or two features which have limited potential for small numbers of roosting bats; and
- No potential – No potential to support roosting bats.

A5.6 A tree survey carried out on 07 October 2021 of the two trees identified as supporting roosts of individual potential noctule bats did not record any evidence of bats within either of these trees. However, both trees were noted to have a number of suitable roosting features that could accommodate noctule bats, and as such it is considered these trees represent occasional day roosts for individual noctules.

A5.7 Based on these surveys, the bat assemblage within the Site is still considered to be of Local-level value.

Limitations

A5.8 Visual assessments for roosting bats can be undertaken at any time of year; this assessment was therefore not limited by seasonal or climatic factors.

A5.9 It should be noted that this type of assessment is based on features visible from the ground level and is not considered to be a definitive bat roosting survey. Should the proposals require that any trees of sufficient potential to support roosting bats be subject to tree felling/surgery, additional survey work may be required to establish if any bats are roosting within the trees at the time of the proposed works. If trees are found to support bat roosts during pre-commencement investigations, such works would be subject to an EPS licence to commence lawfully.

Bat Roost Assessment of Buildings

A5.10 A visual assessment of buildings within the Site for the presence of, or potential to support roosting bats, was undertaken by a suitably experienced ecologist in accordance with BCT guidelines. External assessments were undertaken on 12 April 2018.

A5.11 All external features considered potentially suitable for bats were assessed, using a high powered torch, and binoculars from all aspects, where accessibility allowed. Suitable roost features in buildings include:

- Cracks/crevices in stone/brickwork/timber;
- Missing/broken/raised roof/ridge/hanging tiles;
- Loose/lifted lead flashing/bitumen felt;
- Loft voids (particularly if relatively undisturbed, potential bat access points present, clear flight space with simple truss formation, roof lining and insulation present);
- Gaps in soffits, barge boards or fascias; and
- Cavity walls with potential bat access.

A5.12 Signs of bat activity searched for were as described above.

A5.13 On this basis, the structures assessed were assigned a rating of potential suitability for roosting bats, from negligible to confirmed roost, as follows:

- Confirmed Roost: Evidence found;
- High potential: The building includes most of the features mentioned above (or many of one);
- Medium potential: The building includes two or three of the features or a moderate number of one;
- Low potential: The building includes one of the features; and
- Negligible potential: The building is not considered suitable for roosting bats.

Limitations

A5.14 Visual assessments for roosting bats can be undertaken at any time of year. As such, these investigations were not limited by seasonal or climatic factors.

A5.15 Bats are mobile animals and will move between a series of different roost sites, frequently establishing and occupying new roost sites depending on seasonal requirements and resources available locally. This survey, therefore, only provides a snapshot of the conditions present at the Site at the time of survey.

Manual Transect Surveys

A5.16 Manual transect surveys were undertaken across the Site to identify areas of bat foraging activity and commuting routes used by bats. Full details including the dates, timings and weather conditions of the transect surveys undertaken during 2018 and 2021 are given in **Table EDP A5.1**. The weather conditions during each visit were within the optimal range for bat surveys.

Table EDP A5.1: Date, Timing and Weather Conditions of Bat Activity Transect Surveys.

Survey Date	Survey Type	Survey Time	Sunset Time	Weather Conditions			
				Temp (ºC)	Cloud (%)	Rain	Wind (Beaufort scale)
18.4.18	Dusk	20:05-22:07	20:07	15-18	0	Nil	0-1
18.6.18	Dusk	21:27-23:27	21:27	17-19	100	Occasional light drizzle	3
19.6.18	Dawn	02:44-04:44	04:44	17	100	Nil	2
27.5.21	Dusk	21:09-23:09	21:09	12-16	50	Nil	1
8.7.21	Dusk	21:24-23:24	21:24	17-20	70	Nil	0
12.8.21	Dusk	20:34-22:34	20:34	16-19	100	Nil	4

A5.17 Manual transect surveys were completed by two experienced bat surveyors completing two transect routes covering the Site and wider area, one in the north of the Site and wider area and one in the south, with each surveyor completing one lap of the transect. Transect routes were designed to cover all boundaries and other potential foraging or commuting habitat within the Site, as illustrated on the Transect Activity plans (**Plans EDP 9** to **14**). Transect routes were walked at a slow and steady pace, with 'pacing points' used as a guide for the surveyors. All bats were recorded, and their behaviour marked on survey maps in order to characterise the value of the Site and its component habitats to foraging and commuting bats.

A5.18 Activity surveys were conducted using Elekon Batlogger M detectors. Observations of the time, location, and activity of all bats seen or heard were noted. Bats were identified on the basis of their characteristic echolocation calls, which were recorded and analysed using computer sonogram analysis software Bat Explorer, to confirm species identification. Species of *Myotis* sp. bat and long-eared bat (*Plecotus* sp.) are difficult to tell apart solely from their echolocation calls and are therefore grouped as such.

Limitations

A5.19 The identification of calls and species using call analysis software is dependent upon the quality of the recording made, which can be influenced by the following factors, which may limit levels of activity and species recorded:

- Weather conditions – rainfall and wind;
- Distance of bat from detector/surveyor;
- Presence of obstructions through which the noise must pass, i.e. trees; and
- Proximity of other noise sources such as roads.

A5.20 Bat detectors are naturally biased to record bat species that produce louder echolocation calls and may not record some bat passes of quieter echolocating species, such as long eared bats (*Plecotus* sp.).

A5.21 Although there was occasional light drizzle during the survey on 18 June 2018, it is not considered this affected the bat activity, and the weather conditions during the manual transect surveys completed in 2018 and 2021 were all considered to be within the optimal range.

A5.22 During the updated walkover surveys in 2021, it was noted that some trees previously recorded as having bat roosting potential had since fallen and be removed/partially removed from site.

Automated Detector Surveys

A5.20 To supplement the transect survey data, bat activity within the Site and wider area was also sampled using automated bat detectors, which automatically trigger and record bat echolocation calls. These surveys were conducted during the months of April, June and August 2018 and updated in the months of May, July and August 2021. The automated detectors provided a total of five recording periods lasting for a minimum of five consecutive nights each.

A5.21 Full details including the dates, timings and weather conditions for the automated surveys undertaken during 2018 and 2021 are given in **Table EDP A5.2**. The weather conditions during each visit were within the optimal range for bat surveys.

Table EDP A5.2: Date, Timing and Weather Conditions of Bat Automated Surveys.

Survey Month and Year	Survey Night	Weather Conditions				
		Sunset Temp. (ºC)	Temp. Range (ºC)	Cloud (%)	Rain	Wind (Beaufort scale)
April 2018	12.4.18	7	6-7	50-100	Occasional drizzle	1-3
	13.4.18	10	9-11	50-75	Nil	1-2
	14.4.18	13	9-10	0-50	Nil	2-3

Survey Month and Year	Survey Night	Weather Conditions				
		Sunset Temp. (ºC)	Temp. Range (ºC)	Cloud (%)	Rain	Wind (Beaufort scale)
	15.4.18	10	7-10	0-50	Nil	2-4
	16.4.18	11	10-11	0-50	Nil	3-4
	17.4.18	13	12-13	25-50	Nil	1-3
June 2018	13.6.18	16	9-14	50-75	Occasional light rain	3-4
	14.6.18	16	8-16	0-25	Nil	1-2
	15.6.18	15	12-15	25-50	Nil	1-2
	16.6.18	13	12-13	0-50	Nil	2-3
	17.6.18	15	14-15	25-50	Nil	1-3
	18.6.18	18	16-18	25-50	Nil	3-4
August 2018	8.8.18	17	14-17	0-50	Nil	1-2
	9.8.18	13	9-13	0-25	Nil	1-2
	10.8.18	14	5-14	0-25	Nil	1-2
	11.8.18	16	16-17	25-75	Nil	3-4
	12.8.18	16	15-16	25-75	Nil	2-3
	13.8.18	19	11-19	0-25	Nil	1-2
May 2021	27.5.21	15	8-15	0-25	Nil	1-2
	28.5.21	14	12-14	25-50	Nil	1
	29.5.21	14	5-13	0	Nil	1-3
	30.5.21	15	6-13	0-25	Nil	1-2
	31.5.21	17	11-16	0	Nil	1-4
	1.6.21	16	9-16	0	Nil	1-3
July 2021	8.7.21	18	14-18	0-75	Nil	1-2
	9.7.21	15	12-15	25-50	Nil	1-2
	10.7.21	13	12-13	25	Nil	1
	11.7.21	13	13-14	25-75	Nil	1-2
	12.7.21	18	10-18	0-25	Nil	0-1
August 2021	12.8.21	18	12-17	0-25	Nil	2-3
	13.8.21	19	13-19	0-25	Nil	2
	14.8.21	19	13-19	0-75	Nil	1-3
	15.8.21	17	11-17	0-25	Nil	1-3
	16.8.21	11	9-14	0-25	Nil	0-3

A5.22 Anabat Express bat detectors were deployed in three locations within and adjacent to the Site during the 2018 surveys, and in two locations within or adjacent to the Site during the 2021 update surveys, as shown on **Plans EDP 9** to **14**. The detectors were fixed in secure locations, with an external microphone attached 1–2m above ground and directed away from dense vegetation to maximise detection sensitivity. **Table EDP A5.3** gives the sampling dates and location details for the detectors.

Table EDP A5.3: Automated Detector Sampling Dates and Location Details.

Dates	Position	Adjacent/Nearby Habitat	Microphone Direction
12.4.18–17.4.18	A1	Hedgerow along improved grassland	South-east
	A2	In fence along wet ditch with improved grassland to the north	North-west

Dates	Position	Adjacent/Nearby Habitat	Microphone Direction
	A3	In fence under mature oak tree south of hedgerow with improved grassland surrounding	South-west
13.6.18–18.6.18	A1	On fence adjacent to hedgerow adjacent to improved grassland	North-north-east
	A2	On fence along hedgerow and wet ditch, adjacent to semi-improved grassland	West-south-west
	A3	Next to mature oak tree and hedgerow, adjacent to improved grassland	West-south-west
8.8.18–13.8.18	A1	In hedgerow with microphone attached to dead tree, adjacent to improved grassland	West
	A2	In hedgerow adjacent to wet ditch and improved grassland	North
	A3	Under large oak tree adjacent to hedgerow and improved grassland	South-west
27.5.21–1.6.21	A5	In tree in hedgerow surrounded by semi-improved grassland	North-west
	A6	Near large oak tree in hedgerow adjacent to improved grassland	West
8.7.21–12.7.21	A5	In hedgerow adjacent to improved grassland	West
	A6	Under large oak tree on fence adjacent to hedgerow and improved grassland	South
12.8.21–16.8.21	A5	In hedgerow near lighting hit tree, adjacent to improved grassland	South-west
	A6	In hedgerow adjacent to improved grassland	North-east

A5.23 The echolocation calls recorded by the detectors were filtered for noise files (i.e. sound files created when background noise triggers the detector to record) and then specifically for each of the UK's bat species using the Analook software filter function. The parameters for the noise filter are based on those proposed by Chris Corben and Kim Livengood[17] and are provided in **Table EDP A5.4**. All files passing the various filters were checked manually using sonogram analysis (AnalookW) in accordance with published parameters[18] to confirm the species identification of each bat call.

Table EDP A5.4: Filtration Values used by AnalookW Software to Remove Noise Files.

Filter	Smoothness	Frequency (Fc (kHz))		Duration (ms)	
		Min	Max	Min	Max
Noise filter	50	15	120	2	50

Limitations

A5.24 The identification of calls and species using Analook software is dependent upon the quality of the recording made, which can be influenced by the following factors, which may limit levels of activity and species recorded:

- Weather conditions – rainfall and wind;

[17] Taken from Making an Antinoise Filter presentation from 2010 Annual Bat Conference
[18] Russ (2012). *British Bat Calls, a guide to species identification*. Pelagic Publishing, Exeter

- Distance of bat from Anabat;
- Presence of obstructions through which the noise must pass i.e. trees; and
- Proximity of other noise sources such as roads.

A5.25 There was occasional rain/drizzle on two nights during the 2018 surveys, and no rain during the 2021 surveys. Although the overnight temperatures dropped by morning, all but one of the automated surveys (12 April 2018) had temperatures of 10°C or above at sunset. Overall, the automated detector surveys completed during 2018 and 2021 were not considered to be constrained by unseasonably cold/wet conditions.

Results

Visual (Ground-level) Roost Assessment of Trees

A5.26 The daytime assessment of trees within the Site identified eight trees that have the potential to support roosting bats, including two trees with confirmed roosts, two trees with high potential, two trees with moderate/moderate-high potential and two trees with low/negligible-low potential. Details of these trees are set out in **Table EDP A5.5**, and their location can be seen on **Plan EDP 2**.

Table EDP A5.5: Bat Tree Roost Assessment Results.

Tree Reference	Tree Species	Bat Roost Potential	Bat Roost Features
T17	Ash	M-H	Woodpecker holes, rot holes and a dead crown.
T18	Crack willow	H	Tear outs, splits and a hollow trunk.
T19	Crack willow	H	Woodpecker holes, rot holes, splits and a hollow trunk.
T20	Crack willow	L	Rot holes and a hollow trunk . Tree was originally assessed as having high potential, but has since fallen with many features lost, and now has only low potential.
T22	Willow sp.	L	Pollarded willow with rot holes and a hollow trunk.
T23	Willow sp.	M	Rot holes, splits and a hollow trunk.
T25	Willow sp.	L	Rot holes.
T30	Ash	H	Large hole in trunk with smaller crack also in truck

A5.27 No bats or evidence of bats were found during the ground level tree assessment, although individual presumed noctule bats were observed emerging from tree T18 and T30 during the activity transect survey in May 2021.

Bat Roost Assessment of Buildings

A5.28 There are six buildings within the Site, all of which were assessed as having negligible bat roosting potential. The building locations are shown on **Plan EDP 1** and are described in detail below (see also **Images EDP A5.1** and **A5.2**).

A5.29 The buildings are constructed with metal frames, with corrugated metal and asbestos sheet roofing. The majority of buildings are open-sided on at least one side, but have corrugated sheet asbestos and metal, as well as wooden boarded walls where present. The buildings have a mixture of pitched roofs with skylights present, and domed roofs.

A5.30 All of the buildings were considered to have negligible potential to support roosting bats, and are in constant use as farm stores, and warehouses for both equipment, materials and animals. As such, no further surveys of these buildings were recommended.

Image EDP A5.1: Open-sided farm buildings used for cattle, looking west, with additional open-sided farm building in the background being used for storage of hay and farm machinery.

Image EDP A5.2: Open-sided farm building used for storage of hay, looking east.

Manual Transect Surveys

A5.31 The detailed results of the manual transect surveys are provided below, and the distribution of bat activity within the Site recorded during the transect surveys is illustrated on **Plans EDP 9** to **14**.

A5.32 During the surveys in 2018 a total of five species were recorded, with the vast majority of registrations recorded from common pipistrelle (*Pipistrellus pipistrellus*) bat, with fewer registrations recorded from noctule (*Nyctalus noctula*) and soprano pipistrelle (*Pipistrellus pygmaeus*) bats. Very low levels of activity were recorded from myotis (*Myotis* sp.) and serotine (*Eptesicus serotinus*) bats, with only individual registrations of long-eared (*Plecotus* sp.) bats recorded in August 2018.

A5.33 During the surveys in April, June and August 2018, no concentrations of bat activity were recorded within the Site. The total number of registrations recorded during each survey can be seen in **Table EDP A5.6**.

A5.34 During the surveys in 2021, a total of seven species were recorded, with the vast majority of registrations recorded from common pipistrelle and noctule bats, with fewer registrations recorded from soprano pipistrelle, serotine and *Myotis* sp. bats. Only an individual registration of Nathusius' pipistrelle (*Pipistrellus nathusii*) was recorded in May, and an individual registration of barbastelle (*Barbastella barbastellus*) was recorded in July. The majority of bat activity was recorded in July, with much less activity recorded in May and August.

A5.35 During the May 2021 survey, the majority of activity was recorded along wet ditch S2 and associated with woodlands W1 and W2 bordering the M40. During the July 2021 survey, the majority of bat activity was recorded along the southern boundary, along the A41. In August 2021, the majority of registrations were recorded in the south of the Site, with a small concentration along wet ditch S2. The total number of registrations recorded during each survey (both within the Site and the wider area) can be seen in **Table EDP A5.7**.

Table EDP A5.6: Transect Recordings 2018.

Bat Species	Number of Bat Passes Recorded per Night			Total
	18.4.18	18.6.18	19.8.18	
Common pipistrelle	18	121	34	**173**
Soprano pipistrelle	5	6	2	**13**
Nathusius' pipistrelle	1	0	0	**1**
Myotis sp.	4	2	1	**7**
Long-eared bat sp.	0	0	1	**1**
Serotine	0	3	0	**3**
Noctule	1	35	3	**39**
Total	**29**	**167**	**41**	**237**

Table EDP A5.7: Transect Recordings 2021.

Bat Species	Number of Bat Passes Recorded per Night			Total
	27.5.21	8.7.21	12.8.21	
Common pipistrelle	26	58	3	**87**
Soprano pipistrelle	11	10	1	**22**
Nathusius' pipistrelle	1	0	0	**1**
Myotis sp.	9	2	2	**13**
Long-eared bat sp.	0	4	0	**4**
Serotine	1	15	1	**17**
Noctule	2	82	4	**88**
Barbastelle	0	1	0	**1**
Total	**50**	**172**	**11**	**233**

A5.36 In summary, the levels of bat activity in 2018 and 2021 were generally the same, with the majority of activity recorded in June and July, and with the majority of registrations recorded from common pipistrelle, noctule and soprano pipistrelle.

A5.37 The abundance and diversity of bat species recorded on-site is generally considered to be typical of an urban fringe setting, with common and widespread generalist common pipistrelle accounting for the majority of foraging and commuting activity. The adjacent woodland and tree belt habitats are considered, in the context of the surroundings, to provide some suitable foraging habitats for a more diverse assemblage. Only an individual barbastelle, and Annex II species, was recorded during the transect surveys on one occasion, indicating that there is unlikely to be a roost nearby, and that this species is only using the Site for occasional foraging and commuting.

Automated Detector Surveys

A5.38 The results of the automated detector surveys are summarised below in **Tables EDP A5.8** to **A5.10** for 2018, and **Tables EDP 5.11** to **5.13** for 2021.

Table EDP A5.8: Automated Recordings per Night – April 2018.

Detector Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		12.4	13.4	14.4	15.4	16.4	17.4	
A1	Common pipistrelle	0	3	0	2	0	1	**6**
	Soprano pipistrelle	0	0	0	0	0	1	**1**
	Myotis sp.	0	2	0	2	1	0	**5**
	Long-eared bat sp.	0	0	0	1	0	0	**1**
	Serotine	0	0	0	0	0	0	**0**
	Noctule	0	1	0	0	0	3	**4**
	Barbastelle	0	0	0	0	0	0	**0**
	Total	**0**	**6**	**0**	**5**	**1**	**5**	**17**
A2	Common pipistrelle	0	22	4	29	96	116	**267**
	Soprano pipistrelle	0	28	6	19	7	163	**223**
	Myotis sp.	0	4	2	4	5	3	**18**
	Long-eared bat sp.	0	0	0	0	0	0	**0**
	Serotine	0	1	0	0	0	1	**2**
	Noctule	0	0	0	0	0	1	**10**
	Barbastelle	0	30	7	16	7	63	**123**
	Total	**0**	**85**	**19**	**68**	**115**	**347**	**634**
A3	Common pipistrelle	0	3	8	1	0	0	**12**
	Soprano pipistrelle	0	0	0	0	0	0	**0**
	Myotis sp.	0	6	6	1	0	0	**13**
	Long-eared bat sp.	2	4	0	0	0	0	**6**
	Serotine	0	1	1	0	0	0	**2**
	Noctule	0	0	0	0	0	0	**0**
	Barbastelle	1	1	0	0	0	0	**2**
	Total	**3**	**15**	**15**	**2**	**0**	**0**	**35**

Table EDP A5.9: Automated Recordings per Night – June 2018.

Detector Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		13.6	14.6	15.6	16.6	17.6	18.6	
A1	Common pipistrelle	64	23	17	18	29	2	**153**
	Soprano pipistrelle	5	2	1	1	1	1	**11**
	Myotis sp.	10	8	6	2	1	2	**29**
	Long-eared bat sp.	1	0	0	0	0	0	**1**
	Serotine	5	2	1	1	2	1	**12**
	Noctule	4	10	4	5	21	10	**54**
	Barbastelle	0	0	0	1	0	0	**1**
	Total	**89**	**45**	**29**	**28**	**54**	**16**	**261**
A2	Common pipistrelle	338	103	89	133	102	44	**809**
	Soprano pipistrelle	41	5	11	16	42	2	**117**
	Myotis sp.	6	11	13	8	10	4	**52**
	Long-eared bat sp.	0	0	0	0	0	1	**1**

Detector Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		13.6	14.6	15.6	16.6	17.6	18.6	
	Serotine	1	1	0	2	4	3	**11**
	Noctule	4	2	2	2	83	25	**118**
	Barbastelle	1	1	0	3	0	1	**6**
	Total	**391**	**123**	**115**	**164**	**241**	**80**	**1114**
A3	Common pipistrelle	19	460	156	90	437	152	**1314**
	Soprano pipistrelle	20	2	0	7	3	2	**34**
	Myotis sp.	3	4	2	2	0	0	**11**
	Long-eared bat sp.	0	0	0	0	0	0	**0**
	Serotine	0	0	1	0	1	0	**2**
	Noctule	3	2	5	2	5	14	**31**
	Barbastelle	0	0	0	0	0	0	**0**
	Total	**45**	**468**	**164**	**101**	**446**	**168**	**1392**

Table EDP A5.10: Automated Recordings per Night – August 2018.

Detector Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		8.8	9.8	10.8	11.8	12.8	13.8	
A1	Common pipistrelle	49	28	7	22	14	31	**151**
	Soprano pipistrelle	2	1	1	0	1	1	**6**
	Myotis sp.	1	2	0	4	0	0	**7**
	Long-eared bat sp.	0	0	0	0	0	0	**0**
	Serotine	2	5	0	0	0	0	**7**
	Noctule	21	25	5	14	7	2	**74**
	Barbastelle	0	2	0	4	3	0	**9**
	Total	**75**	**63**	**13**	**44**	**25**	**34**	**254**
A2	Common pipistrelle	2	0	3	0	0	0	**5**
	Soprano pipistrelle	0	0	0	4	1	0	**5**
	Myotis sp.	0	0	0	0	0	0	**0**
	Long-eared bat sp.	0	0	0	0	0	0	**0**
	Serotine	0	0	0	0	0	0	**0**
	Noctule	0	0	0	1	5	0	**6**
	Barbastelle	0	0	0	0	0	0	**0**
	Total	**2**	**0**	**3**	**5**	**6**	**0**	**16**
A3	Common pipistrelle	11	21	7	1	0	0	**40**
	Soprano pipistrelle	7	0	0	0	0	0	**7**
	Myotis sp.	0	1	1	0	1	0	**3**
	Long-eared bat sp.	0	2	0	0	1	0	**3**
	Serotine	0	0	1	1	0	0	**2**
	Noctule	2	3	0	0	1	0	**6**
	Barbastelle	1	4	0	0	0	0	**5**
	Total	**21**	**31**	**9**	**2**	**3**	**0**	**66**

Table EDP A5.11: Automated Recordings per Night – May 2021.

Detector Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		27.5	28.5	29.5	30.5	31.5	1.6	
A5	Common pipistrelle	95	97	98	58	82	66	**496**
	Soprano pipistrelle	55	101	48	22	16	23	**265**

Detector Position	Bat Species	Number of Bat Passes Recorded per Night						Total
		27.5	28.5	29.5	30.5	31.5	1.6	
	Myotis sp.	2	5	12	6	11	11	**47**
	Long-eared bat sp.	0	0	0	0	0	0	**0**
	Serotine	0	0	1	2	1	1	**5**
	Noctule	19	37	40	11	23	20	**150**
	Barbastelle	0	0	0	0	0	3	**3**
	Total	**171**	**240**	**199**	**99**	**133**	**124**	**966**
A6	Common pipistrelle	66	85	88	66	46	79	**430**
	Soprano pipistrelle	11	10	18	2	3	3	**47**
	Myotis sp.	5	9	5	17	9	8	**53**
	Long-eared bat sp.	0	0	0	4	2	1	**7**
	Serotine	0	4	34	14	4	0	**56**
	Noctule	6	23	11	10	12	17	**79**
	Barbastelle	0	0	0	4	0	0	**4**
	Total	**88**	**131**	**156**	**117**	**76**	**108**	**676**

Table EDP A5.12: Automated Recordings per Night – July 2021.

Detector Position	Bat Species	Number of Bat Passes Recorded per Night					Total
		8.7	9.7	10.7	11.7	12.7	
A5	Common pipistrelle	40	151	97	121	9	**418**
	Soprano pipistrelle	10	121	10	41	6	**188**
	Myotis sp.	3	5	7	4	0	**19**
	Long-eared bat sp.	0	0	0	0	0	**0**
	Serotine	0	0	0	1	0	**1**
	Noctule	6	37	31	11	3	**88**
	Barbastelle	0	0	4	0	0	**4**
	Total	**59**	**314**	**149**	**178**	**18**	**718**
A6	Common pipistrelle	13	29	25	82	392	**541**
	Soprano pipistrelle	26	29	51	63	70	**239**
	Myotis sp.	4	1	3	6	8	**22**
	Long-eared bat sp.	0	0	2	0	1	**3**
	Serotine	0	0	0	0	0	**0**
	Noctule	33	39	13	13	27	**125**
	Barbastelle	0	0	0	4	2	**6**
	Total	**76**	**98**	**94**	**168**	**500**	**936**

Table EDP A5.13: Automated Recordings per Night – August 2021.

Detector Position	Bat Species	Number of Bat Passes Recorded per Night					Total
		12.8	13.8	14.8	15.8	16.8	
A5	Common pipistrelle	29	79	125	37	18	**288**
	Soprano pipistrelle	49	80	96	70	15	**310**
	Myotis sp.	4	19	26	10	9	**68**
	Long-eared bat sp.	0	0	0	1	0	**1**
	Serotine	0	1	2	0	0	**3**
	Noctule	5	27	35	49	29	**145**
	Barbastelle	0	0	0	0	0	**0**
	Total	**87**	**206**	**284**	**167**	**71**	**815**
A6	Common pipistrelle	14	111	57	50	87	**319**

Detector Position	Bat Species	Number of Bat Passes Recorded per Night					Total
		12.8	13.8	14.8	15.8	16.8	
	Soprano pipistrelle	4	15	29	27	26	**101**
	Myotis sp.	1	5	5	7	8	**26**
	Long-eared bat sp.	0	0	1	2	1	**4**
	Serotine	0	1	0	3	1	**5**
	Noctule	17	14	8	29	6	**74**
	Barbastelle	0	0	0	0	0	**0**
	Total	**36**	**146**	**100**	**118**	**129**	**529**

A5.39 To summarise, in 2018 activity levels were significantly higher in June than in April or August, though activity levels overall were low. In 2021, there were less pronounced differences in activity levels between months, which is likely to be a result of these falling more within the core bat activity period. The Anabat location with the highest total number of bat registrations overall was Location 2 (**Plan EDP 9**), which was positioned in the west of the Site near the wet ditch and woodland, both suitable habitats for foraging/commuting bats.

A5.40 Overall, the majority of registrations recorded relate to common and widespread bat species, in particular common pipistrelle and soprano pipistrelle. Most other species made up a very small proportion of the total registrations recorded, although there were slightly higher numbers of registrations of noctule, a widespread but less abundant species. Of note is the presence of the rarer barbastelle, an Annex II species. Generally, only very low levels of barbastelle activity were recorded in 2018 and 2021, with single digit numbers of registrations recorded on a small number of survey days. although a larger number of registrations was recorded at one location during April 2018.

Evaluation of Overall Assemblage

A5.41 The abundance and diversity of bat species recorded during the course of manual transect and automated detector surveys is considered to be relatively typical of an urban edge farmland site in southern England, with common and widespread generalist species such as common pipistrelle and soprano pipistrelle species accounting for the vast majority of foraging and commuting activity. The wet ditch corridor with associated woodland, trees and scrub provides a valuable foraging resource for the local bat population, and across the wider Site the hedgerows and scrub are considered to provide some suitable foraging opportunities. The majority of the on-site habitats are considered typical of the wider surroundings and based on their quality/extent, only capable of supporting moderate numbers of bats.

A5.42 Based on the findings summarised above, the bat population present within the Site is considered to be of Local-level ecological importance.

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Annex EDP 6
Otter and Water Vole Survey

Methodology

A6.1 The Site supports habitats considered suitable to support otter or water vole, with wet ditches running through the Site.

A6.2 An initial walkover survey was undertaken by an experienced surveyor on 12 April 2018, with detailed surveys carried out on 14 June 2018, which was updated on 28 May 2021 and 8 July 2021, which were conducted with reference to best practice guidelines for otter[19] and water vole[20]. All signs of otter and water vole activity were searched for, including:

- Faeces/latrines (maintained or disused latrines and individual droppings);
- Burrow entrances;
- Feeding signs (including feeding stations and grazed lawns);
- Footprints; and
- Possible runs.

Results

A6.3 The surveys recorded no definitive signs of water vole presence within any of the habitats surveyed.

A6.4 During the survey on 14 June 2018, S1 was noted as holding water but being heavily choked with vegetation, and S2 was noted as being mostly dry and heavily overshaded. A dry and fragmented otter spraint was recorded at the junction of S1 and S2, the location of which can be seen on **Plan EDP 2**.

A6.5 On the 28 May 2021, a number of sections of the wet ditches within the Site were noted as having been recently cleared and scraped, with little or no bankside or aquatic vegetation present. No evidence of otter or water vole was recorded during this survey.

[19] Chartered Institute of Ecology and Environmental Management and The Mammal Society (2013). Technical Guidance Series, Competencies for Species Survey: Eurasian Otter.

[20] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook (The Mammal Society Mitigation Guidance Series).

A6.6 During the survey on 08 July 2021 the ditches were recorded as being very shallow to dry, and with very little bankside or aquatic vegetation. No evidence of otter or water vole were recorded during this survey.

Annex EDP 7
Badger Survey (Confidential)

Methodology

A7.1 Detailed badger walkover surveys were undertaken to determine the presence/absence and distribution of badgers within the Site. The surveys were completed on 12 April 2018, 22 November 2018, 22 February 2021 and 05 August 2021 by suitably experienced ecologists.

A7.2 During the surveys, any signs of badger activity were recorded, including the following:

(i) Setts, the number of entrances and any evidence of current use;

(ii) Tracks that are confirmed as badger pathways (i.e. there is a clear link to a sett or there is additional evidence of badger activity nearby such as latrines, hairs, footprints or feeding signs); and

(iii) The presence of discarded bedding, hairs, footprints, latrines and feeding signs.

Limitations

A7.3 Given that badgers are mobile animals with dynamic populations it is possible that new badger setts could arise in the future. Furthermore, access to some areas of the semi-natural woodland habitat of W2 bordering the western boundary of the Site was limited given the presence of the M40 adjacent to this woodland, and so setts may have gone unnoticed in that area, although it is noted that no obvious pathways in/out of the woodland or areas of dense understorey were observed.

Results

A7.4 A dead badger was recorded within the Site itself, recorded during a reptile survey carried out in July 2018. No other evidence of badgers was recorded within the Site itself, although badger setts are known from the wider area.

A7.5 The results of the badger surveys can be seen on **Plan EDP 2**.

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Appendix EDP 8
Great Crested Newt Survey

Methodology

A8.1 There are no ponds within the Site but four lie within 500m of the Site boundary, P1–P4 (see **Plan EDP 2**).

A8.2 Due to the intensive agricultural management of the land within the Site, the grassland fields are not considered suitable for commuting or foraging newts. A full description of pond P1 is provided in **Annex EDP 1** of this report, with descriptions of P2–P4 set out below.

A8.3 Pond P2 has shallow, sloping sides with a steep bank on the western side. The pond is surrounded by amenity grassland and grazed fields, and there are fish present within this pond. Iris (*Iris* sp.), rushes and sedges are present within the water, with alder (*Alnus glutinosa*) and common nettle around the margins. Duckweed is also present covering the water.

A8.4 Pond P3 is a medium sized garden pond that has a wet ditch flowing into it. The pond is surrounded by amenity grassland and buildings and there are ornamental shrubs and grasses at the margins, with willow trees also present.

A8.5 Pond P4 is a medium sized pond that lies within a grazed grassland field. There are small stands of scrub present at the margins, and a line of trees along the eastern edge, with a stand of iris present in the water.

A8.6 Three standard surveys were carried out on ponds P1–P4 in 2018, which were carried out on 19 April 2018, 23 April 2018 and 26 April 2018 by a Natural England great crested newt survey licence holder and an assistant. Surveys were undertaken with reference to the survey methodology set out in the English Nature Guidelines[21] In accordance with the guidelines, the following three preferred survey techniques were employed to determine the presence/likely absence of great crested newts within those ponds surveyed:

- Torching: This involves searching water bodies by torchlight between dusk and midnight and is an effective means of detecting adult newts. Each surveyor used a 1,000,000 candle power torch during this part of the survey;

- Bottle Trapping: This involves the use of funnel traps (made from two-litre plastic bottles) that are inserted into the water along the margin of the water bodies during the evening and checked the following morning. Access permitting, the traps are spaced at roughly 2m intervals around the margins of the ponds; and

[21] English Nature (2001). Great Crested Newt Mitigation Guidelines, Version: August 2001. Peterborough.

- Egg Searching: A search of any suitable aquatic vegetation to check for great crested newt eggs.

A8.7 The weather conditions at the time of the survey are summarised in **Table EDP A8.1**.

Table EDP A8.1: Dates, Timings and Conditions for the Great Crested Newt Surveys.

Visit	Date (evening)	Time	Air temp. (°C)	Cloud cover (%)	Wind	Rain
1	19.4.18	18:00	26	0	Still	Nil
2	23.4.18	17:30	12	100	Light breeze	Nil
3	26.4.18	17:30	12	0	Light breeze	Nil

Environmental DNA Sampling

A8.8 Water sampling was undertaken of ponds P1–P4 on 24 April 2018, in combination with the above surveys, to determine the presence/likely absence of great crested newt using environmental DNA (eDNA). An updated water sampling survey was undertaken of ponds P1–P4 on 12 May 2021.

A8.9 eDNA is DNA that is collected from the environment in which an organism lives. In aquatic environments, animals including amphibians shed cellular material into the water via their saliva, urine, faeces, skin cells, etc. This DNA may persist for several weeks, and can be collected through a water sample, and analysed to determine if the target species of interest (great crested newt) is/has been present in the waterbody.

A8.10 Water samples were taken by a Natural England great crested newt licensed ecologist and an assistant, in accordance with the methodologies set out by the Freshwater Habitats Trust[22] and using separate sterile equipment packs for the collection of eDNA samples. Briefly, the protocol involved:

- Collecting 20 water samples from selected areas evenly spread around the accessible perimeter of the waterbody including, both open water and vegetated areas;

- At each sampling location, a ladle of water was collected by stirring the water column without stirring up sediment and poured into the provided sampling bag. When all 20 ladles were collected, the bag was shaken thoroughly;

- 15ml of this mixed sample was then pipetted into each of six conical tubes containing preserving fluid and each tube was shaken thoroughly to homogenise the sample. There are six tubes per waterbody; and

[22] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. *Analytical and methodological development for improved surveillance of the Great Crested Newt*. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford

- These tubes were then labelled appropriately and couriered to the laboratory for real-time polymerase chain reaction (PCR) analysis as detailed within Biggs *et al.* (2014).

Results

Presence/Absence Surveys

A8.11 No great crested newts were recorded using any of the three traditional methods used during the 2018 surveys within any of the ponds surveyed. Low populations of smooth newts (*Lissotriton vulgaris*) were recorded within ponds P1, P2 and P4, with smooth newt eggs recorded within P4. Common frog (*Rana temporaria*) adults and/or tadpoles recorded in ponds P2, P3 and P4 and toad (*Bufo bufo*) recorded within ponds P2. During the reptile surveys carried out in 2018 and 2021, common toad were also recorded within the Site.

A8.12 During the surveys, fish were recorded within P2, P3 and P4.

A8.13 In addition, no evidence of great crested newt eDNA was found in either the waterbodies surveyed in 2018 or 2021, confirming the likely absence of the species. Analysis was conducted in accordance with current best practice guidelines[23], and in the presence of the following controls: extraction blank, appropriate positive and negative PCR controls (great crested newt, inhibition, and degradation). All controls performed as expected. A summary of the results is provided in **Table EDP A8.2**.

Table EDP A8.2: Summary of eDNA Results

Pond/Ditch No.	Survey Year	Inhibition	Degradation	GCN Detection
P1	2018	Pass	Pass	Negative
	2021	Pass	Pass	Negative
P2	2018	Pass	Pass	Negative
	2021	Pass	Pass	Negative
P3	2018	Pass	Pass	Negative
	2021	Pass	Pass	Negative
P4	2018	Pass	Pass	Negative
	2021	Pass	Pass	Negative

[23] Biggs J, Ewald N, Valentini A, Gaboriaud C, Griffiths RA, Foster J, Wilkinson J, Arnett A, Williams P and Dunn F 2014. Analytical and methodological development for improved surveillance of the Great Crested Newt. Appendix 5. Technical advice note for field and laboratory sampling of great crested newt (*Triturus cristatus*) environmental DNA. Freshwater Habitats Trust, Oxford

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Appendix EDP 9
Reptile Survey

Methodology

A9.1 The Site is largely unsuitable to support widespread reptiles owing to the occurrence of intensive agricultural management, which results in frequent disturbance to, and loss of, suitable reptile habitat. However, the field margins and areas of tall ruderal vegetation habitats were considered suitable to support basking, foraging and dispersing reptiles.

A9.2 Therefore, to confirm the presence or likely absence of reptiles and the extent of their usage of the Site, detailed refugia-based surveys were undertaken with reference to best practice guidance[24, 25]. The surveys took place in 2018 with seven survey visits undertaken between May and September inclusive. Surveys were updated in 2021 and were carried out between May and August 2021.

A9.3 During 2018 a total of 31 artificial refugia, comprising bitumen undertile felt cut to approximately 1m x 0.5m, were deployed within suitable reptile habitat across the Site on 18 April 2018. In 2021, 90 artificial refugia were deployed on 07 May 2021. The approximate location of reptile refugia is illustrated on **Plan EDP 2**.

A9.4 Reptile refugia were left undisturbed *in situ* for a minimum period of 15 days prior to the commencement of reptile surveys in both 2018 and 2021. Detailed weather conditions recorded during each survey visit undertaken are summarised in **Table EDP A9.1** and **Table EDP A9.2**.

Table EDP A9.1: Date, Timing and Weather Conditions of Reptile Surveys Undertaken during 2018

Visit No.	Date	Start-Finish Time	Air Temp (°C)	Wind Speed (Beaufort)	Cloud Cover (%)	Rain
1	9.5.18	10:00-11:30	14-15	3	80	Nil
2	14.6.18	15:00-16:30	17-18	2-4	40-60	Nil
3	19.6.18	09:30-11:00	17-19	0-1	10-20	Nil
4	27.7.18	08:20-09:45	18-22	1-3	30-80	Nil
5	31.7.18	09:15-10:40	15-18	2-4	30-70	Nil
6	13.8.18	17:00-18:00	15-16	0-2	20-30	Nil
7	10.9.18	11:45-13:30	17-19	2-3	60-80	Nil

[24] Froglife (1999) *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10*, Froglife, Halesworth

[25] DMRB (2005) *Nature conservation advice in relation to reptiles and roads. Volume 10, Section 4, Part 7, HA/116/05.* DMRB

Table EDP A9.2: Date, Timing and Weather Conditions of Reptile Surveys Undertaken during 2021

Visit No.	Date	Start-Finish Time	Air Temp (°C)	Wind Speed (Beaufort)	Cloud Cover (%)	Rain
1	25.5.21	09:30-10:45	12-14	2-3	70-80	Nil
2	9.6.21	09:00-10:45	16-19	1-3	10-30	Nil
3	22.6.21	09:40-11:15	13-14	2-3	40-80	Nil
4	30.6.21	10:40-13:00	15-17	1	100	Nil
5	13.7.21	10:40-13:00	16-17	1-2	80	Nil
6	20.7.21	17:20-19:30	17-18	0-1	10-50	Nil
7	5.8.21	12:00-14:30	16-19	3	50-95	Occasional showers

A9.5 During each survey visit, artificial refugia were individually checked by an experienced ecologist with any reptiles observed recorded, along with notes on their life stage (adult/juvenile) and sex.

A9.6 The peak survey count (maximum number of adults recorded during any one survey visit) was then used to estimate approximate population size for each reptile species recorded. Estimates of population size followed the approach given in the withdrawn draft reptile mitigation guidelines[26]; and are summarised with respect to widespread reptiles in **Table EDP A9.3**.

Table EDP A9.3: Population Size Class Estimates/

Species	Population Size Class Category		
	Small	Medium	Large
Slow-worm	< 10	10-40	> 40
Common lizard	< 5	5-20	> 20
Grass snake	< 5	5-10	> 10
Adder	< 5	5-10	> 10

Limitations

A9.7 Reptile surveys undertaken within the Site were completed within recognised optimal months for detecting reptiles and, largely, during suitable weather conditions. However, during the survey visit 4 in 2018 the temperature did rise above 20ºC, while occasional showers were recorded during survey visit 7 in 2021, as detailed in in **Tables EDP A9.1** and **A9.2**.

A9.8 No reptiles were recorded during any of the surveys in 2018, while reptiles were still found on three out of seven survey visits in 2021, therefore the weather conditions are not considered to have significantly affected the survey findings.

[26] Natural England (2011) *Natural England Technical Information Note TIN102 Reptile Mitigation Guidelines.* WITHDRAWN

Results

A9.9 No reptiles were found within the Site during the surveys in 2018.

A9.10 Updated reptile surveys undertaken in 2021 confirmed the presence of grass snake within the Site. Full details of the number of individuals and peak adult survey count are given in **Table EDP A9.4**.

Table EDP A9.4: Number and Peak Adult Survey Count of Reptiles Recorded in 2021

Visit	Visit Date	Reptiles within the Application Site	
		Grass Snake	
		Adult	Juvenile
1	25.5.21	-	1
2	9.6.21	-	-
3	22.6.21	-	-
4	30.6.21	-	1
5	13.7.21	-	-
6	20.7.21	1	1
7	5.8.21	-	-
Peak Adult Survey Count:		**1**	
Population Size Class Estimate:		**Small**	

A9.11 A single adult and a maximum of one juvenile grass snake were recorded within the Site, considered to come from one population. The grass snakes were recorded along the western boundary associated with pond P1 and in the tall ruderal vegetation bund in the east of the Site, north of the buildings (see **Plan EDP 2**).

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Appendix EDP 10
Butterfly Surveys

Methodology

A10.1 The presence of blackthorn (*Prunus spinosa*) and elm (*Ulmus* sp.) within the on-site hedgerows provides potential for the Site to support a range of notable Lepidoptera namely, brown, black and white-letter hairstreak.

A10.2 To confirm the presence, or likely absence, of hairstreak butterflies from the Site an egg search was completed on 22 November 2018 and updated on 22 February 2021. During the survey all blackthorn and elm was searched by hand to identify eggs laid on the branches.

White-letter Hairstreak

A10.3 White-letter hairstreak butterflies lay their eggs on elm trees and as such the survey covered all of the elm present within the hedgerow network. The surveyor walked to southern or eastern side of each hedgerow, pulling down the more robust growth at the top of the hedgerow and inspecting the branch for eggs.

A10.4 The white-letter eggs are typically located on:

- The underside of the girdle scar, where the most recent growth meets the older wood (often on older side-shoots rather than the leading stem);
- At the base of side shoots;
- On old leaf scars; and/or
- At the base of buds.

Brown and Black Hairstreak

A10.5 Both brown and black hairstreak butterflies target blackthorn to lay their eggs on, however, brown hairstreak females typically have a preference for laying on the young suckers and new growth on lower branches while black hairstreak eggs are more often found on the broader stems near the top of the hedgerows and also on growth located deeper into the hedge.

A10.6 As with the white-letter surveys, the Surveyor targeted the sunnier southern or eastern sides of the hedgerow, searching the new young growth and suckers as well as pulling down the more mature growth at the top of the hedgerow.

Limitations

A10.7 The hedgerows within the Site are subject to a cycle of flailing, which strips the young growth off the hedgerows in winter thereby removing the habitat and destroying the eggs. During the 2021 survey, a number of hedgerows were noted to have been flailed in recent weeks prior to the survey. The survey in February 2021 was conducted following the annual flail, and as hairstreak eggs were recorded, this survey is still considered to be valid.

A10.8 Not all egg-laying habitat is accessible using the survey methods employed, such that the absence of recorded eggs is not definitive evidence of the absence of these species.

Results

A10.9 During the 2018 survey, with brown hairstreak butterfly eggs were identified within five of the hedgerows, namely hedgerows H10 and the tree belt south of H9 within the Site(see **Plan EDP 2**) with six eggs found in total.

A10.10 During the 2021 update survey, brown hairstreak eggs were identified within hedgerow H7 within the Site with two eggs found in total (see **Plan EDP 2**). In addition, black hairstreak eggs were found in hedgerow H6 within the Site, with a total of two eggs found (see **Plan EDP 2**).

A10.11 No white-letter hairstreak eggs were recorded during the surveys in 2018 or in 2021. The presence of a small population of this species within the Site cannot be entirely ruled out, however.

Plans

Plan EDP 1	Extended Phase 1 Habitat Survey (edp2425_d036c 24 November 2021 GY/TW)
Plan EDP 2	Protected Species Plan (edp2425_d027c 24 November 2021 GY/TW)
Plan EDP 3	Designated Sites (edp2425_d021a 24 November 2021 GY/TW)
Plan EDP 4	Pilot Winter Bird Survey – November 2018 (edp2425_d022b 23 November 2021 GY/TW)
Plan EDP 5	Breeding Bird Survey – April 2018 (edp2425_d023b 23 November 2021 GY/TW)
Plan EDP 6	Breeding Bird Survey – May 2018 (edp2425_d024b 23 November 2021 GY/TW)
Plan EDP 7	Breeding Bird Survey – June 2018 (edp2425_d025b 23 November 2021 GY/TW)
Plan EDP 8	Breeding Bird Survey – April 2021 (edp2425_d026b 23 November 2021 GY/TW)
Plan EDP 9	Bat Activity Survey – April 2018 (edp2425_d029b 24 November 2021 GY/TW)
Plan EDP 10	Bat Activity Survey – June 2018 (edp2425_d030b 24 November 2021 GY/TW)
Plan EDP 11	Bat Activity Survey – August 2018 (edp2425_d031b 24 November 2021 GY/TW)
Plan EDP 12	Bat Activity Survey – May 2021 (edp2425_d032b 24 November 2021 GY/TW)
Plan EDP 13	Bat Activity Survey – July 2021 (edp2425_d033b 24 November 2021 GY/TW)
Plan EDP 14	Bat Activity Survey – August 2021 (edp2425_d034b 24 November 2021 GY/TW)

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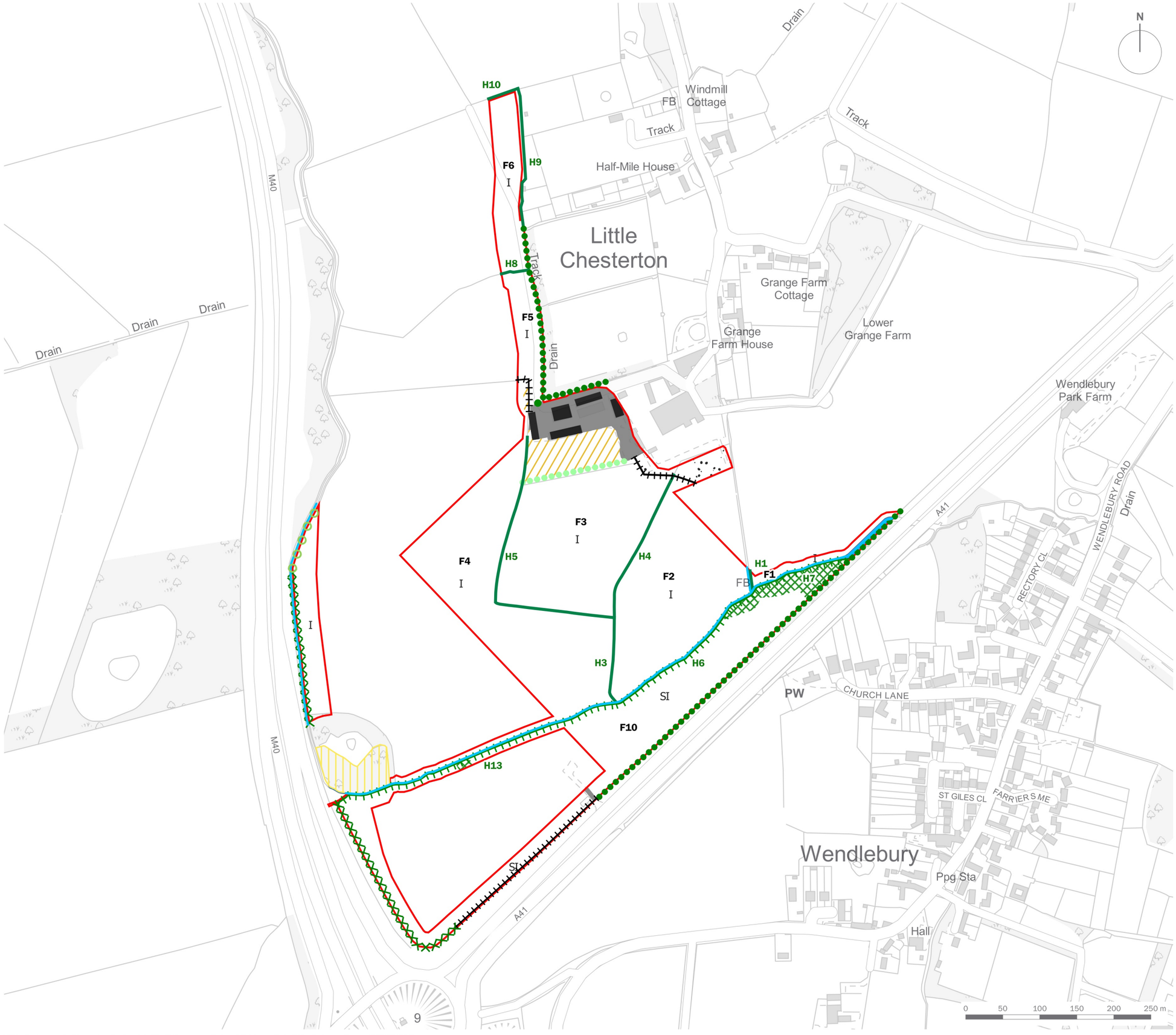

Site Boundary

Ancient Semi-natural Woodland

Tall Ruderal

Dense Continuous Scrub

I Improved Grassland

SI Poor Semi-improved Grassland

Running Water/Stream

Building

Hardstanding

Bare Ground

Intact Species-poor Hedgerow and Trees

Intact Species-poor Hedgerow

Scattered Trees/Parkland (Broadleaved)

Woodland Edge

Scattered Trees/Parkland (Coniferous)

Scattered Scrub

Wet Ditch

Fence

Scattered Trees (Broadleaved)

client
Tritax Symmetry Ltd and Siemens Healthineers

project title
Symmetry Park, North Oxford

drawing title
Plan EDP 1: Extended Phase 1 Survey

date	**24 NOVEMBER 2021**	drawn by	**DJ**
drawing number	**edp2425_d036c**	checked	**JM**
scale	**1:5,000 @ A3**	QA	**RB**

the environmental dimension partnership

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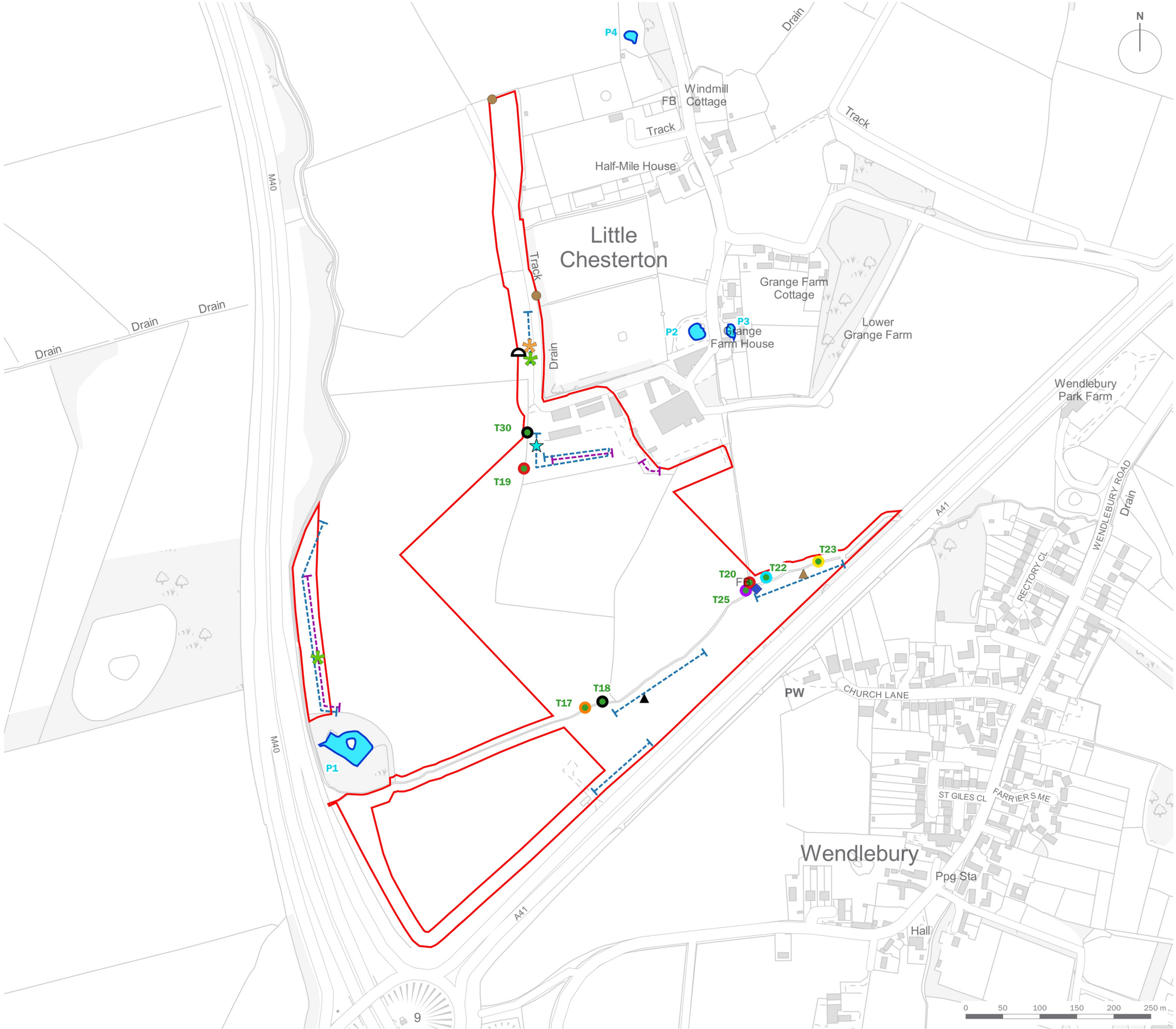

Site Boundary

Barn Owl Sighting

Bat Tree Roost Assessment

- Tree with Confirmed Bat Roost
- Tree with High Bat Roost Potential
- Tree with Moderate to High Bat Roost Potential
- Tree with Moderate Bat Roost Potential
- Tree with Low Bat Roost Potential
- Tree with Negligible to Low Bat Roost Potential

Otter

- Otter Spraint (2018)

Great Crested Newt

- Negative eDNA

Reptiles

- Reptile Refugia (2018)
- Reptile Refugia (2021)
- Adult Grass Snake
- Juvenile Grass Snake

Hairstreak Butterflies

- Black Hairstreak Eggs (2021)
- Brown Hairstreak Eggs (2021)
- Brown Hairstreak Eggs (2018)

Badger

- Dead Badger (Adult)

client
Tritax Symmetry Ltd and Siemens Healthineers

project title
Symmetry Park, North Oxford

drawing title
Plan EDP 2: Protected Species Plan

date	**23 NOVEMBER 2021**	drawn by	**DJ**
drawing number	**edp2425_d027c**	checked	**JM**
scale	**1:5,000 @ A3**	QA	**RB**

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