

Water Eaton

PR6a : Land East of Oxford Road

Ecology Baseline

Bellway


**STRATEGIC
LAND**



CHRIST CHURCH
UNIVERSITY OF OXFORD

WE/ECO/P 02



Water Eaton

Technical Appendix 9.1 Ecology Baseline

Prepared by:
**The Environmental
Dimension Partnership
Ltd**

On behalf of:
**Bellway Homes Limited
and Christ Church,
Oxford**

February 2024
Report Reference
edp5650_r007i

Contents

Executive Summary

Section 1	Introduction, Purpose and Context.....	1
Section 2	Methodology (Baseline Investigations)	3
Section 3	Results (Baseline Conditions).....	11
Section 4	Summary and Conclusions	23

Annexes

Annex EDP 1	Habitat Descriptions and Site Photographs
Annex EDP 2	Hedgerow Assessment
Annex EDP 3	Bird Surveys
Annex EDP 4	Bat Surveys
Annex EDP 5	Reptile Surveys
Annex EDP 6	Great Crested Newt Surveys
Annex EDP 7	Badger Surveys
Annex EDP 8	Brown Hairstreak Butterfly Surveys

Plans

Plan EDP 1	Extended Phase 1 Habitat Survey (edp5650_d037d 03 November 2023 GYo/OHo)
Plan EDP 2	Statutory Designated Sites (edp5650_d038a 07 December 2022 GYo/OHo)
Plan EDP 3	Non-statutory Designated Sites (edp5650_d039a 07 December 2022 GYo/OHo)
Plan EDP 4	Transect Routes and Static Detector Locations (edp5650_d040a 07 December 2022 GYo/OHo)

Plan EDP 5	Reptile Refugia Locations (edp5650_d041a 07 December 2022 GYo/OHo)
Plan EDP 6	Pond Locations (edp5650_d043b 03 February 2023 GYo/OHo)
Plan EDP 7	Winter Bird Survey February 2017 (edp5650_d045a 07 December 2022 GYo/OHo)
Plan EDP 8	Winter Bird Survey February 2021 (edp5650_d046a 07 December 2022 GYo/OHo)
Plan EDP 9	Breeding Bird Survey 2017 (edp5650_d047a 07 December 2022 GYo/OHo)
Plan EDP 10	Breeding Bird Survey 2021 (edp5650_d048a 07 December 2022 GYo/OHo)
Plan EDP 11	Breeding Bird Survey 2022 (edp5650_d049a 07 December 2022 GYo/OHo)
Plan EDP 12	Bat Activity Survey April 2017 Dusk (edp5650_d050a 07 December 2022 GYo/OHo)
Plan EDP 13	Bat Activity Survey May 2017 Dusk (edp5650_d051a 07 December 2022 GY/OHo)
Plan EDP 14	Bat Activity Survey June 2017 Dusk (edp5650_d052a 07 December 2022 GYo/OHo)
Plan EDP 15	Bat Activity Survey July 2017 Dusk (edp5650_d053a 07 December 2022 GYo/OHo)
Plan EDP 16	Bat Activity Survey July 2017 Dawn (edp5650_d054a 07 December 2022 GY/OH)
Plan EDP 17	Bat Activity Survey August 2017 Dusk (edp5650_d055a 07 December 2022 GYo/OHo)
Plan EDP 18	Bat Activity Survey September 2017 Dusk (edp5650_d056a 07 December 2022 GYo/OHo)
Plan EDP 19	Bat Activity Survey May 2021 Dusk (edp5650_d057a 07 December 2022 GYo/OHo)
Plan EDP 20	Bat Activity Survey July 2021 Dusk (edp5650_d058a 07 December 2022 GYo/OHo)

- Plan EDP 21** Bat Activity Survey July 2021 Dawn
 (edp5650_d059a 07 December 2022 GYo/OHo)
- Plan EDP 22** Bat Activity Survey September 2021 Dusk
 (edp5650_d060a 07 December 2022 GYo/OHo)
- Plan EDP 23** Reptile Survey Results
 (edp5650_d042a 07 December 2022 GYo/OHo)
- Plan EDP 24** Brown Hairstreak Butterfly Survey Results
 (edp5650_d044a 07 December 2022 GYo/OHo)

This version is intended for electronic viewing only

	Report Ref: edp5650_r007			
	Author	Formatted	Peer Review	Proofed by/Date
007_DRAFT	OH	SC	WC	-
007a_DRAFT	OHo	VSk	-	-
007b_DRAFT	OHo	SCh	-	-
007c_DRAFT	OHo	MWI	-	-
007d_DRAFT	OHo	SCh	-	-
007e_DRAFT	OHo	SCh	-	-
007f	OHo	-	-	CRo 010223
007g	OHo	-	-	GGi 241123
007h	OHo	-	-	LLI 281123
007i	OHo	-	-	SCh 260224

Executive Summary

- S1 The Environmental Dimension Partnership Ltd (EDP) was commissioned by Bellway Homes Limited and Christ Church, Oxford (hereafter referred to as 'the Applicant') to undertake ecology surveys at Water Eaton, Oxford ('the Site').
- S2 No part of the Site is covered by any statutory designation of international or national significance. However, a single European Site, the Oxford Meadows Special Area of Conservation (SAC), is present within 1.5km of the Site, and 12 nationally significant designated sites, many of which form component parts of the Oxford Meadows SAC, within 5km of the Site.
- S3 No part of the Site is covered by any non-statutory designations, but eight Local Wildlife Sites (LWS), four potential Local Wildlife Sites (pLWS), four Sites of Local Importance for Nature Conservation (SLINC), one Berkshire, Buckinghamshire and Oxfordshire Wildlife Trust Reserve (BBOWTR) and one Woodland Trust Reserve (WTR) are located within 2km of the Site.
- S4 The vast majority of the Site is arable farmland and therefore, habitat that has less than Local value. The arable fields are enclosed by a narrow strip of broadleaved woodland and a network of native hedgerows with a number of associated mature trees that are of Site to Local ecological value.
- S5 The Site supports a locally significant assemblage of farmland birds within the arable fields, hedgerows, and scrub during the winter. During the breeding season these habitats support a number confirmed or probably breeding species of conservation concern that contribute to an assemblage of breeding birds that are of District level value.
- S6 The Site supports a bat population of Local level value that consists of common and widespread species. Foraging and commuting bats were primarily associated with the boundary hedgerow habitats while the buildings on site and its surroundings support five roosts.
- S7 The Site contains a partially active outlier badger (*Meles meles*) sett of Site level value, that likely forms part of a badger clan's territory.
- S8 The reptile surveys identified that the Site contains at least a small population of grass snake of Site level value only.
- S9 The great crested newt surveys showed that these species are highly likely to be absent from the Site.
- S10 The Site contains a non-significant breeding population of brown hairstreak butterflies of Local level value.

- S11 The Site contains habitats that are able to support the notable species hedgehog (*Erinaceus europaeus*), brown hare (*Lepus europaeus*) and polecat (*Mustela putorius*) for which records from the Thames Valley Environmental Records Centre were returned from within 2km of the Site. Brown hare have also been recorded within the Site during breeding bird surveys.

Section 1 Introduction, Purpose and Context

- 1.1 This Ecological Appraisal has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of Bellway Homes Limited and Christ Church, Oxford (hereafter referred to as 'the Applicant'). This report details the baseline ecological conditions relevant to land at Water Eaton, Oxford (hereafter referred to as 'the Site') as identified through a suite of desk and field-based investigations undertaken by EDP in 2015, 2017, 2019, 2021, 2022, and 2023. The purpose of this report is to inform an Ecological Impact Assessment (EclA) and will form an Appendix to the Biodiversity chapter of an Environmental Statement.
- 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 the subject of an outline planning application (with all matters except access reserved for future consideration) for the demolition of existing buildings and the erection of up to 800 dwellings (Class C3); a two form entry primary school; a local centre (comprising: convenience retailing (not less than 350sqm and up to 500sqm (Class E(a))), business uses (Class E(g)(i)) and/or financial and professional uses (Class E(c)) up to 500sqm, café or restaurant use (Class E(b)) up to 200sqm; community building (Class E and F2); car and cycle parking); associated play areas, allotments, public open green space and landscaping; new vehicular, pedestrian and cycle access points; internal roads, paths and communal parking infrastructure; associated works, infrastructure (including Sustainable Drainage, services and utilities) and ancillary development. Works to the Oxford Road in the vicinity of the site to include, pedestrian and cycle infrastructure, drainage, bus stops, landscaping and ancillary development. **Plan EDP 1** shows the boundaries of the Site.
- 1.4 The site covers an area of c.45 hectares (ha) of agricultural land located approximately 5.4km north of Oxford City Centre. The site falls under the jurisdiction of Cherwell District Council (CDC). It is centred approximately on Ordnance Survey Grid Reference SP 505 111. The area comprises agricultural land made up of numerous, variably sized, mostly arable fields to the east of Oxford Road (A4165), to the north of Cutteslowe Park and south of Water Eaton Park and Ride. To the east of the Site is further arable farmland.

Scope of Report

- 1.5 This Ecological Baseline Report summarises the current ecological interest within and around the Site, which has been identified through standard desk and field-based investigations.
- 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 appendices and plans where appropriate);
 - **Section 3** summarises the baseline ecological conditions (with further details also provided within appendices and plans where appropriate) and identifies and evaluates any pertinent ecological features/receptors; and
 - **Section 4** provides a brief conclusion of the survey findings.

Section 2

Methodology (Baseline Investigations)

2.1 This section of the Report summarises the methodologies employed in determining the baseline ecological conditions within and around the Site. Full details of the techniques and process adopted are, where appropriate, provided within annexes and on plans towards the end of this report.

Desk Study

2.2 A desk study was undertaken by EDP in February 2015 and updated in December 2017 and March 2022. This involved collating biodiversity information from the following sources:

- Thames Valley Environmental Records Centre (TVERC);
- Multi-Agency Geographic Information for the Countryside (MAGIC) website¹; and
- Freely available Natural England Open Data².

2.3 The updated desk study involved obtaining the following information:

- International statutory designations (10km radius around the Site);
- National statutory designations (5km);
- Non-statutory local sites (2km);
- Annex II bat species³ records (6km);
- All other protected/notable species records (2km); and
- Invasive species records (2km).

2.4 These search areas were considered to provide sufficient cover of the potential zones of influence⁴ of the proposed development in relation to designated sites, habitats and species.

¹ www.magic.gov.uk

² <http://naturalengland-defra.opendata.arcgis.com/>

³ Annex II species comprise those listed under Annex II of the Habitats Directive (Council Directive 92/43/EEC) which occur in the UK and for which SACs are designated. The objectives of the National Site Network, which includes all SACs and SPAs, are to maintain or, where appropriate, restore such species to a favourable conservation status.

⁴ Zone of Influence - the areas and resources that may be affected by the proposed development.

- 2.5 International, national and local designated site locations are illustrated on **Plans EDP 2 and 3**.

Extended Phase 1 Habitat Survey

- 2.6 The survey technique adopted for the initial habitat assessment was at a level intermediate between a standard Phase 1 Habitat survey technique⁵, based on habitat mapping 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 Habitat survey. This level of survey does not aim to compile a complete floral and faunal inventory.
- 2.7 This 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.
- 2.8 The Extended Phase 1 Habitat survey of the Site was undertaken by a suitably experienced surveyor on 26 February 2015 and update walkover surveys took place on 03 May 2017, 12 May 2021 and 27 September 2023.
- 2.9 February is not within the recommended optimum survey period for such surveys; however, May is, and the survey is therefore not considered to have been limited by climatic or seasonal factors.
- 2.10 Further details of the Extended Phase 1 Habitat survey, habitat descriptions and site photographs are provided within **Annex EDP 1** and displayed on **Plan EDP 1**.

Detailed (Phase 2) Surveys

- 2.11 The scope of Phase 2 surveys undertaken at the Site was defined following the initial studies described above (desk study and Extended Phase 1 Habitat 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

- 2.12 Owing to the presence of a network of hedgerows within the Site, with variable quality and species-diversity, structure and condition, a detailed survey was undertaken to assess their value and whether any of the hedgerows qualify and 'important' with reference to the Wildlife and Landscape criteria provided in Part II of Schedule 1 of the *Hedgerows Regulations 1997*. A survey was completed on 11 November 2021, of all the hedgerows within the survey area. Further details are provided in **Annex EDP 2**, with hedgerow locations and references provided on **Plan EDP 1**.

⁵ Joint Nature Conservation Council (2010) *Handbook for Phase 1 Habitat Survey – A Technique for Environmental Audit* (reprinted with minor corrections for original Nature Conservancy Council publication).

Bird Surveys

- 2.13 The Extended Phase 1 Habitat survey identified suitable habitats for birds within the Site including the arable fields and the hedgerows.

Pilot Winter Bird Surveys

- 2.14 Due to areas of arable land in the east of the Site and their potential to support over-wintering wading and other farmland birds, single pilot winter bird surveys were undertaken on 08 February 2017 and 08 February 2021. These surveys were deemed sufficient to enable an assessment of the value of the Site for over-wintering birds and whether further surveys would be necessary.
- 2.15 Full details of the pilot winter bird survey methodology and results are provided in **Annex EDP 3**.

Breeding Bird Surveys

- 2.16 Breeding bird surveys comprised three 'visits' to the Site with reference to the Common Bird Census 'territory mapping' approach. The surveys were undertaken between April and June 2017. April to June is the optimal time of year for these surveys. A single update survey was undertaken in 2021 to assess changes in population, and a full update survey between April and June 2022.
- 2.17 Full details of the breeding bird surveys are provided in **Annex EDP 3**.

Bat Surveys

Bat Roosting

- 2.18 All trees and buildings within the Site and the immediately surrounding area at St Frideswide's Farm were subject to a preliminary 'ground-level' roost assessment by a Natural England bat licensed ecologist on 03 May 2017. The building roost assessment was updated on 24 June 2021 and trees within the orchard were assessed on 11 June 2021. All external features considered potentially suitable for bats were assessed. Full details are provided in **Annex EDP 4**.
- 2.19 Further emergence and re-entry surveys were undertaken on any buildings considered to have potential to support roosting bats.

Bat Foraging/Commuting Activity

- 2.20 The Extended Phase 1 Habitat survey identified that the Site is of low suitability to support foraging and commuting bats, being predominantly arable fields. Habitats of higher value to bats are limited in extent but include the hedgerows and a narrow woodland/scrub block along the Oxford Road. Bat activity surveys have been undertaken with reference to best

practice guidance⁶, comprising a combination of manual transect surveys and automated detector surveys.

- 2.21 Transect surveys were undertaken between May and September in 2017, 2021, and 2023; and the automated detector deployments were between the same months in 2017, 2019, 2021, and 2023. This was undertaken with reference to the survey effort outlined within the Bat Conservation Trust (BCT) guidance for sites with low habitat suitability for bat activity. Transect routes and static detector locations are displayed on **Plan EDP 4** and full details of the methodology are provided in **Annex EDP 4**.

Reptile Survey

- 2.22 Suitable reptile habitat is located across the Site consisting of narrow, rough grassland field margins within some of the arable fields. These areas are considered suitable to support breeding, basking, foraging and dispersing reptiles.
- 2.23 Therefore, to determine the presence/likely absence of reptile species within the Site, along with their distribution and approximate population size, reptile surveys were undertaken with reference to best practice guidance⁷ within areas of suitable habitat. A total of 56 artificial reptile refugia were left *in situ* for ten days prior to commencement of the surveys. Refugia were checked on seven occasions during May to August 2017. Locations of the reptile refugia are displayed on **Plan EDP 5**.
- 2.24 Full details of the reptile survey methodology and results are provided in **Annex EDP 5**.

Great Crested Newt Survey

- 2.25 There are no ponds located within the Site. There are nine ponds within 500m of the Site, however, a number of the ponds were discovered to be infilled or non-existent following liaison with the landowners or dried out in early spring, and are therefore not suitable for breeding great crested newts (*Triturus cristatus*). The locations of the ponds are illustrated on **Plan EDP 6**.
- 2.26 In 2017, a Habitat Suitability Index (HIS) assessment was undertaken on each pond to assess their suitability to support great crested newts. All ponds were then subject to further survey methods, which included bottle trapping, torching and egg searching, due to the presence of records within and around the Site.
- 2.27 The traditional surveys were undertaken during May 2017 with reference to the survey methodology set out in the English Nature Guidelines⁸, by a holder of a Natural England great crested newt survey licence and an assistant. In accordance with the guidelines,

⁶ Collins, J. (ed.) (2016). *Bat Surveys: for Professional Ecologists: Good Practice Guidelines* (3rd edition). The Bat Conservation Trust, London

⁷ Froglife (1999) Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation. Froglife Advice Sheet 10, Froglife, Halesworth; DMRB (2005) *Nature conservation advice in relation to reptiles and roads. Volume 10, Section 4, Part 7, HA/116/05*. DMRB

⁸ English Nature (2001). *Great Crested Newt Mitigation Guidelines*, English Nature, Peterborough

three survey techniques should be used to determine the presence/absence of great crested newts on-site. The techniques employed were:

- 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 2-litre plastic bottles) that are inserted into the water along the margin of the waterbodies 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
- Egg Searching – a search of any suitable aquatic vegetation to check for great crested newt eggs.

2.28 In addition, where one of these survey methods was not possible, nets were used. These were swept through likely inhabited areas of the pond and then checked for newt adults or efts, which were then re-released into the pond.

Limitations

2.29 It was not possible to bottle trap pond P2 due to the lining of the pond. It was not possible to trap pond P8 due to its concrete sides. Pond P9 dried up after the first survey so no further surveys were possible.

2.30 The inability to trap Ponds P2 and P8 is not considered to have limited the efficacy of the survey, as the use of nets was substituted, meaning that three survey methods were still used.

eDNA Surveys

2.31 Further update surveys were completed in 2019 and 2021 to determine if there had been any change in population levels, this consisted of environmental DNA (eDNA) tests of ponds.

2.32 The eDNA surveys were carried out by a Natural England great crested newt licensed ecologist and assistant, in line with the methodology provided by the Freshwater Habitats Trust⁹. 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;

⁹ 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.

- 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
- 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).

Badgers

2.33 A badger (*Meles meles*) walkover survey was undertaken on 12 May 2021, during which all field boundaries across the Site (where accessible) were searched for evidence of badger activity or setts by a suitably experienced ecologist. The results of the survey can be found in **Annex EDP 7**.

Brown Hairstreak Butterfly

2.34 The Site was considered to contain suitable habitat for brown hairstreak butterfly (*Thecia betulae*). The species is a Priority Species that has a stronghold in Oxfordshire. Surveys for the species, which comprised winter egg searches, were therefore conducted on 11 November 2021, covering all suitable egg-laying substrate within the Site.

2.35 Full details of the survey is provided in **Annex EDP 8** and illustrated on **Plan EDP 24**.

Other Phase 2 Surveys

2.36 Other Phase 2 surveys scoped out, with reasons provided as to why they were not considered necessary/appropriate, are described in **Table EDP 2.2**.

Table EDP 2.2: Ecology Surveys Scoped Out

Survey Type	Reasons for Scoping Out
Botanical surveys (e.g. grassland, hedgerow)	Phase 1 Habitat survey information was sufficient to confirm habitat value, particularly given that the majority of the Site comprises intensively managed agricultural with all habitats present being common and widespread.
Dormouse (<i>Muscardinus avellanarius</i>)	No records were returned for this species, and a number of barriers to dispersal exist around the Site, rendering the hedgerow network effectively cut off from any wider populations which may exist. No suitable woodland areas exist within the Site.
Water Vole (<i>Arvicola amphibius</i>) and Otter (<i>Lutra lutra</i>) surveys	No suitable watercourses exist within the Site – the watercourse along the south-eastern boundary is seasonal and shaded by dense hedgerow canopy across its entire width.

Survey Type	Reasons for Scoping Out
White-clawed crayfish (<i>Austropotamobius pallipes</i>) surveys	No suitable watercourses exist within the Site. No permanent water.
General Invertebrate surveys	Habitats with highest potential (e.g. hedgerows) will be retained where possible as part of the proposed development's inherent mitigation. Majority of site only has limited potential - intensively farmed arable, limited field margins and amenity land.

This page has been left blank intentionally

Section 3 Results (Baseline Conditions)

- 3.1 This section of the report summarises the baseline ecological conditions determined through the course of desk and field-based investigations described in **Section 2**. In particular, this section identifies and evaluates those ecological features/receptors that lie within the Site's potential zone of influence, and which are pertinent in the context of the proposed development. Further technical details are provided within the annexes and plans towards the end of this report.
- 3.2 In 2013, the UK Biodiversity Action Plan (UKBAP) Priority Habitats and Priority Species, and the *Section 41 Species and Habitats of Principal Importance for Conservation under the Natural Environment and Rural Communities (NERC) Act 2006* were rationalised. This rationalisation occurred under the 'Post-2010 Biodiversity Framework'. As a result, a new list of Priority Species and Priority Habitats is now in operation at the UK level. These new lists supersede the former UKBAP; they are the new 'Biodiversity Indicators' that are used to monitor the status of biodiversity at the UK level. Each of the four devolved countries of the UK also have a similar list. Within England, the new rationalised lists of 24 Priority Habitats and 213 Priority Species are provided in *Biodiversity 2020*, which is the national biodiversity policy for England.
- 3.3 Within this Report, where relevant, these species and habitats of national nature conservation priority will therefore be referred to as 'Priority Species' and 'Priority Habitats'¹⁰, except where indicated otherwise. This may be because, for example, a Local Biodiversity Action Plan (LBAP) is in operation that has a different set of LBAP Habitat and LBAP Species, in which case such habitats and species will be explicitly stated in this report for clarity.

Designations

- 3.4 Information regarding designations was obtained during the desk study. Statutory designations (those receiving legal protection) and non-statutory designations (those receiving planning policy protection only) are discussed in turn below.

Statutory Designations

- 3.5 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 (SPA), Special Areas of Conservation (SAC) and Ramsar

¹⁰ See the following for more detail:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/382483/2a._priority_habitats2a_2014_final.pdf;
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/382951/Technical_Background_Priority_Species_abundance_2014.pdf ;
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/382487/4a_Status_of_Priority_Species_2014_final.pdf

Sites. National designations include Sites of Special Scientific Interest (SSSI) and National Nature Reserves (NNR).

- 3.6 No part of the Site is covered by any statutory designation. However, the Oxford Meadows SAC is situated c.1.5km to the south-west. Twelve national statutory designations (SSSI) exist within 5km of the Site. These sites are illustrated on **Plan EDP 2** and described in further detail in **Table EDP 3.1**.

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

Site Name and Designation	Approximate Distance and Direction from the Site	Interest Feature(s)
Oxford Meadows SAC	1.5km South-west	A large area of Lowland Hay Meadow (<i>Alopecurus pratensis</i> , <i>Sanguisorba officinalis</i>), managed in a traditional way for several hundred years. Also present is creeping marshwort (<i>Apium repens</i>), which is found on only one other site.
Port Meadow with Wolvercote Common and Green SSSI	1.5km South-west	Unimproved grassland that is a constituent part of Oxford Meadow SAC, with an unbroken 1000+ year history of grazing.
Pixey and Yarnton Meads SSSI	1.8km South-west	Amongst the best remaining examples of neutral hay meadow in lowland England. Constituent part of Oxford Meadow SAC. Has remained traditional hay meadow for 1000+ years.
Hook Meadow and the Trap Grounds SSSI	1.7km South-west	Unimproved neutral hay meadows with wet meadows in the south containing diverse sedges.
Wolvercote Meadows SSSI	2.0km South-west	Unimproved and semi-improved neutral hay meadow and pasture, a constituent part of Oxford Meadow SAC.
New Marston Meadows SSSI	2.4km South	Unimproved lowland hay meadow, swamp and species-rich hedgerows.
Woodeaton Quarry SSSI	2.5km East	Designated for its geological interest.
Woodeaton Wood SSSI	2.7km East	An intact relic of Shotover Forest, noted for its uncommon plant species, including; stinking iris (<i>Iris foetidissima</i>), wild daffodil (<i>Narcissus pseudo-narcissus</i>) and greater wood-rush (<i>Luzula sylvatica</i>).
Wytham Ditches and Flushes SSSI	3.3km West	Ditches with species-rich eutrophic aquatic and fen flora, and wet neutral unimproved grassland.
Rushy Meadows SSSI	2.9km North-west	A series of unimproved alluvial grasslands along the Oxford Canal.
Wytham Woods SSSI	3.7km South-west	A complex of ancient woodland, wood pasture, common land and old limestone grassland.
Sidling's Copse and College Pond SSSI	3.9km South-east	Calcareous fen, carr, broadleaved woodland and scrub, reedbed, open water, and acid and limestone grasslands.
Magdalen Grove SSSI	4.2km South	Designated for geological interest.

Non-statutory Designations

- 3.7 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 designations, which should be considered at this level, include Local Nature Reserves (LNR) and Ancient Semi-natural Woodland (ASNW) where these are not covered by other designations.
- 3.8 No part of the Site is covered by any non-statutory designation. There are, however, eight LWS, four pLWS, four SLINC, one BBOWTR and one WTR within 2km of the Site boundary. An additional site was returned as part of the desk study which does not have a designation but is considered important for wildlife. These sites are illustrated on **Plan EDP 3** and summarised in **Table EDP 3.2**.

Table EDP 3.2: Non-statutory Designations within 2km of the Site

Site Name	Approx. Distance and Direction from Site at Closest Point	Interest Feature(s)
Local Wildlife Sites		
Meadows West of the Oxford Canal	1,150m West-north-west	Wet meadows bordered by species-rich hedges.
Canalside Meadow-Oxford Canal Marsh	1,350m South-west	Wet meadow with rare marsh habitat, including sedge dominated fen.
Duke’s Lock Pond	1,550m South-west	Diverse pond with extensive reedbed.
Meadow North of Goose Green	1,350m South-south-west	Small meadow with a mixture of tall wetland habitat and wet grassland.
Loop Farm Flood Meadows	1,550m West	Wet, species-rich, cattle grazed pasture with a small area of reedbed and some recovering fen and elements of lowland meadow habitats.
Wet Wood and Swamp nr. Yarnton	1,500m West	Wet willow woodland and tall wetland vegetation.
Cassington to Yarnton Gravel Pits	1,950m West-south-west	Large area of gravel pits, developing reedbed and silt lagoons with important populations of wintering wildfowl and diverse wetland vegetation.
Almonds Farm and Burnt Mill Fields	1,650m South-east	Flush along ditch and tall fen vegetation in field to west. A number of botanical rarities.
Proposed Local Wildlife Sites		
Bypass Meadows	850m South-south-east	Two fields with rough grassland, tall herb and pond sedges.
Cassington to Yarnton Pits East Extension	1,650m West-south-west	
Wolvercote Mill Swamp	1,900m South-west	Small area of wetland habitat between two channels of the River Thames.

Site Name	Approx. Distance and Direction from Site at Closest Point	Interest Feature(s)
Line Ditch	1,800m South	A drainage ditch approximately 1km long. Well vegetated with common reed and greater pond sedge.
Sites of Local Importance for Nature Conservation		
Linkside Lake	350m South	Eutrophic standing water with grass snake, and various plant and bird species.
Duke's Meadow	1,550m South-south-west	Two fields with remnants of lowland meadow habitat.
Oxford Canal	1,450m South	Canal supporting a variety of flora and fauna, with well vegetated banks. Forms a corridor from countryside into the city.
Victoria Arms Spinney	2,000m South-south-east	Small area of secondary woodland.
Others		
Stratfield Brake WTR	600m West-north-west	Mature and new woodland adjacent to a large wetland project and open ground.
North Meadow West of Canal	1,200m West-north-west	Small area of unimproved grassland (lowland meadow remnant and floodplain grazing marsh), including some species-rich areas.
Oxey Mead BBOWTR	2,000m West-south-west	Pixey and Yarnton Meads SSSI.

Habitats

- 3.9 The distribution of different habitat types within and adjacent to the Site, as identified through the February 2015 Extended Phase 1 Habitat survey and subsequent updates in May 2017, May 2021 and September 2023, 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 3.3**.

Table EDP 3.3: Summary of Habitats within the Site

Habitat or Feature	Distribution within Site	Intrinsic Ecological Importance	Potential/Confirmed Value to Protected Species				
			Spp.	Breeding	Foraging	Refuge	Dispersal
Arable	Most prevalent habitat in east of Site.	Negligible , owing to limited botanical diversity and intensive management.	Birds	✓	✓	✓	✓
			Badger		✓		✓

Habitat or Feature	Distribution within Site	Intrinsic Ecological Importance	Potential/Confirmed Value to Protected Species				
			Spp.	Breeding	Foraging	Refuge	Dispersal
Species-poor semi-improved grassland	Unmanaged field margins across arable fields to the east. Many of these margins are very small. Small area alongside the track directly to the west of St Frideswide's Farm.	Site , owing to limited extent, botanical and structural diversity.	Birds		✓		
			Bats		✓		
			Badger		✓		✓
			Amphibians		✓		✓
			Reptiles		✓		✓
Ruderal	Isolated patches across the Site associated with disturbed or unmanaged land. Largest areas associated with buildings at St Frideswide's Farm.	Site , owing to botanical composition and diversity.	Birds		✓		
			Bats		✓		
			Amphibians		✓	✓	✓
			Reptiles	✓	✓	✓	✓
Species-poor and species rich hedgerow and scattered mature broadleaved trees	Low distinctiveness although forms part of notable habitat corridor throughout the Site and with offsite habitats.	Local , owing to maturity and species diversity, limited by position at edge of ecological network.	Birds	✓	✓	✓	✓
			Bats	✓	✓	✓	✓
			Badger	✓	✓	✓	✓
			Amphibians		✓	✓	✓
			Reptiles	✓	✓	✓	✓
Broad-leaved Woodland	Small areas along Oxford Road.	Local , owing to limited extent and botanical diversity, maturity and position in ecological network. Does not fit the	Birds	✓	✓	✓	
			Bats	✓	✓	✓	
			Badger	✓	✓	✓	
			Amphibians		✓	✓	

Habitat or Feature	Distribution within Site	Intrinsic Ecological Importance	Potential/Confirmed Value to Protected Species				
			Spp.	Breeding	Foraging	Refuge	Dispersal
		description of the Lowland Mixed Deciduous Woodland Priority Habitat due to species composition and lack of ground flora.	Reptiles	✓	✓	✓	
Scattered Scrub	Small areas along the Oxford Road and Pipal's Barns.	Site owing to limited botanical diversity and lack of maturity.	Birds	✓	✓	✓	
			Badger	✓		✓	
			Amphibians		✓	✓	
			Reptiles	✓	✓	✓	
Watercourse	Seasonally wet ditch running along the eastern boundary of the far south-eastern field.	Site , limited aquatic vegetation owing to heavily shaded nature of channel.	Birds		✓		
			Bats		✓		✓
			Water Vole				✓
Built development/hard standing	Small amount of hard standing along tracks leading to Water Eaton estate and St Frideswide's Farm. Single house and associated barns at Pipal's Barns.	Negligible , owing to absence of natural habitat.	Birds	✓		✓	
			Bats	✓		✓	

3.10 As noted within **Table EDP 3.3**, the majority of land cover within the Site is arable land of Negligible intrinsic ecological value, with small areas of tall ruderal vegetation, species-poor semi-improved grassland and a seasonal watercourse of poor quality. However, the small areas of woodland, hedgerows and the tree network are considered to be of Local value.

3.11 A number of the habitats or other features onsite also require consideration in relation to their importance in maintaining populations of protected and/or notable species, as discussed below.

Protected and/or Notable Species

3.12 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 appendices and plans where referenced.

Birds

- 3.13 The desk study returned a large number of notable bird records from within 2km of the Site. However, the majority of these were in relation to nearby wetlands, resulting in many wildfowl and wader records. Pertinent notable species include greylag goose (*Anser anser*), mallard (*Anas platyrhynchos*), grey partridge (*Perdix perdix*), kestrel (*Falco tinnunculus*), golden plover (*Pluvialis apricaria*), lapwing (*Vanellus vanellus*), stock dove (*Columba oenas*), barn owl (*Tyto alba*), skylark (*Alauda arvensis*), meadow pipit (*Anthus pratensis*), dunnoek (*Prunella modularis*), yellowhammer (*Emberiza citrinella*), reed bunting (*Emberiza schoeniclus*), linnet (*Linaria cannabina*), house sparrow (*Passer domesticus*), tree sparrow (*Passer montanus*), fieldfare (*Turdus pilaris*) and redwing (*Turdus iliacus*).

Winter Bird Survey

- 3.14 The full results of the winter bird surveys are provided in **Annex EDP 3** and displayed on **Plans EDP 7** and **8**. In total, the surveys recorded 31 species of bird within the Site. Of these 18 species were of conservation concern (6 Red list, 11 Amber list and 1 Schedule 1).
- 3.15 The Site was not considered to represent an important over-wintering resource for birds, based on the assemblage recorded, and relative abundance, combined with the habitats present on-site. As such, no further surveys were considered necessary. The assemblage on-site is considered to be of Local value.

Breeding Bird Survey

- 3.16 The breeding bird surveys undertaken on the Site recorded a typical assemblage of widespread lowland farmland birds. The birds recorded were utilising the arable field, hedgerows and scrub as shown on **Plans EDP 9–11**.
- 3.17 During the survey visits in 2022, 45 species were recorded within the Site. Of the 45 species recorded, 30 were either listed on the Green List of Birds of Conservation Concern or not listed at all (those species considered non-native to the UK). One of the Green List species (red kite (*Milvus milvus*)) recorded is on Schedule 1 of the *Wildlife and Countryside Act 1981*, as amended and is recorded as possibly breeding.
- 3.18 Of the remaining 15 species, 8 are listed on the Red List and 7 on the Amber List. Of those on the Amber list, two species were recorded as confirmed breeding (song thrush (*Turdus philomelos*) and dunnoek), three as possibly breeding (whitethroat (*Silvia curruca*), mallard and meadow pipit) and two as probably breeding (wren (*Troglodytes troglodytes*) and wood pigeon (*Columba palumbus*)). Of those on the Red list, three species were recorded as confirmed breeding (linnet, skylark and starling (*Sturnus vulgaris*)), one recorded as probably breeding (yellowhammer) and four as possibly breeding (greenfinch (*Carduelis chloris*), house sparrow, tree sparrow and house martin (*Delichon urbica*)).

- 3.19 Nine listed species previously recorded in 2017 were not observed during the 2022 surveys. Three of these are on the Red List and six are on the Amber List. Of those on the Amber list, one species was recorded as confirmed breeding (reed bunting), one species as possible breeding (bullfinch (*Pyrrhula pyrrhula*)), one species as probably breeding (stock dove) and three as unknown due to being on the green list at the time of survey and therefore only the first occurrence was recorded (sparrow hawk (*Accipiter nisus*), moorhen (*Gallinula chloropus*) and rook (*Corvus frugilegus*)). Of those on the Red List, one species was recorded as confirmed breeding (yellow wagtail (*Motacilla flava*)), one as probably breeding (lapwing) and one as non-breeding (swift (*Apus apus*)).
- 3.20 Yellow wagtail were recorded on a 2022 visit but was part of the lost data. It is considered that the species is possibly breeding on site.
- 3.21 Barn owl (Schedule 1) is possibly breeding nearby and tawny owl (*Strix aluco*) (Amber list) is also likely breeding on site despite not having been recorded during the surveys. This is due to surveys being carried out at a time when owls are not active.
- 3.22 The habitat supports a mostly typical and widespread assemblage of lowland farmland breeding birds with a few locally significant populations. Due to the range of species and numbers recorded within the Site the breeding bird population is considered to be of District importance.

Bats

- 3.23 A number of records of common bat species exist within the 2km search area, including aural and roost records of common pipistrelle (*Pipistrellus pipistrellus*), and aural records of soprano pipistrelle (*Pipistrellus pygmaeus*), noctule (*Nyctalus noctula*), Natterer's (*Myotis nattereri*), and Daubenton's (*Myotis daubentonii*) bats. An unconfirmed aural record of Bechstein's bat (*Myotis bechsteinii*) was received from within the 6km search area, although no roost records were returned, and this species is very difficult to separate acoustically from other *Myotis* species by sonogram or audio recording only.

Bat Roosting

- 3.24 The Site contains five buildings, associated with these buildings is Pipal Cottage, which is not within the red line boundary and therefore was not assessed. There are another 12 buildings/built structures on St Frideswide's farm, which is adjacent to the eastern boundary of the site all of which were assessed for their potential to support roosting bats. Five of these buildings (F1, F2, F8, B3 and B5) were found to support bat roosts in 2021. F1 was found to support only a single soprano pipistrelle bat. F2 and B3 were both found to support a roost of a single common pipistrelle bat. B5 was found to support two common pipistrelle bats and a single soprano pipistrelle bat. F8 was found to support a roost of a single bat of an undetermined species. Due to bat activity in the surrounding area recorded during surveys of the building, it is likely that the roost is of a pipistrelle species.
- 3.25 A total of 36 trees were identified as offering potential to support roosting bats, with 14 identified as high potential, 18 as moderate potential, and four as low potential. The ground

level assessment of trees for roosting bats in 2017 and 2021 or subsequent general activity surveys did not confirm any roosts.

- 3.26 Full details of the building and tree assessment are provided in **Annex EDP 4** and illustrated on **Plan EDP 1**.

Bat Foraging/Commuting Activity

- 3.27 The results from the manual transect and automated static detector surveys undertaken in 2017, 2019 and 2021 are summarised below and detailed results are provided in **Annex EDP 4**. The distribution of bat activity recorded around the Site during these surveys is illustrated on **Plans EDP 12–22**.
- 3.28 The activity surveys recorded low to moderate levels of foraging and commuting bat activity across the Site. The species diversity at the Site was moderately high, with at least nine bat species/species groups recorded (*Myotis* sp. bats were not identified to species level). Such diversity is not unexpected for a site of this size in southern England.
- 3.29 The majority of activity during the transect surveys related to boundary habitats including the hedgerows. Bat activity was evenly spread across the boundaries of the Site.
- 3.30 The common and widespread generalist species, common pipistrelle and soprano pipistrelle, accounted for the vast majority of foraging and commuting activity. However, small numbers of rarer bats, notably barbastelle (*Barbastellus barbastellus*), were recorded throughout the Site.
- 3.31 The bat assemblage recorded within the Site is considered to be moderately high but typical of an urban edge farmland site in southern England. The assemblage of foraging/commuting bats has therefore been valued at a Local level.

Reptiles

- 3.32 The most recent records of reptiles were from 2009 for grass snake (*Natrix helvetica*) and slow worm (*Anguis fragilis*) recorded 750m south of the Site. TVERC returned two historic records of adder (*Vipera berus*) from 1987 and 2000.
- 3.33 Full details of the reptile surveys are provided in **Annex EDP 5** and illustrated on **Plan EDP 23**. Only one adult grass snake and two juveniles were found in the Site just north of the farm buildings and no other reptiles were found. The small population of grass snake is of Local level importance.

Great Crested Newt

- 3.34 The desk study returned records of great crested newt, common toad (*Bufo bufo*) and common frog (*Rana temporaria*) from the surrounding landscape.

- 3.35 No great crested newts were recorded during the traditional surveys undertaken in 2017 or the eDNA surveys in 2021. Therefore, great crested newt are considered likely absent from the Site.

Badgers

- 3.36 Several badger records were received from the desk study, almost all of which were recorded dead on roads.
- 3.37 Some evidence of badger activity (latrines and footprints) was recorded across the Site throughout 2015 and 2017 along hedgerows/field boundaries, particularly associated with the arable land in the east of the Site. Two disused setts were recorded within the Site, within a hedgerow to the south-east of St Frideswide's Farm and within the hedgerow south of the Water Eaton access track as illustrated on **Plan EDP 1**. The sett south-east of St Frideswide's was deemed to be partially active in 2017, but no activity has been recorded since. No activity or signs were found in the 2021 survey.
- 3.38 The presence of two disused setts and evidence of badger activity suggest that the Site forms or previously formed part of the territory of at least one badger clan. Badgers are relatively common and widespread nationally and within Oxfordshire and the presence of a sett on a site of this size is consequently not unexpected. The relatively small population present is therefore considered to be of Site level value.

Brown Hairstreak Butterfly

- 3.39 The presence of blackthorn (*Prunus spinosa*) and elm (*Ulmus* sp.) within the on-site hedgerows provides potential for the Site to support brown hairstreak butterfly.
- 3.40 During the survey carried on in November 2021, brown hairstreak eggs were recorded within hedgerows H1, H4, H10, H13 and H15 within the Site, confirming the presence of a breeding population of the species.
- 3.41 It is considered that the ability of the Site to support significant numbers of brown hairstreak adults is limited by current agricultural management of the hedgerow network, which included heavy flailing on all side on at least an annual basis, thereby, periodically destroying the vast majority of the egg-laying habitat and eggs themselves.
- 3.42 Nevertheless, owing to the scarcity of the species, it is considered that the population present at the Site is of Local level ecological value.
- 3.43 Full details of the survey are given in **Annex EDP 8** and results detailed on **Plan EDP 24**.

Other Species

Hedgehog

- 3.44 The desk study returned a number of records of hedgehog (*Erinaceus europaeus*) within a 2km radius of the Site. No hedgehogs were incidentally recorded within the Site during the field surveys, though suitable habitat for this species is considered to be present, primarily associated with the boundaries. Although hedgehogs are declining, any population present is not likely to be of more than Site level value given the common and widespread distribution of this species.

Polecat

- 3.45 A small number of records for polecat (*Mustela putorius*) were received from TVERC, suggesting that this species has recolonised the region after their historic decline. It is likely that they are using the Site due to the extent of suitable habitat available to them. Any population present is not likely to be of more than Site level value, given the relative quality and extent of the habitats.

Brown Hare

- 3.46 A number of hare sightings were made within the arable land of the Site, during the breeding bird surveys in 2017. No hares were recorded in 2022. Given the extent of habitat, the number recorded is not considered to represent an important population of this species, and therefore is not likely to be of more than Site level value.

Invertebrates

- 3.47 In relation to the Site's habitat, the desk study returned a fairly large number of notable or important invertebrate species. However, the majority of these were associated with flower-rich, semi-natural habitats along the Thames floodplain. Some potentially pertinent records include brown hairstreak butterfly and cinnabar moth (*Tyria jacobae*).
- 3.48 The Site is not considered to support significant populations of terrestrial or aquatic invertebrates given the dominance of arable and amenity grassland habitats and poor quality of the pond. Opportunities are primarily limited to the hedgerow network and scattered mature trees. With the exception of brown hairstreak butterflies, invertebrates are not considered to warrant inclusion as an Important Ecological Feature (IEF) in their own right and the assessment of effects with mitigation relating to these higher quality habitats acting as a surrogate to safeguard such interests.

This page has been left blank intentionally

Section 4 Summary and Conclusions

4.1 Based on the baseline investigations described above, the Important Ecological Features pertinent to an Ecological Impact Assessment in respect of the proposed development at the Site are listed in **Table EDP 4.1**.

Summary of Survey Findings

Table EDP 4.1: Summary of Important Ecological Features to be considered within the EclA

Ecological Feature	Description	Geographic Significance	Taken forward as IEF to ES?
Designated Sites			
Oxford Meadow SAC (and constituent SSSI)	A large extent of unimproved neutral lowland and meadow.	International	Yes
Habitats			
Arable	Makes up the majority of habitat onsite.	Less than Local (Site)	No
Semi-improved grassland/tall ruderal	Small patches around field boundaries across the Site.	Less than local (Site)	No
Hedgerows	Located along majority of field boundaries. Low distinctiveness although forms part of notable habitat corridor throughout the Site and with offsite habitats.	Local	Yes
Broadleaved woodland	Narrow strip of woodland of limited value but forms part of a notable north-south corridor along the Oxford Road. Value limited by presence extent and lack of notable ground flora.	Local	Yes
Dense scrub	Small areas of dense scrub along the Oxford Road alongside areas of woodland. Increased value because of connectivity with woodland despite small extent.	Local	Yes
Watercourses	A small watercourse running in a southerly direction along the eastern boundary.	Less than Local (Site)	No

Ecological Feature	Description	Geographic Significance	Taken forward as IEF to ES?
Protected Species			
Winter bird assemblage	No significant wintering populations onsite, although the hedgerows and trees and arable stubble offer refuge for small farmland passerines. Barn owl recorded previously recorded in a nest box at St Frideswide's farm, although not present every year.	Local	Yes
Breeding bird assemblage	Locally significant populations of farmland birds breed within the Site, including 8–14 pairs of skylark, 1–2 pairs of yellow wagtail and 2–3 pairs of lapwing in some years.	District	Yes
Roosting bats	The Site and its surroundings contain 17 buildings, 5 of which have potential to support roosting bats. Buildings F1, F2, B3, B5 and F8 were confirmed as minor pipistrelle roosts.	Local	Yes
Foraging and commuting bats	Foraging and commuting by mostly common and widespread bat species with low numbers of uncommon species including barbastelle.	Local	Yes
Badgers	A single, partially active outlier sett is located in the east of the Site. Latrines and footprints have been recorded across the Site, suggesting it forms part of a badger clan's territory.	Less than Local (Site)	Yes (included as an IEF due to legal protection)
Reptiles	A small population of grass snake was recorded along field boundaries north of St Frideswide's Farm.	Less than Local (Site)	Yes (included as an IEF due to legal protection)
Butterflies	Non-significant breeding population of brown hairstreak butterfly on site.	Local	Yes

Annex EDP 1

Habitat Descriptions and Site Photographs

A1.1 The principal habitats within and adjacent to the Site are described below, with illustrative photographs provided where appropriate. These descriptions have been informed by the following surveys undertaken by suitably experienced surveyors:

- Extended Phase 1 Habitat surveys in February 2015 and updated on 05 May 2017 and 12 May 2021; and,
- Incidental recordings made during other survey work on site.

A1.2 The following descriptions should be read in conjunction with **Plan EDP 1**.

Habitats

A1.3 The Site predominantly comprises intensively farmed arable fields and species-poor rough grassland margins, dissected by dense continuous hedgerows of variable species richness, and bordered by a small, seasonal watercourse in the far south-eastern corner. A small band of broadleaved semi-natural woodland runs along the Oxford Road.

Arable

A1.4 The arable fields in the eastern portion of the Site are typically sown with cereal crops (**Image EDP A1.1**). These fields are subject to fertilisation, pesticide application and annual ploughing to the field margins.



Image EDP A1.1: Typical arable field in east of the Site with little or no field margin.

- A1.5 These homogenous habitats are of Negligible ecological value in their own right. However, they have limited potential to support farmland birds.

Species-poor Semi-improved Grassland/Tall Ruderal Vegetation

- A1.6 Many of the arable fields have no notable arable field margins. The limited margins present along the hedgerow boundaries are dominated by common wayside grasses and weeds such as groundsel (*Senecio vulgaris*), hogweed (*Heracleum sphondylium*), cock's foot (*Dactylis glomerata*), nettle (*Urtica dioica*) and perennial rye-grass (*Lolium perenne*), and remnants of previous crops, such as oilseed rape.
- A1.7 Some of the wider field margins (**Images EDP A1.2** and **A1.3**) are often dominated by tall ruderal vegetation. The widest of these runs alongside the Site boundary with the complex of derelict buildings at St Frideswide's Farm. Species diversity is generally still low due to the disturbed nature, with regular pesticide, herbicide and fertilisers from the arable crop.



Image EDP A1.2: Wider field margin, dominated by tall ruderal vegetation.



Image EDP A1.3: Wider field margin, dominated by tall ruderal vegetation, next to derelict buildings at St Frideswide's Farm.

- A1.8 As a result, most species found are those tolerant of high nutrient environments, including Yorkshire fog (*Holcus lanatus*), false oat-grass (*Arrhenatherum elatius*), cock's foot, nettle, cow parsley (*Anthriscus sylvestris*), comfrey (*Symphytum officinale*) and broad-leaved dock (*Rumex obtusifolius*).

Hedgerows

- A1.9 The field boundaries within the Site are delineated by mature, native hedgerows of variable species composition and structure. The majority of the hedgerows are relatively species-rich (5+ species along length), regularly managed and roughly 1.5m high (**Image EDP A1.4**).
- A1.10 A small number of species-poor hedgerows exist, one along the track into the Water Eaton estate and along the southern and eastern boundaries of the south-westernmost arable field.
- A1.11 Species found in the hedgerows included: field maple (*Acer campestre*), hawthorn (*Crataegus monogyna*), blackthorn, elder (*Sambucus nigra*), sycamore (*Acer pseudoplatanus*), elm (*Ulmus glabra*), ash (*Fraxinus excelsior*), bramble (*Rubus fruticosus* agg.), ivy (*Hedera helix*), horse chestnut (*Aesculus hippocastanum*), oak (*Quercus robur*), honeysuckle (*Lonicera periclymenum*), dog rose (*Rosa canina*), hazel (*Corylus avellana*) and willow (*Salix* sp.). The majority of the hedgerows are made up of mostly blackthorn, field maple and hawthorn, with other species scattered throughout.
- A1.12 Owing to their species diversity and maturity, the hedgerows are considered to be of Local ecological value in their own right, forming a key component of the local habitat networks and Green Infrastructure. Furthermore, field surveys have confirmed that these habitats support, or are likely to support, a range of protected species, including nesting birds and foraging/commuting bats.



Image EDP A1.4: Species-rich hedgerow.

Broad-leaved Woodland and Mature Trees

- A1.13 One small area of broad-leaved woodland is present within the Site, alongside the Oxford Road.
- A1.14 The woodland is sparse with some scrub, it is dominated by sycamore (*Acer pseudoplatanus*) and Norway maple (*Acer platanoides*). Other tree species found within the woodland are, ash, oak, field maple, cherry (*Prunus avium*) and an understorey of goat willow (*Salix caprea*), elm, hawthorn, elder, apple (*Malus* sp.), damson (*Prunus domestica*) and blackthorn. The ground flora is limited, with large areas covered in ivy. The Ancient Woodland Indicator (AWI) species, lords and ladies (*Arum maculatum*), was recorded, however, in the absence of other indicators the woodland is not considered to qualify as ASNW. Other ground flora were ground ivy (*Glechoma hederacea*), wood avens (*Geum urbanum*), bramble, cow parsley, broad leaved dock (*Rumex obtusifolius*), bristly oxtongue (*Helminthotheca echioides*), common nettle (*Urtica dioica*), white dead nettle (*Lamium album*), creeping thistle (*Cirsium arvense*), common hogweed (*Heracleum sphondylium*), creeping buttercup (*Ranunculus repens*), hedge woundwort (*Stachys sylvatica*), forget-me-not (*Myosotis* sp.), cleavers (*Galium aparine*), dog rose (*Rosa canina*), false brome (*Brachypodium sylvaticum*), dogwood (*Cornus sanguinea*) and garlic mustard (*Alliaria petiolata*).
- A1.15 The broad-leaved woodland across the Site varies in its species composition, age, structure and condition. However, it is typically dominated by fast-growing successional species.

Owing to its maturity, connectivity with higher quality habitats off-site and the presence of AWI in the ground flora, albeit relatively limited, the broad-leaved woodland is considered to be of Local level value. The woodland also provides potentially suitable habitat for breeding/foraging birds, roosting/foraging bats, badgers, and common species of amphibians.

Watercourse

- A1.16 A small section of seasonally running water runs in a southerly direction along the eastern boundary of the Site. The watercourse supports a shallow flow, dry during summer, and is heavily shaded by the adjacent hedgerow. The overhanging vegetation limit opportunities for aquatic species and no such species were recorded at the time of survey.
- A1.17 The watercourse supports no aquatic vegetation but provides an important wildlife corridor through the local landscape. Owing to its heavily shaded nature, limited aquatic vegetation and limited/no flow in summer months, the stream is not considered to have significant potential to support fish, white-clawed crayfish, water voles, otters or aquatic invertebrates. The stream is therefore considered to be of Site level ecological value.

Ditches

- A1.18 A small number of field boundary ditches feed the watercourse. These ditches carry green field run-off following heavy rain events but are predominantly dry, relatively overgrown by the hedgerows and do not support any notable riparian/aquatic vegetation. They are therefore not considered to be of greater than Site level value.

Annex EDP 2 Hedgerow Survey

Methodology

- A2.1 The Extended Phase 1 Habitat survey identified a number of hedgerows on the Site that have potential to qualify as ecologically 'Important' under the *Hedgerows Regulations 1997*. The ecological importance of all hedgerows within the Site was subsequently assessed by an experienced EDP ecologist on 09 June 2022.
- 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 Site's hedgerows. The *Hedgerows Regulations 1997* serve the purpose of ensuring the retention of important countryside hedgerows; their removal only being approved by the relevant local authority.
- A2.3 The aims of the hedgerow assessment were to:
- Identify hedgerows that are classified as 'important' under the ecological criteria of the *Hedgerows Regulations (1997)*; and
 - Identify hedgerows that, although not deemed 'important' under the ecological criteria of the *Hedgerows Regulations 1997*, have ecological value in terms of species diversity, or as potential wildlife corridors.
- A2.4 Overall, 20 hedgerows qualified for assessment against the *Hedgerow Regulations 1997* criteria, within the Study Area. 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.
- A2.5 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 'Red Data Birds in Britain' (Batten, 1990), or any species categorised as 'endangered', 'extinct', 'rare' or 'vulnerable' by any of the British Red Data Books.

A2.6 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 (*Populus nigra*), large-leaved lime (*Tilia platyphyllos*), small-leaved lime (*Tilia cordata*) or wild service-tree (*Sorbus torminalis*);
 - Five Schedule 3 species and four listed features; and
 - 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 4 points or more (1 point per connection of the hedgerow with another, 2 points per connection of the hedgerow to a pond or broad-leaved woodland; and
 - A parallel hedge within 15m of the hedgerow.

A2.7 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

- A2.8 The detailed results of the hedgerow survey are provided in **Table EDP A2.1**.
- A2.9 In summary, 2 of the 20 hedgerows surveyed qualify as 'Important' under the *Hedgerow Regulations* 1997, namely hedgerows H7 and H14.
- A2.10 H17 is not considered important due to being less than 30 years old.
- A2.11 Whilst many of the hedgerows were not considered 'Important' 11 of the 20 hedgerows are considered to be species-rich as illustrated on **Plan EDP 1**.

Table EDP A2.1: Hedgerow Survey Results.

Hedgerow Number														Mean Count of Schedule 3 Species from the 30m Samples (sample size)	Schedule 2 and 3 Woodland Plants	Bank/Wall	Gaps <10%	Standard Trees (min. 1/50m)	Ditch	Connections (4 or >4)	Parallel Hedge	Adjacent footpath, Bridleway, Road Used as Public Path or Byway Open to all Traffic?	Important Hedgerow
	Ash (<i>Fraxinus excelsior</i>)	Blackthorn (<i>Prunus spinosa</i>)	Dogwood (<i>Cornus sanguinea</i>)	Elder (<i>Sambucus nigra</i>)	Elm (<i>Ulmus</i> spp.)	Guelder Rose (<i>Viburnum opulus</i>)	Hawthorn (<i>Crataegus monogyna</i>)	Hazel (<i>Corylus avellana</i>)	Maple, Field (<i>Acer campestre</i>)	Oak, Pedunculate (<i>Quercus robur</i>)	Rose sp. (<i>Rosa</i> spp.)	Alder (<i>Alnus</i> sp.)	Wild Privet (<i>Ligustrum vulgare</i>)										
H1	✓	✓		✓	✓		✓							3	x	x	✓	✓	x	x	x	✓	x
H2		✓			✓		✓							3	x	x	x	✓	x	x	x	x	x
H3		✓		✓	✓		✓		✓		✓			4	x	x	✓	✓	✓	✓	x	x	x
H4	✓	✓		✓	✓		✓		✓		✓			4	x	x	✓	✓	✓	x	x	x	x
H5a	✓	✓	✓	✓			✓		✓		✓			4	x	x	✓	x	x	x	x	x	x
H5b		✓	✓				✓		✓		✓			5	x	x	✓	✓	✓	x	x	x	x
H6a	✓	✓		✓	✓		✓		✓					4	x	x	✓	✓	✓	x	x	x	x
H6b		✓		✓	✓		✓		✓		✓			4	x	x	✓	✓	x	x	x	x	x
H7	✓	✓		✓	✓	✓	✓		✓	✓	✓			6	x	x	✓	✓	✓	x	x	x	✓
H8a		✓	✓	✓			✓			✓				3	x	x	✓	x	x	x	x	x	x
H8b		✓		✓			✓	✓		✓				3	x	x	✓	✓	x	x	x	x	x
H9		✓		✓	✓		✓		✓					3	x	x	✓	✓	x	x	x	x	x
H10		✓					✓							2	x	x	✓	x	x	x	x	x	x

Hedgerow Number													Mean Count of Schedule 3 Species from the 30m Samples (sample size)	Schedule 2 and 3 Woodland Plants	Bank/Wall	Gaps <10%	Standard Trees (min. 1/50m)	Ditch	Connections (4 or >4)	Parallel Hedge	Adjacent footpath, Bridleway, Road Used as Public Path or Byway Open to all Traffic?	Important Hedgerow
	Ash (<i>Fraxinus excelsior</i>)	Blackthorn (<i>Prunus spinosa</i>)	Dogwood (<i>Cornus sanguinea</i>)	Elder (<i>Sambucus nigra</i>)	Elm (<i>Ulmus</i> spp.)	Guelder Rose (<i>Viburnum opulus</i>)	Hawthorn (<i>Crataegus monogyna</i>)	Hazel (<i>Corylus avellana</i>)	Maple, Field (<i>Acer campestre</i>)	Oak, Pedunculate (<i>Quercus robur</i>)	Rose sp. (<i>Rosa</i> spp.)	Alder (<i>Alnus</i> sp.)										
H11						✓							1	x	x	x	x	x	x	x	x	
H12	✓	✓	✓	✓		✓		✓		✓			5	x	x	✓	✓	x	x	x	x	
H13	✓	✓			✓		✓	✓				✓	6	x	x	✓	✓	x	x	x	✓	
H14	✓	✓	✓		✓		✓	✓	✓	✓			6	x	x	✓	✓	✓	x	x	✓	
H15	✓	✓		✓	✓		✓						4	x	x	✓	✓	x	x	x	x	
H16		✓		✓			✓						3	x	x	✓	✓	x	x	x	x	
H17	✓	✓			✓		✓	✓	✓	✓	✓	✓	10	x	x	✓	✓	x	x	x	x	

This page has been left blank intentionally

Annex EDP 3 Bird Surveys

Winter Bird Survey

- A3.1 Two winter bird surveys were undertaken on the Site: a pilot survey in 2017 and an update to that survey in 2021. The surveys were undertaken with reference to standard methodology, 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.
- A3.2 The surveys were undertaken during suitable weather conditions: wind speed was low, visibility high and there was no rain. It is therefore considered that the results provide a representative overview of the winter bird resource at the Site.
- A3.3 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;
 - Birds of Conservation Concern 5 the population status of birds in the UK¹¹, Channel Islands and Isle of Man (BoCC) - 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 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

¹¹ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.

- Green List species have a favourable conservation status.
- Species of Principal Importance included under Section 41 (England) of the NERC Act 2006.

Limitations

- A3.4 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 dunnoek. Despite this, a sufficient assessment of the Site's value to wintering birds has been made to inform this Report.
- A3.5 Since the surveys undertaken in 2017 and 2021 some birds have been moved from the Green list to the Amber or Red lists, such as wren and woodpigeon. Species listed on the Green list were recorded on first occurrence only, meaning that their population is likely under-represented in the results. These species are common and widespread, and survey data is therefore not considered to be limited.

Results

- A3.6 In total, the winter bird surveys recorded 31 species of bird within the Site. Of these 18 species were of conservation concern with 6 on the Red list, 11 on the Amber list and 1 classed as Schedule 1. A summary of those species observed during the surveys is provided in **Tables EDP A3.1** and **A3.2**.

Table EDP A3.1: Bird Species on the Schedule 1, Red and Amber List Recorded During the Wintering Bird Surveys within the Site

Species	National Status	Local Status	Distribution within Site	Peak count 2017	Peak count 2017
Skylark (<i>Alauda arvensis</i>)	Red list S.41 NERC	Common resident and passage migrant	Three individuals recorded on both surveys, spread throughout arable fields.	3	3
Rook (<i>Corvus frugilegus</i>)	Amber List	Very abundant resident	Recorded within arable field in northern half of the Site.	0	1
Stock dove (<i>Columba oenas</i>)	Amber List	Numerous Resident	Recorded flying over the Site.	1	0
Wood pigeon (<i>Columba palumbus</i>)	Amber List	Very numerous resident	Recorded close to the centre of the Site.	1	1
Black-headed gull (<i>Chroicocephalus ridibundus</i>)	Amber List	Common visitor and a small breeding population	Sightings spread throughout arable fields.	1	6
Yellowhammer (<i>Emberiza citronella</i>)	Red list S.41 (NERC)	Common resident	Recorded within or close to hedgerows throughout the Site	3	3
Reed bunting (<i>Emberiza schoeniclus</i>)	Amber List S.41 (NERC)	Common resident	Recorded at northern end of Site within hedgerow.	1	0
Kestrel (<i>Falco tinnunculus</i>)	Amber List	Common resident	Single hunting adult at the northern end of the Site.	1	1
Linnet (<i>Linaria cannabina</i>)	Red List S.41 (NERC)	Common resident	Recorded in the northern arable fields.	2	0
Red kite (<i>Milvus milvus</i>)	Schedule 1 Green List	Established resident	Recorded close to the centre of the Site.	0	1
House Sparrow (<i>Passer domesticus</i>)	Red List S.41 (NERC)	Abundant resident	Recorded close to the centre of the Site.	0	1
Dunnock (<i>Prunella modularis</i>)	Amber List	Common and widespread resident	Mostly associated with hedgerows, found throughout the Site.	5	8
Bullfinch (<i>Pyrrhula pyrrhula</i>)	Amber List S.41 (NERC)	Common resident	Recorded near to St Frideswide's Farm.	1	0

Species	National Status	Local Status	Distribution within Site	Peak count 2017	Peak count 2017
Redwing (<i>Turdus iliacus</i>)	Amber List	Common winter visitor	Spread throughout the Site, mostly close to hedgerows.	0	14
Song thrush (<i>Turdus philomelos</i>)	Amber List S.41 (NERC)	Common resident	Recorded near hedgerow at south-eastern side of the Site.	1	0
Fieldfare (<i>Turdus pilaris</i>)	Red List	Very common winter visitor	Found mostly around hedgerows in the northern half of the Site.	1	9
Wren (<i>Troglodytes troglodytes</i>)	Amber List	Very common resident	Recorded in the northern arable fields.	0	1
Lapwing (<i>Vanellus vanellus</i>)	Red List S.41 (NERC)	Once common but declined resident	Mostly found in the southern half or central area of the site's arable fields.	0	3

Table EDP A3.2: Birds on the Green List and Non-native Species Observed within the Site

Species	Scientific Name
Long tailed tit	<i>Aegithalos caudatus</i>
Buzzard	<i>Buteo buteo</i>
Goldfinch	<i>Carduelis carduelis</i>
Carrion Crow	<i>Corvus corone</i>
Jackdaw	<i>Corvus monedula</i>
Blue tit	<i>Cyanistes caeruleus</i>
Robin	<i>Erithacus rubecula</i>
Chaffinch	<i>Fringilla coelebs</i>
Pied wagtail	<i>Motacilla alba</i>
Great tit	<i>Parus major</i>
Magpie	<i>Pica pica</i>
Green woodpecker	<i>Picus viridis</i>
Black bird	<i>Turdus merula</i>

- A3.7 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 moderate for a site of this size and abundance of species present is considered to be typical of a site of this size and type.
- A3.8 Although species of conservation concern are present, they are generally present in low numbers and the habitat is not considered likely to be of vital importance to these species.
- A3.9 Many of the species recorded, although they are Red-listed for countrywide declines, are still abundant nationally. The majority of species of conservation concern were concentrated along the hedgerows and scrub habitat, although linnets, meadow pipit and redwing were recorded within the arable and grassland fields. The farmland species recorded in the open areas of the Site tend to flock during the winter months. The numbers recorded were moderate. With this in mind, along with the abundance of suitable habitat across the wider landscape, the populations present are considered to be of Local level importance.

Breeding Bird Survey

Methodology

- A3.10 Breeding bird surveys were undertaken with reference to a standard methodology, entailing a modified Common Bird Census ‘territory mapping’ approach¹². This involves the completion of three survey visits, undertaken between approximately mid-April and early-July, i.e., at the height of the breeding bird season for lowland Britain. Three initial surveys took place during the 2017 period and a single update survey took place during the 2021 period. Three further surveys were undertaken during spring 2022.

¹² British Trust for Ornithology, Common Bird Census. www.bto.org.

A3.11 With reference to best practice, three survey visits were undertaken between April and June. The visits are timed to start around first light to coincide with the period of peak activity for birds, most particularly passerine songbird species. All survey visits were undertaken during suitable weather conditions with no strong wind or rain as shown in **Table EDP A3.3**, therefore these visits are not considered to have been significantly limited by seasonal or climatic factors.

Table EDP A3.3: Timing and Weather Conditions of the Breeding Bird Survey Visit

Visit	Date	Time	Precipitation	Wind (Beaufort)	Visibility
1	05/05/17	05:30	Nil	0-3	Good
2	01/06/17	05:10	Nil	0-1	Good
3	23/06/17	05:00	Nil	1-3	Good
4	01/06/21	04:25	Nil	2-3	Good
5	05/04/22	06:45	Nil	2-4	Good
6	17/05/22	Data lost			
7	09/06/22	05:00	Nil	1-2	Very Good

A3.12 In common with the Common Bird Census, the survey methodology involved walking to within 50m of all parts of the Site and recording all bird species present 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.

A3.13 Following the completion of the survey, the breeding status of each bird species identified was determined according to the nature and frequency of the behavioural elements recorded, as set out in **Table EDP A3.4**.

Table EDP A3.4: Summary of Field Evidence used to Determine Breeding Bird Status

Status	European Bird Census Council (EBCC) Criteria for Categorisation of Breeding Status
Confirmed	<ul style="list-style-type: none"> • 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; and • Nest with young seen or heard.

Status	European Bird Census Council (EBCC) Criteria for Categorisation of Breeding Status
Probable	<ul style="list-style-type: none"> • 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; and • Nest building or excavating nest-hole.
Possible	<ul style="list-style-type: none"> • Species observed in breeding season in possible nesting habitat; and • Singing male(s) present (or breeding calls heard) in breeding season.
Non-breeder	<ul style="list-style-type: none"> • Feeding birds only; • Birds flying over only; and • Lack of suitable breeding habitat.

A3.14 The survey was carried out by experienced ornithologists at an appropriate time of year for the locality and in suitable weather conditions.

A3.15 An assessment of the individual bird species recorded, 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 Birds of Conservation Concern¹³ Report.

Limitations

A3.16 Three surveys were carried out in 2022 but the data from the survey undertaken in May was lost. Anecdotally, the survey results were broadly in line with those recorded during April and June. Therefore, it is considered that the two surveys are representative of the Site’s breeding bird population when taking into account the data from previous years. A single yellow wagtail was recorded during the May survey, and this species is therefore considered to be possibly breeding within the Site.

¹³ Stanbury, A., Eaton, M., Aebischer, N., Balmer, D., Brown, A., Douse, A., Lindley, P., McCulloch, N., Noble, D., and Win I. (2021) The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain. *British Birds* 114: 723-747.

A3.17 Since the surveys undertaken in 2017, some birds have been moved from the Green list to the Amber or Red lists, such as wren and woodpigeon. During 2017, species listed on the Green list were recorded on first occurrence only, meaning that their population is likely under-represented in the results. These species are still common and widespread, and their occurrence has been recorded fully within 2022 surveys. The survey data is therefore not considered to be limited.

Results

A3.18 Detailed results of the birds recorded within the Site are provided in **Tables EDP A3.5** and **A3.6** and displayed on **Plans EDP 9-11**.

A3.19 During the survey visits in 2022, 45 species were recorded within the Site. Of the 45 species recorded, 30 were either listed on the Green List of Birds of Conservation Concern or not listed at all (those species considered non-native to the UK). One of the Green List species (red kite) recorded is on Schedule 1 of the *Wildlife and Countryside Act* (1981, as amended) and is recorded as possibly breeding.

A3.20 Of the remaining 15 species, 8 are listed on the Red List and 7 on the Amber List. Of those on the Amber list, two species were recorded as confirmed breeding (song thrush and dunnock), three as possibly breeding (whitethroat, mallard and meadow pipit) and two as probably breeding (wren and wood pigeon). Of those on the Red List, three species were recorded as confirmed breeding (Linnet, skylark and starling), one recorded as probably breeding (yellowhammer) and four as possibly breeding (greenfinch, house sparrow, tree sparrow and house martin).

A3.21 Nine listed species previously recorded in 2017 were not observed during the 2022 surveys. Three of these are on the Red List and six are on the Amber List. Of those on the Amber list, one species was recorded as confirmed breeding (reed bunting), one species as possible breeding (bullfinch), one species as probably breeding (stock dove) and three as unknown due to being on the green list at the time of survey and therefore only the first occurrence was recorded (sparrow hawk, moorhen and rook). Of those on the Red List, one species was recorded as confirmed breeding (yellow wagtail), one as probably breeding (lapwing) and one as non-breeding (swift).

A3.22 Yellow wagtail were recorded on a 2022 visit but was part of the lost data. It is considered that the species is possibly breeding on site.

A3.23 Barn owl (Schedule 1) is possibly breeding on site and tawny owl (Amber list) is also likely breeding on site despite not having been recorded during the surveys. This is due to surveys being carried out at a time when owls are not active.

A3.24 The habitat supports a mostly typical and widespread assemblage of lowland farmland breeding birds with a few locally significant populations. Due to the range of species and numbers recorded within the Site the breeding bird population is considered to be of District level importance.

Table EDP A3.5: Bird Species on the Schedule 1, Red and Amber List Recorded During the Breeding Bird Surveys within the Site

Species	National Status	On Site Status	Population within the Site (2017)	Population within the Site (2021)	Population within the Site (2022)
Sparrowhawk (<i>Accipiter nisus</i>)	Amber List	Present	Present on site but no population data collected.	None recorded during update survey.	None were recorded during the 2022 surveys.
Skylark (<i>Alauda arvensis</i>)	Red List S.41 (NERC)	Confirmed breeding	Singing male skylark were common across the arable land of the Site and were recorded across all survey visits. Juvenile skylarks were also recorded within family groups during the last survey visit. 8–14 pairs.	Seven singing individuals were recorded during the update survey. Likely similar in number compared to 2017.	Singing individuals and pairs of skylark were still common across the site. One possible nest was recorded. 12–14 pairs.
Mallard (<i>Anas platyrhynchos</i>)	Amber List	Possible breeding	None recorded during surveys.	None recorded during surveys.	A single individual was recorded during one of the 2022 surveys. 0–1 pair.
Meadow pipit (<i>Anthus pratensis</i>)	Amber List	Possible breeding	None recorded during surveys.	None recorded during surveys.	Ten individuals and a single pair was recorded during one survey. 2–4 pairs
Swift (<i>Apus apus</i>)	Red List	Non-breeding	Individual swifts and a small group of four were seen foraging over farmland habitat across all survey visits, although no evidence of a breeding colony was found.	None recorded during update survey.	None were recorded during the 2022 surveys.
Greenfinch (<i>Carduelis chloris</i>)	Red List	Possible breeding	Present on site but no population data collected.	None recorded during update survey.	A small number of pairs and singing individuals were recorded. 1–2 pairs.
Stock dove (<i>Columba oenas</i>)	Amber List	Probable breeding in 2017	A pair were recorded during the May survey flying into a hedgerow tree. 1–2 pairs	None recorded during update survey.	None were recorded during the 2022 surveys.

Species	National Status	On Site Status	Population within the Site (2017)	Population within the Site (2021)	Population within the Site (2022)
Wood pigeon (<i>Columba palumbus</i>)	Amber List	Probable breeding	Present on site but no population data collected.	None recorded during update survey.	Pairs of and individuals were commonly recorded within trees and hedgerows on site. 3-5 pairs
Rook (<i>Corvus frugilegus</i>)	Amber List	Present	Present on site but no population data collected.	None recorded during update survey.	None were recorded during the 2022 surveys.
House martin (<i>Delichon urbica</i>)	Red List	Possible breeding	None recorded during surveys.	None recorded during surveys.	A single individual was recorded during one of the 2022 surveys. 0-1 pair.
Yellowhammer (<i>Emberiza citrinella</i>)	Red list S.41 (NERC)	Probable breeding	Pairs of and individual yellowhammer were recorded fairly commonly across the Site, exclusively within arable hedgerows. They were also recorded regularly off-site to the east of St Frideswide's's Farm. 5-8 pairs.	Two individuals recorded singing and others seen on or just off-site. Suggests there has been little change in numbers since 2017.	Pairs of and individuals were still commonly recorded across the Site. Numbers recorded suggest there has still been little change in numbers. 5-8 pairs.
Reed bunting (<i>Emberiza schoeniclus</i>)	Amber List S.41 (NERC)	Confirmed breeding in 2017	Recorded on two survey visits within arable land directly to the south of Water Eaton park and ride, with individuals recorded on one occasion. 2-3 pairs.	None recorded during update survey.	None were recorded during the 2022 surveys.
Moorhen (<i>Gallinula chloropus</i>)	Amber List	Present	Present on site but no population data collected.	None recorded during update survey.	None were recorded during the 2022 surveys.
Linnet (<i>Linaria cannabina</i>)	Red List S.41 (NERC)	Confirmed breeding	Recorded commonly across the south-eastern part of the Site, within arable hedgerows, in pairs and individually. One	Are still common on site with at least nine recorded during the update survey.	Still recorded commonly across the Site but in slightly lower number than 2017. One active nest was recorded. 4-6 pairs.

Species	National Status	On Site Status	Population within the Site (2017)	Population within the Site (2021)	Population within the Site (2022)
			pair was recorded with juveniles. 6–8 pairs.		
Red kite (<i>Milvus milvus</i>)	Green List Schedule 1	Possible breeding	Individuals were seen hunting on multiple occasions. Mature trees suitable for breeding are present across the Site. 1–2 pairs.	One individual recorded flying over the Site.	Individuals were seen in similar numbers compared to previous surveys. 1–2 pairs
Yellow wagtail (<i>Motacilla flava</i>)	Red List S.41 (NERC)	Confirmed breeding in 2017. Possibly breeding as of 2022	Although yellow wagtail were seen only on one survey visit, a pair was seen converging on a single point with food items, suggesting the presence of a nest, within the field immediately to the north-west of St Frideswide's's Farm. 1–2 pairs.	None recorded during update survey.	A single individual was recorded during the May survey visit circling a potential nest site in the far north of the Site.
House sparrow (<i>Passer domesticus</i>)	Red List S.41 (NERC)	Possible breeding	None recorded during surveys.	No population data available - was on Green list at the time of survey.	A single individual was recorded during one of the 2022 surveys. 0–1 pair.
Tree sparrow (<i>Passer montanus</i>)	Red List S.41 (NERC)	Possible breeding	None recorded during surveys.	None recorded during surveys.	A single individual was recorded during one of the 2022 surveys. 0–1 pair.
Dunnock (<i>Prunella modularis</i>)	Amber List	Confirmed breeding	Dunnock were abundant particularly within denser boundary vegetation and scrub. Young were recorded during the final survey visit. 10–19 pairs.	Two individuals were recorded. Low numbers compared to 2017 could suggest a reduction in pairs.	Dunnock were regularly recorded across the Site. The numbers recorded were higher than in 2021 survey but still lower than the 2017 surveys. 4–7 pairs.

Species	National Status	On Site Status	Population within the Site (2017)	Population within the Site (2021)	Population within the Site (2022)
Bullfinch (<i>Pyrrhula pyrrhula</i>)	Amber List S.41 (NERC)	Possible breeding in 2017	A pair were recorded just off-site to the east of the arable land. 1–2 pairs.	None recorded during update survey.	None were recorded during the 2022 surveys.
Whitethroat (<i>Silvia currica</i>)	Amber List	Possible breeding	None recorded during surveys.	Five singing individuals recorded.	Eight singing individuals were recorded, mostly along the eastern hedgerows, during one of the 2022 surveys. 3–5 pairs.
Starling (<i>Sturnus vulgaris</i>)	Red List S.41 (NERC)	Confirmed breeding	Starlings were recorded just once off-site during May, a group of six, and once on-site during the final survey in June. However, during the final survey visit, juveniles were recorded alongside the adults. 1–2 pairs.	None recorded during update survey.	A group of ten individuals was recorded on one of the surveys. This is similar to the 2017 findings and suggests the population size has not changed. 1–2 pairs.
Wren (<i>Troglodytes troglodytes</i>)	Amber List	Probably breeding	Present on site but no population data collected.	None recorded during update survey.	Individual singing wren were recorded fairly commonly during the surveys and a single pair was observed. 3–5 pairs
Song thrush (<i>Turdus philomelos</i>)	Amber List S.41 (NERC)	Confirmed breeding	Song thrushes were recorded regularly across all three survey visits, particularly within mature vegetation at the side of Oxford Road. 2–4 pairs.	Two individuals recorded on site. One singing individual was recorded just off-site.	Singing individuals were still regularly recorded. There is possibly a slight increase in numbers since 2017. 4–6 pairs
Lapwing (<i>Vanellus vanellus</i>)	Red List S.41 (NERC)	Probable breeding in 2017.	A group of five individuals were recorded during the first survey visit within suitable arable habitat. 2–3 pairs.	None recorded during update survey.	None were recorded during the 2022 surveys.

Table EDP A3.6: Summary of Bird Species Recorded Which Are Not Considered to Be of Conservation Concern (Stanbury, A., 2021)

Species	Local Status
Long-tailed tit (<i>Aegithalos caudatus</i>)	Common resident
Red-legged Partridge (<i>Alectoris rufa</i>)	Very widespread resident
Grey heron (<i>Ardea cinerea</i>)	Locally numerous resident
Little owl (<i>Athene noctua</i>)	Declining resident
Buzzard (<i>Buteo buteo</i>)	Fairly common breeding resident following rapid colonisation
Goldfinch (<i>Carduelis carduelis</i>)	Common resident
Treecreeper (<i>Certhia familiaris</i>)	Fairly common resident, found mostly in association with mature trees
Feral pigeon (<i>Columba livia</i>)	Numerous resident
Carrion crow (<i>Corvus corone</i>)	Very numerous resident and increasing
Jackdaw (<i>Corvus monedula</i>)	Numerous resident
Blue tit (<i>Cyanistes caeruleus</i>)	Abundant throughout county
Great Spotted Woodpecker (<i>Dendrocopus major</i>)	Numerous resident, apparently maintaining good numbers
Robin (<i>Erithacus rubecula</i>)	Very common and familiar resident
Common chaffinch (<i>Fringilla coelebs</i>)	Abundant resident
Eurasian jay (<i>Garrulus glandarius</i>)	Common in woodlands and extending its range
Barn swallow (<i>Hirundo rustica</i>)	Numerous summer visitor
Pied wagtail (<i>Motacilla alba</i>)	Common breeding resident
Great tit (<i>Parus major</i>)	Abundant resident
Coal Tit (<i>Parus ater</i>)	Locally common resident, most frequently in woods with conifers
Pheasant (<i>Phasianus colchicus</i>)	Common in all non-urban habitats
Chiffchaff (<i>Phylloscopus collybita</i>)	A common breeding species
Magpie (<i>Pica pica</i>)	Common, but may have plateaued after recent increase
Green woodpecker (<i>Picus viridis</i>)	Fairly common resident

Species	Local Status
Goldcrest (<i>Regulus regulus</i>)	Common resident, often associated with coniferous trees
Collared dove (<i>Streptopelia decaocto</i>)	Very numerous resident
Blackcap (<i>Sylvia atricapilla</i>)	Most common breeding <i>Sylvia</i> warbler
Common whitethroat (<i>Sylvia communis</i>)	A common summer visitor, widely distributed throughout county in open habitat and roadside hedgerows
Lesser whitethroat (<i>Sylvia curruca</i>)	A common summer visitor, widely distributed throughout county
Blackbird (<i>Turdus merula</i>)	Abundant and ubiquitous resident

Annex EDP 4 Bat Surveys

Introduction

- A4.1 The Extended Phase 1 Habitat survey noted that trees and buildings within the Site had the potential to support roosting bats and the hedgerows, scrub and grassland habitats had the potential to support foraging and commuting bats.
- A4.2 The following surveys for bats were therefore undertaken in 2017, 2019 and 2021 with reference to national best practice guidelines¹⁴:
1. Investigations of bat roosting:
 - (a) Preliminary ground-level roost assessment of buildings for bat roosting potential;
 - (b) Emergence and re-entry surveys of buildings;
 - (c) Preliminary ground-level roost assessment of trees for bat roosting potential.
 2. Investigations of bat foraging/commuting activity:
 - (a) Manual transect surveys; and
 - (b) Automated detector surveys.

Methodology

Investigations for Roosting Bats

Visual Ground-level Assessment of Buildings

- A4.3 A visual assessment of all buildings on-site for the potential to support bats was undertaken by a Natural England bat licensed ecologist on 24 June 2021, with reference to national best practice guidelines¹⁵.
- A4.4 All external features considered potentially suitable for bats were assessed, using a high powered torch, and binoculars and endoscope where necessary, from all aspects, where accessibility allowed. In addition, an internal inspection of all accessible loft voids was undertaken. Suitable roost features in buildings include:
- Cracks/crevices in stone/brickwork/timber;

¹⁴ Hundt, L. (2012). *Bat Surveys: Good Practice Guidelines, 2nd Edition*. Bat Conservation Trust, London

- 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

A4.5 Signs of bat activity searched for include:

- Bats present (live, dead or skeletons);
- Droppings;
- Feeding remains, such as clusters of moth/butterfly wings and beetle wing cases;
- Urine staining below a potential access point/feature;
- Oily marks (staining) around potential roost access point/feature;
- Audible squeaking from behind roofing felt or timber boarding (particularly on a warm summer afternoon); and
- Large/regularly used roosts may produce an odour.

A4.6 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.

A4.7 The buildings were also assessed for evidence of use by barn owls, searching for signs of use, such as: droppings, feathers and pellets or for the presence of roosting/nesting birds

or nest debris. The results of this assessment are presented under the breeding bird results.

Emergence and Re-entry

- A4.8 Emergence and re-entry surveys of all buildings within the Site boundary that were determined to have potential to support roosting bats were carried out between August and September 2021.
- A4.9 In accordance with best practice guidelines, the dusk surveys commenced 15 minutes prior to sunset and continued for approximately 1.5 hours. The dawn re-entry surveys were commenced approximately 1.5 hours prior to sunrise and concluded 15 minutes after sunrise. Surveys were undertaken at an optimal time of year for identifying bat roosts (May to September) and the weather conditions were optimum for undertaking bat surveys, being relatively warm, with little wind and no rain. The survey findings are therefore considered to not be limited by seasonal or climatic factors.
- A4.10 The exact dates, timing and weather conditions of every survey undertaken are provided in **Table EDP A4.1**, which should be read in conjunction with **Plan EDP 1**, which shows the building reference numbers and their locations.

Table EDP A4.1: Timing and Weather Conditions of Emergence and Re-entry Surveys.

Building Name and Ref	Survey	Date	No. Surveyors	Timing	Sunrise/sunset	Temp. (°C)	Cloud (%)	Rain	Wind (Beaufort)
P1, P2, B3, P4, B5	Dusk Emergence	11/08/21	7	20:21 - 22:06	20:36	17-19	80-100	Nil	1
Frideswide's Barns F1, F2, F3	Dusk Emergence	24/08/21	6	19:50 - 21:38	20:05	22	0	Nil	3
P1, P2, B3, P4, B5	Dawn Emergence	25/08/21	6	04:05 - 06:20	06:05	15	100	Nil	0-2
Frideswide's Barns F7, F8	Dusk Emergence	01/09/21	6	19:38 - 21:23	19:53	16-18	100	Nil	1-2
Frideswide's Barns F1, F2, F3	Dusk Emergence	06/09/21	6	19:25 - 21:10	19:40	24-25	0-20	Nil	0-2
Frideswide's Barns F7, F8	Dawn Emergence	17/09/21	6	05:12 - 06:42	06:42	14	70-90	Nil	0-2
Frideswide's Barns F1, F2, F3	Dawn Emergence	22/09/21	6	05:19 - 07:04	06:49	11-13	0	Nil	0
B3, B5 Frideswide's Barns F4, F5, F6, F Lean-to	Dawn Emergence	29/09/21	8	5:30 - 07:17	07:02	7-13	0-10	Nil	0-5
Frideswide's Barns F8	Dusk Emergence	29/09/21	4	18:35 - 20:20	18:50	11-13	0	Nil	1

Roost Assessment of Trees for Bat Roosting

A4.11 A visual assessment of all trees within the Site was undertaken in 2017 and an updated visual assessment of the trees within the orchard was undertaken in 2021, to assess their potential to support roosting bats. All surveys were completed by a Natural England bat licensed ecologist. In addition, any direct evidence of bats was also searched for.

A4.12 All external features considered potentially suitable for bats were assessed using a high-powered torch, from all aspects, where accessibility allowed.

A4.13 Suitable features on trees 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.

A4.14 Signs of roosting bats include:

- Bat(s) roosting *in situ*;
- 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.

A4.15 On this basis, the trees assessed were assigned a rating of potential suitability for roosting bats, from negligible to confirmed roost, in accordance with current best practice guidance (Collins, 2016)¹⁵ as follows:

- Confirmed roost: Evidence of roosting bats found;

¹⁵ Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (3rd Edition). Bat Conservation Trust, London.

- High potential: The tree includes many potential bat roost features;
- Moderate potential: The tree includes few potential bat roost features;
- Low potential: The tree includes one potential bat roost feature; and
- Negligible potential: The tree is not considered suitable for bats.

Limitations

A4.16 Bat tree assessments can be undertaken at any time of year but are best undertaken in winter months when the trees are not in leaf. Trees were coming into leaf when the surveys were undertaken; however, the view of the trees were not obscured fully and trees could be fully inspected by looking from several angles, therefore this is not deemed to have significantly impacted upon the findings.

Investigations of Bat Foraging/Commuting Activity

Manual Transect Surveys

A4.17 Manual transect surveys were undertaken in 2017, 2021, and 2023 to identify the diversity of bat species using the Site, their relative distribution and abundance and any key foraging/commuting routes. Best practice guidance¹⁶ recommends that for a site with moderate habitat suitability, one survey visit per month between April to October be undertaken.

A4.18 Full details including the date, timing, and weather conditions of the transect surveys undertaken are given in **Table EDP A4.2**. Weather conditions were considered optimal for most of the bat surveys, being relatively warm with light to medium winds and no rain.

Table EDP A4.2: Date, Timing and Weather Conditions of 2017 and 2021 Bat Transect Surveys.

Survey Date	Dusk/ Dawn	Survey Time	Sunrise/ Sunset Time	Weather Conditions			
				Temp (°C)	Cloud (%)	Rain	Wind (Beaufort scale)
24/04/17	Dusk	20:15- 22:18	20:18	6.1- 8.0	10-60	Nil	2-3
22/05/17	Dusk	21:02- 23:08	21:02	18.3- 20.1	40	Nil	4
22/06/17	Dusk	21:28- 23:30	21:28	17.1- 19.9	70-80	Nil	1-3
25/07/17	Dusk	21:04- 23:04	21:04	20-21	60-80	Nil	2-3
26/07/17	Dawn	03:14- 05:18	05:18	15-16	20-50	Nil	1-2

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

Survey Date	Dusk/ Dawn	Survey Time	Sunrise/ Sunset Time	Weather Conditions			
				Temp (°C)	Cloud (%)	Rain	Wind (Beaufort scale)
22/08/17	Dusk	20:13– 22:13	20:13	18–21	100	Nil	1–3
25/09/17	Dusk	19:00– 21:00	18:56	15–16	60–80	Nil	0
27/05/21	Dusk	21:10– 23:10	21:10	13–17	20–30	Nil	0–2
14/07/21	Dusk	21:17– 23:17	21:17	16–22	0	Nil	1–2
15/07/21	Dawn	03:04– 05:04	05:04	15–16	0–5	Nil	1–2
07/09/21	Dusk	19:40– 21:40	19:40	22–25	0	Nil	0–1
26/09/23	Dusk	18:55– 21:05	18:55	16–19	75	Nil	1

A4.19 Manual transect surveys were completed by experienced bat surveyors across one (2017 and 2023) or two (2021) transect survey routes designed to provide a representative cover of potential foraging or commuting habitats within or immediately adjacent to the Site, including grassland fields, hedgerows, streams and woodland. The transect routes are illustrated on **Plan EDP 4**.

A4.20 Transects were walked at a slow and steady pace using equally spaced ‘pacing points’ to ensure an equal time was taken in each area of suitable habitat. 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.

A4.21 Surveyors used 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 (BatExplorer) to confirm species identification. Species of *Myotis* bat and long-eared bat are difficult to identify solely from their echolocation calls and were therefore grouped as such.

A4.22 The GPS data from the detectors were used to plot the identified bat recordings along with any flight paths of bats that were seen. This is illustrated on **Plans EDP 12–22**.

Limitations

A4.23 Access was not fully arranged to the Site prior to the April 2017 activity survey, and as such, the surveyor used public footpaths to complete a survey of the area. This did not take in all field boundaries but was sufficient to give a snapshot of bat activity around the Site for the night in question. This is not considered to have affected the ability to form an assessment of the Site’s bat activity when studied in conjunction with survey data from other months across the active season.

A4.24 The temperature on the April survey was below the optimal temperatures for bat surveys but given that further 11 surveys were undertaken, it is not considered to have influenced the overall findings.

Automatic (Static) Detector Surveys

A4.25 To supplement the manual transect survey data, bat activity within the Site was also sampled using automated bat detectors that automatically trigger and record bat echolocation calls. Automated detectors were deployed within the Site during May to September in 2017, 2019, 2021, and 2023.

A4.26 Two Anabat Express bat detectors were deployed during the sampling period in varying locations in 2017 and consistent locations in 2019 and 2021; in 2023, two Anabats Swifts were deployed in the replicable locations used in 2019 and 2021. The locations are shown on **Plan EDP 4**. The Anabats were fixed in secure locations, with an external microphone attached approximately 1.5m above-ground and directed away from the boundaries to maximise detection sensitivity. **Table EDP A4.3** gives the location details for the Anabats.

Table EDP A4.3: Anabat Location Details

Location	Adjacent/Nearby Habitat	Microphone	
		Height (m)	Direction
1	Arable	1.5	South
2	Arable	1.5	East
3	Arable, broad leaved woodland	1.5	North
4	Arable	1.5	North
5	Arable	1.5	South-west
6	Arable	1.5	South-west
7	Arable	1.5	South
8	Arable	1.5	South-east
9	Arable	1.5	South-west
10	Arable	1.5	North-east
11	Arable, woodland	1.5	West
12	Arable	1.5	South-east
13	Arable	1.5	East
14	Arable	1.5	South

A4.27 The echolocation calls recorded by the Anabats Express were filtered for noise files (i.e., sound files created when background noise triggers the Anabat 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 that proposed by Chris Corben and Kim Livengood¹⁷ and are provided in **Table EDP A4.4**. All files passing the various filters were checked manually using sonogram analysis (AnalookW) in accordance with published parameters¹⁸ to confirm the species identification of each bat call.

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

Table EDP A4.4: Filtration Values Used by Analoook Software to Remove Noise Files

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

A4.28 The echolocation calls recorded by the Anabats Swifts were filtered using the BatClassify plugin to Auto ID each call using Anabat Insight software (version 1.9.9). The certainty threshold was set at 50% and bat calls from the following species: Nathusius' pipistrelle (*Pipistrellus nathusii*), noctule (*Nyctalus noctula*), Leisler's bat (*Nyctalus leisleri*), serotine (*Eptesicus serotinus*) greater horseshoe bat, lesser horseshoe bat, long-eared bats (*Plecotus sp.*) and myotis bats (*Myotis sp.*) were manually checked in Insight. A randomised 10% sample of the noise files were also manually checked.

Limitations

A4.29 The identification of calls and species using Analoook software is dependent upon the quality of the recording made, which can be influenced by the following factors that may limit levels of activity and species recorded:

- Weather conditions – rainfall and wind;
- 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.

A4.30 None of the activity surveys completed during 2017, 2019, 2021 or 2023 were constrained by unseasonably cold or wet conditions.

A4.31 Species of *Myotis* bat are difficult to identify solely from their echolocation calls and were therefore grouped together. It is not possible to differentiate between the two species of long-eared bat based on their echolocation calls; these calls are therefore also grouped together.

A4.32 Certain species of bat can also be over- or under-recorded owing to their foraging and commuting behaviour, the ability to detect their echolocation on standard bat detectors and/or discern it from other species; for example, brown long-eared bats are often under-recorded owing to their quiet echolocations.

A4.33 The limitations outlined above are largely inherent and have been factored into the valuation of the assemblage present.

Results

Investigations of Bat Roosting

Ground-level Visual Assessment of Buildings

A4.34 The results of the preliminary internal/external inspections of buildings located within the Site are illustrated on **Plan EDP 1**. The assessment identified a number of buildings with moderate to high potential to support roosting bats. The value of each of the buildings within the Site for roosting bats is summarised within **Table EDP A4.5**.

Table EDP A4.5: Preliminary Bat Roost Assessment of Buildings

Building ID/No.	Description	Evidence of Bats/Roosting Potential
F1	Stone barn with asbestos sheet roof. Timber support beams and open gable roof. Two storeys.	Confirmed. Bat droppings found. Ridge and furrow gaps and gaps in eaves. Gaps by door lintel, in mortar and in exposed timbers/purlins.
F2	Stone barn with slate roof and large timber doors. Open gable shaped roof.	High. Access above main door. Slate roof has multiple access points with missing and raised tiles. Possible crawl spaces in ventilation slats. Open eaves on gable and cracks in stonework.
F3	Open gable wooden clad roof with single dormer window. Breeze block walls. Double and single timber door access. Two storeys.	Confirmed. Bat dropping found in 1 st storey. Access through apex and cladding of dormer window and breeze block cracks.
F4	Breeze block walls with large double metal doors and shed shaped asbestos roof.	Low.
F5	Breeze block walls with asbestos sheeting and timber roof supports. Shed shaped roof	Low. Gap between fascia, sheet furrows and eaves.
F6	Ivy covered stone brick walls. Open sided with timber supports and an open gable roof.	Low. A few gaps on the timber cladding.
F7	Red brick derelict barn. Empty window and door frames. Timber roof frame, slate roof. Intact lean-to.	Negligible.
F7 Lean-to	Red brick walls with slate roof, empty window frame. Shed shaped roof.	Moderate. Some warped timber providing access.

Building ID/No.	Description	Evidence of Bats/Roosting Potential
F8	Stone brick barn with timber supported metal sheet open gable roof. Window frames are missing glass. Large open entrance.	Moderate. Some mortar gaps, slate roof with many gaps and raised tiles. Open window access into main building.
F9	Open sided metal Dutch barn. Metal framed.	Negligible.
F Lean-to	Wooden clad walls and breeze block walls, open sided. Shed shaped plastic roof.	Low. Gaps in cladding.
P1	Open sided stone barn with asbestos sheet roof. Double ridge beam and queen post timber roof frame.	Low. Some large holes in wall.
P2	Stone barn with pitched asbestos sheet roof and timber beams. Joined to roof of P1. Open doors. Triple ridge board and king post roof shape.	Low. Gaps around boarded window. Some deep running holes in stonework.
P4	Stone extension to B5. Stone walls with asbestos sheet roof and timber doors.	Low
P Lean-to	Stone wall, asbestos sheet shed shaped roof. Open door frame.	Low
B3	Stone extension to B5. Stone walls, asbestos sheet roof and timber doors. 1 ½ storeys.	Low Raised roof panels, ridge tile gap at the end of the gable and slight gap above door.
B5	Half brick, half-timber cladding with large double timber doors. Two storeys. Slate roof.	Moderate Large gaps in timber cladding, partially blocked eaves, and lots of raised or missing ridge tiles on roof.

Emergence/Re-entry Surveys

- A4.35 All buildings/structures with moderate to high bat roost potential, and at risk of potential adverse impacts from the proposed development, were subject to detailed emergence and re-entry surveys. Five of the buildings on site had observed emergences or re-entries during the surveys. The details of these are summarised within **Tables EDP A4.6 and A4.7.**
- A4.36 F8 was found to support a roost of a single bat of an undetermined species. Due to bat activity in the surrounding area recorded during surveys of the building, it is likely that the roost is of a pipistrelle species.

Table EDP A4.6: Results of the Emergence and Re-entry Surveys

Building No.	Visual Assessment	Detailed Emergence/Re-entry Surveys						Maximum Roost Count
		Date	First Dusk Emergence Survey	Date	Dawn Re-entry Survey	Date	Second Dusk Emergence survey	
F1	Confirmed	24/08/21	0	22/09/21	0	06/09/21	1 S.pip	1
F2	High	24/08/21	1 C. pip	22/09/21	0	06/09/21	0	1
F8	Moderate	01/09/21	1 undetermined	17/09/21	0	29/09/21	0	1
B3	Low	11/08/2021	1 C.pip	25/08/21	0	29/09/21	0	1
B5	Moderate	11/08/2021	1 S.pip	25/08/21	1 S.pip, 2 C.pip	29/09/21	0	3

Table EDP A4.7: Emergence and Re-entry locations

Building No.	Location of Emergences/ Re-entries
F1	Gap in middle of brick wall on the east facing elevation.
F2	Slit shaped window on the top left of the east facing.
F8	Open window frame on the north-west facing.
B3	North-east corner, next to the lean-to.
B5	East side wall close to apex and top right of the ivy covered southern facing wall.

Preliminary Ground Level Assessment of Trees

A4.37 During the preliminary ground level assessment of trees for roosting bats undertaken in 2017 and 2021, no bats or evidence of bats was found from ground level at the time of the assessment. However, in 2017 there were six trees found to have high bat roost potential, seven with moderate bat roost potential and two with low bat roost potential. In 2021 there was eight trees found to have high roost potential, ten with moderate and two groups of trees with low potential. These are illustrated on **Plan EDP 1**. Full details of all the trees that had bat roost potential are provided in **Table EDP A4.8**.

Table EDP A4.8 Bat Tree Assessment Results

Tree ID (Plan EDP 1)	Bat Roosting Potential	Species	Description
T1	Moderate	Ash	Single limb hole with small cavity.
T2	High	Ash	Large cavity in trunk.
T3	Moderate	Ash	Split in limb.
T4	High	Ash	Woodpecker hole at 7m on north aspect. Some smaller splits, and fungus growth indicating decay.
T5	Moderate	Horse chestnut	Splits and cracks left by falling limbs.
T6	Moderate	Ash	Cavity in trunk and lots of hollow limbs. Deadwood in crown.
T7	High	Oak	Cavity in trunk at 1m.
T8	Low	Oak	Dense ivy cover on trunk.
T9	Moderate	Oak	Splits in smaller limbs, probably more features not visible due to age of tree.
T10	High	Ash	Hollow trunk with lots of deadwood, multiple enclosed cavities.
T11	High	Ash	Woodpecker hole at 10m on S aspect. Other cavities in limbs, dense ivy.
T12	Moderate	Oak (dead)	Dead tree with flaking bark.
T13	Moderate	Oak (dead)	Dead tree with flaking bark.
T14	Low	Oak	Flaking bark around limb, dense ivy on trunk.
T15	High	Dead (unidentified)	Dead tree with multiple splits.
T16	Moderate	Oak	Thick ivy cover on main trunk. Limb tare out with possible cavity on southern elevation and potential cavity in main trunk.

Tree ID (Plan EDP 1)	Bat Roosting Potential	Species	Description
OT1	High	Apple (<i>Malus domestica</i>)	Split trunk with two large branch cavities.
OT2	Moderate	Apple	Leaning trunk with cavity.
OT3	High	Willow	Split mature trunk with cavity.
OT4	High	Dead (unidentified)	Woodpecker holes.
OT5	Moderate	Pear (<i>Pyrus</i> sp.)	Split trunk and two cavities in branches extending about 5cm each.
OT6	High	Pear	Hole at trunk base with cavities extending upwards. Some have openings at top.
OT7	High	Pear	Downwards cavities in the trunk and multiple upwards cavities on branches.
OT8	Moderate	Apple	Trunk split open leading to main horizontal branch.
OT9	Moderate	Apple	Hole in trunk extending into main leader stems where the cavities are open at the top.
OT10	High	Apple	One large cavity and one smaller on trunk.
OT11	Moderate	Apple	Two branches with small cavities.
OT12	Moderate	Apple	Small downward cavity on trunk.
OT13	High	Apple	Large cavity in trunk and some hollow branches.
OT14	Moderate	Apple	Small cavity in trunk.
OT15	High	Apple	Hole at base of trunk with a cavity leading up to branches.
OT16	Moderate	Apple	Large hole in a branch leading to a small cavity.
OT17	Moderate	Apple	Small hole on a knot.
OT18	Moderate	Apple	Three small holes in knots.
OG1	Low	Group of various species	No features producing roosting potential.
OG2	Low	Group of apple trees	No features producing roosting potential.

Investigations of Bat Foraging/Commuting Activity

Manual Transect Surveys

- A4.38 The distribution of bat activity around the Site recorded during the transect surveys is illustrated on **Plans EDP 12–22**.
- A4.39 Seven bat species/species groups were recorded during the transect surveys undertaken in 2017, with eight species/species groups recorded in 2021, and four species/species groups recorded in 2023. There was a total of nine different species/species groups calls recorded, namely common pipistrelle, soprano pipistrelle, *Myotis*, noctule, Nathusius' pipistrelle (*Pipistellus nathusii*), Barbastelle, Leisler's bat (*Nyctalus leisleri*), Long eared sp. (*Plecotus* sp.) and serotine (*Eptesicus serotinus*).

A4.40 Bat activity was mainly associated with the hedgerows and the woodland edge running along the western boundary. In particular, during the 2021 surveys, there was consistent high activity where the woodland edge meets H1. The northern most hedgerow that runs next to the park and ride also had a fairly consistent medium level of activity throughout the 2021 surveys while the southern half of the Site only had high levels of activity during the September dusk survey. During the 2023 survey, most activity was again found along the western boundary adjacent to the road, with the western treeline between H3 and H4 observing a high amount of common pipistrelle activity.

Automated Detector Surveys

A4.41 Full results of the automated detector surveys are set out in **Table EDP A4.9**.

Table EDP A4.9: Automated Detector Results

Location	Total Calls per Species Across Sampling Period									
	Common pipistrelle	Soprano pipistrelle	Myotis sp.	Noctule	Long eared bat	Serotine	Barbastelle	Nathusius' pipistrelle	Leisler' s bat	Total
03-07 May 2017										
3	15	10	5							30
4	3	1	2	1						7
Total	18	11	7	1						37
31 May-05 June 2017										
7	173	17	4							194
8	133	39	6	1			1			180
Total	306	56	10	1			1			374
16-21 June 2017										
11	84	35	13	55	4	1	5		1	198
12	137	61	28	34			3		2	265
Total	221	96	41	89	4	1	8		3	463
25-30 July 2017										
15	51	19		16	1					87
16	335	194	2	18						549
Total	386	213	2	34	1					636
17-21 August 2017										
19	1130	197	15	34	3					1379
20	82	39	21	10	1					153
Total	1212	236	36	44	4					1532
21-25 September 2017										

23	513	119	61	61			5			759
24	110	169	50	6	8			3		346
Total	623	288	111	67	8		5	3		1105
17-21 May 2019										
1	98	64	4	9	2		8			185
2	963	225	2	25	1					1216
Total	1061	289	6	34	3		8			1401
12-16 July 2019										
1	268	134	22	62	4		3			493
2	158	180	32	80	5	1				456
Total	426	314	54	142	9	1	3			949
12-16 August 2019										
1	69	45	39	20	10		31			214
2	393	127	20	238	23		3	1		805
Total	462	172	59	258	33	0	34	1	0	1019
27-31 May 2021										
1	86	1	24	26				1		138
2	32	13	7	3						55
Total	118	14	31	29	0	0	0	1	0	193
11-15 August 2021										
1	265	90	1	7		80		168		611
2	Detector Failed									0
Total	265	90	1	7	0	80	0	168	0	611
17-22 September 2021										
1	34	14	6	18		1				73
2	479	98	14			3				594
Total	513	112	20	18	0	4	0	0	0	667
21-26 September 2023										
1	124	55	29	104	4	1	22			
2	10	8	4	28	1		4			
Total	134	63	33	132	5	1	26			
Overall										
Total	5745	1954	411	856	67	87	85	173	3	9205
Percentage	62.41	21.23	4.46	9.30	0.73	0.95	0.95	1.88	0.03	

Summary of Bat Activity

A4.42 Species diversity at the Site is moderately high, with at least nine bat species/species groups (*Myotis* sp. and long-eared were not identified to species level) confirmed to be present foraging and/or commuting during the course of the surveys.

- A4.43 The majority of activity during the transect surveys related to boundary habitats including the hedgerows. Bat activity was evenly spread across the boundaries of the Site.
- A4.44 The abundance and diversity of species recorded is considered to be moderately high but fairly typical of an urban edge site in the south of England. The common and widespread generalist species, common pipistrelle and soprano pipistrelle, accounted for the vast majority of foraging and commuting activity.
- A4.45 The presence of a small number of rarer species, including the Annex II species barbastelle is not considered to be significant due to the lack of quality foraging or roosting habitat for either species. The lack of any barbastelle evidence in 2021 also suggests that there is no longer a population present.
- A4.46 Five roosts mostly containing a single bat of the common and widespread generalist species, common pipistrelle and soprano pipistrelle were confirmed.
- A4.47 Based on the findings of the surveys, the foraging/commuting bat assemblage is considered to be valuable at Local level.

This page has been left blank intentionally

Annex EDP 5 Reptile surveys

Methodology

- A5.1 To confirm the presence or likely absence of reptiles and the extent of their usage of the Site, detailed refugia-based reptile surveys were undertaken targeting the higher quality habitats. With reference to best practice guidance¹⁹, seven survey visits were undertaken in 2017. The approximate locations and numbers of reptile refugia is illustrated on **Plan EDP 5**.
- A5.2 During the detailed reptile surveys, a total of 56 artificial refugia comprising roofing felt sheets measuring approximately 1m x 0.5m were deployed within suitable reptile habitat across the Site on 08 May 2017. Reptile refugia were left undisturbed *in situ* for ten days prior to the commencement of the seven reptile surveys visits.
- A5.3 Detailed weather conditions recorded during each survey visit undertaken throughout 2017 are summarised in **Table EDP A5.1**.

Table EDP A5.1: Date, Timing and Weather Conditions of Reptile Surveys Undertaken During 2017

Date	Visit no.	Time	Temp (°C)	Wind (Beaufort)	Cloud cover (%)	Precipitation
05/06/17	1	10:20–13:00	13.8–14.4	3–4	90–100	Rain during final hour of survey.
16/06/17	2	11:15–12:30	19.0–21.5	0–2	0–30	Nil
22/06/17	3	17:03–19:16	21.2–23.0	1–3	40–70	Nil
04/07/17	4	09:45–11:30	16.0–18.0	1–2	95–100	Brief light drizzle.
25/07/17	5	18:00–19:30	21.0–23.0	1–3	60–80	Nil
04/08/17	6	13:00–14:30	18.4–19.2	1–2	90–95	Nil
17/08/17	7	12:00–15:45	15–19	2–4	0–10	Nil

- A5.4 During each survey visit, artificial refugia were individually checked by experienced ecologists with any reptiles observed recorded, along with notes on their life stage (adult/juvenile) and sex where possible.
- A5.5 A peak count of the total number of individuals of a particular species was recorded. Peak counts were then used to estimate approximate population size for each reptile species

¹⁹ Froglife (1999) *Reptile survey: an introduction to planning, conducting and interpreting surveys for snake and lizard conservation*. Froglife Advice Sheet 10, Froglife, Halesworth; DMRB (2005) *Nature conservation advice in relation to reptiles and roads. Volume 10, Section 4, Part 7, HA/116/05*. DMRB

recorded in accordance with published guidance²⁰ and are summarised in **Table EDP A5.2**.

Table EDP A5.2: Population Size Class Estimates.

Species	Population Size Estimate		
	Low	Medium	High
Slow worm	< 50/ha	>50/ha	> 100/ha
Common lizard	< 20/ha	>40/ha	> 80/ha
Grass snake	< 2/ha	2-4/ha	> 4/ha
Adder	< 2/ha	2-4/ha	> 4/ha

Limitations

A5.6 All reptile surveys were undertaken within recognised optimal months for reptile surveys. The temperatures of some of the surveys were above the maximum recommended survey temperature of 18 °C. Surveys 3 and 5, which recorded the highest temperatures, took place later on in the day when reptiles are more likely to be basking, so this is not thought to have adversely affected the survey results.

Results

A5.7 The results of the surveys are summarised in **Table EDP A5.3**. The locations which reptiles were recorded at are illustrated on **Plan EDP 23**.

Table EDP A5.3: Reptile Survey Results

Date	Visit No.	Grass Snake	
		Adult	Juvenile
05/06/17	1	1	2
16/06/17	2	-	-
22/06/17	3	-	-
04/07/17	4	-	-
25/07/17	5	-	-
04/08/17	6	-	-
17/08/17	7	-	-

A5.8 An adult grass snake and two juveniles were found in the Site just north of the farm buildings.

A5.9 The grass snake population is firmly within the small population bracket, with a peak count of just one adult. The grass snake population is considered to therefore be of Local level value.

²⁰ Herpetofauna Groups of Britain and Ireland (1998). *Evaluating Local Mitigation/Translocation Programmes: Maintaining Best Practice and Lawful Standards*. HGBI Advisory Notes for Amphibian and Reptile Groups (ARGs)

A5.10 Due to low levels of reptiles recorded in the 2017 surveys, it was determined that additional surveys in 2021 were not necessary.

This page has been left blank intentionally

Annex EDP 6 Great Crested Newt Surveys

Methodology

- A6.1 There are nine ponds located within 500m of the Site. None of which are located within the Site. A number of the ponds were discovered to be infilled or non-existent following liaison with the landowners or dried out in early spring. The locations of the ponds are illustrated on **Plan EDP 6**.
- A6.2 Pond 3, although within 500m, is located across Banbury Road, which acts as a dispersal barrier for newts and was therefore only surveyed once in 2017.
- A6.3 Ponds 4, 5, 6, 12 and 13 were initially surveyed in 2017 but are no longer within 500m of the Site and therefore not surveyed thereafter.
- A6.4 Initial surveys took place in 2017. An HSI assessment was undertaken on each pond in, to assess their suitability to support great crested newts. However, all ponds were then subject to further survey methods, which included bottle trapping, torching and egg searching, due to the presence of records within and around the Site.
- A6.5 Further update surveys were completed in 2019 and 2021 to determine if there had been any change in population levels, this consisted of eDNA tests of ponds.

Habitat Suitability Assessment

- A6.6 An assessment of the ponds' suitability to support populations of great crested newt using the standard HSI assessment developed by Oldham et al. (2000)²¹ was undertaken on 03 May 2017. This is a standard assessment system that is required as part of Natural England development licence and uses numerous criteria (such as water quality, fish/waterfowl presence and surrounding terrestrial habitat) from which a 'score' is derived. Waterbodies with higher scores are considered more likely to support great crested newt compared to those with low scores. HSI scores relating to the suitability of each waterbody to support great crested newt are described within **Table EDP A6.1**.

Table EDP A6.1: HSI Scores and Inferred Pond Suitability

HSI Score	Pond Suitability to Support Great Crested Newts
<0.5	Poor suitability
0.5 - 0.59	Below average suitability
0.6 - 0.69	Average suitability
0.7 - 0.79	Good suitability
> 0.8	Excellent suitability

²¹ Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). *Evaluating the suitability of habitat for the Great Crested Newt (Triturus cristatus)*. Herpetological Journal 10 (4), 143-155

Great Crested Newt Surveys

A6.7 Great crested newt surveys of the ponds were undertaken in May 2017 with reference to the survey methodology set out in the English Nature Guidelines²² by a holder of a Natural England great crested newt survey licence and an assistant. With reference to the guidelines, the following three preferred survey techniques were employed to determine the presence/absence of great crested newt on-site:

- **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 2-litre plastic bottles) that are inserted into the water along the margin of the waterbodies 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
- **Egg Searching:** A search of any suitable aquatic vegetation to check for great crested newt eggs.

A6.8 In addition, where one of these survey methods was not possible, nets were used. These were swept through likely inhabited areas of the pond and then checked for newt adults or efts, which were then re-released into the pond.

A6.9 The standard survey procedure involves a minimum of four survey visits to each pond to confirm the presence/likely absence of great crested newts. The dates and conditions for each of the survey visits are listed in **Table EDP A6.2**.

Table EDP A6.2: Dates and Overnight Temperatures of Survey Visits

Visit	Date	Overnight Temperature (°C)
1	02/05/17	9
2	08/05/17	8
3	16/05/17	14
4	23/05/17	14

Limitations

A6.10 It was not possible to bottle trap pond P2 due to the lining of the pond. It was not possible to trap pond P8 due to its concrete sides. Pond P9 dried up after the first survey so no further surveys were possible.

A6.11 The inability to trap Ponds P2 and P8 is not considered to have limited the efficacy of the survey, as the use of nets was substituted, meaning that three survey methods were still used.

²² English Nature (2001). Great Crested Newt Mitigation Guidelines, English Nature, Peterborough

eDNA Surveys

A6.12 Environmental DNA (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.

A6.13 Water samples were taken by a Natural England great crested newt licensed EDP ecologist, and an assistant, in accordance with the methodologies set out by the Freshwater Habitats Trust²³, 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; and
- 15ml of this mixed sample was then pipetted into each of the six conical tubes containing preserving fluid and each tube was shaken thoroughly to homogenise the sample. There are six tubes per waterbody.

A6.14 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).

A6.15 eDNA surveys were undertaken on 16 April 2019 and 27 April 2021.

Results

Habitat Suitability Assessment

Table EDP A6.3: HSI Scores for Each Pond that was Surveyed Within and Around the Site

Pond Number	HSI Score	Suitability to Support Great Crested Newt
P1	0.71	Good
P2	0.58	Below Average
P3	0.31	Poor
P8	0.66	Average
P9	0.46	Poor

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

Pond Number	HSI Score	Suitability to Support Great Crested Newt
P10	0.76	Good
P11	0.73	Good

Conventional Survey

A6.16 No great crested newt, their eggs or smooth newts were recorded during the surveys. **Table EDP A6.4** includes the detailed survey results for each pond surveyed.

Table EDP A6.4: Detailed Survey Results

Pond ID	Visit No.	No. Traps	Trap Results	Torch Results	Egg Search Results	Netting Results	Other Recordings
P1	1	13	Nil	Nil	Nil	N/A	Nil
	2		Nil	Nil	Nil	N/A	Common frog
	3		Nil	Nil	Nil	N/A	Nil
	4		Nil	Nil	Nil	N/A	Nil
P2	1	Survey method not used		Nil	Nil	Nil	Nil
	2			Nil	Nil	Nil	Nil
	3			Nil	Nil	Nil	Nil
	4			Nil	Nil	Nil	Nil
P3	1	40	Nil	Nil	Nil	Nil	Fish
	2		Nil	Nil	Nil	Nil	Tadpoles, fish
	3	Method not used due to high numbers of fish caught.		Nil	Nil	Nil	Nil
	4			Nil	Nil	Nil	Nil
P8	1	Survey method not used		Nil	Nil	Nil	Nil
	2			Nil	Nil	Nil	Bats, mallards, swans
	3			Nil	Nil	Nil	Nil
	4			Nil	Nil	Nil	Nil
P9	1	5	Nil	Nil	Nil	N/A	Nil
	2		Pond dried up				
	3						
	4						
P10	1	5	Nil	Nil	Nil	N/A	Nil
	2		Nil	Nil	Nil	N/A	Nil
	3		Nil	Nil	Nil	N/A	Nil
	4		Nil	Nil	Nil	N/A	Nil
P11	1	15	Nil	Nil	Nil	N/A	Nil
	2		Nil	Nil	Nil	N/A	Fish, mallards
	3		Nil	Nil	Nil	N/A	Nil
	4		Nil	Nil	Nil	N/A	Nil

eDNA Surveys

- A6.17 All tests came back negative for the presence of great crested newts, and therefore it was determined that there was no need for further surveys.

This page has been left blank intentionally

Annex EDP 7 Badger Survey

- A7.1 Badger walkover surveys were undertaken on 2015, 2017 and 12 May 2021, during which all field boundaries across the Site (where accessible) were searched for evidence of badger activity or setts by a suitably experienced ecologist.
- A7.2 During the survey, any signs of badger activity such as holes, latrines, trails, snuffle holes and hairs on fencing or vegetation were recorded. Where holes of a size and shape consistent with badgers were identified, the following signs of badger activity were searched for in order to determine whether they were currently in active use:
- Fresh spoil outside entrances;
 - Old bedding material (typically dried grass) outside entrances;
 - Holes being cleared of leaf litter;
 - Badger guard hairs; and
 - Fresh tracks leading to/from the holes.
- A7.3 Any badger sett found was examined and assigned to one of four categories²⁴, which have been used in the various National Badger Surveys²⁵, as detailed in **Table EDP A7.1**. The number of holes comprising each sett was recorded and each was classified as disused, partially used or well used by badgers as detailed in **Table EDP A7.2**.

Table EDP A7.1: Badger Sett Descriptions and Categories

Sett Descriptions
Main Setts: These usually have a large number of holes with large spoil heaps, and the sett generally looks well-used. There will be well-used paths to and from the sett and between sett entrances. Although normally the breeding sett is in continuous use, it is possible to find a main sett that has become disused due to excessive digging or some other reason; it should be recorded as a disused main sett.
Annex Setts: These are often close to the main sett, usually less than 150m away, and are usually connected to the main sett by one or more obvious, well-worn paths. They usually have several holes but may not be in use all the time even if the main sett is very active.
Subsidiary Setts: These often only have a few holes (averaging four), are usually at least 50m from a main sett, and do not have an obvious path connecting with another sett. They are not continuously active.

²⁴ Harris, S.; Cresswell, P. and Jefferies, D. (1989) *Surveying Badgers*. Mammal Society, No. 9, London

²⁵ Wilson, G.; Harris, S. and McLaren, G. (1997) *Changes in the British Badger Population – 1998 to 1997*. People's Trust for Endangered Species, London; and Cresswell, P.; Harris, S. and Jefferies, D. (1990) *The History, Distribution, Status and Habitat Requirements of the Badger in Britain*. Nature Conservancy Council, Peterborough

Sett Descriptions
Outlying Setts: These usually have only one or two holes, often have little spoil outside the hole, have no obvious path connecting with another sett, and are only used sporadically. When not in use by badgers, they are often taken over by foxes or even rabbits. However, they can still be recognised as badger setts by the shape of the tunnel (not the actual entrance hole), which is usually at least 250mm in diameter, and is rounded or a flattened oval shape.

Table EDP A7.2: Categories of Use

Categories of Use
Well used holes: These are clear of any debris or vegetation, are obviously in regular use, and may or may not have been excavated recently.
Partially used holes: These are not in regular use and have debris such as leaves and twigs in the entrance or have moss and/or other plants growing in or around the entrance. Partially used holes could be in regular use after a minimal amount of clearance.
Disused holes: These have not been in use for some time, are partially or completely blocked and could not be used without a considerable amount of clearance. If the hole has been disused for some time, all that may be visible is a depression in the ground where the hole used to be, and the remains of the spoil heap, which may be covered in moss or plants.

Results

- A7.4 Several badger records were received from the desk study, almost all of which were recorded dead on roads.
- A7.5 Some evidence of badger activity (latrines and footprints) was recorded across the Site throughout 2015 and 2017 along hedgerows/field boundaries, particularly associated with the arable land in the east of the Site. Two disused setts were recorded within the Site, within a hedgerow to the south-east of St Frideswide's Farm and within the hedgerow south of the Water Eaton access track as illustrated on **Plan EDP 1**. The sett south-east of St Frideswide's Farm was deemed to be partially active in 2017, but no activity has been recorded since. No activity or signs were found in the 2021 survey.
- A7.6 The presence of two disused setts and evidence of badger activity suggest that the Site forms or previously formed part of the territory of at least one badger clan. Badgers are relatively common and widespread nationally and within Oxfordshire and the presence of a sett on a site of this size is consequently not unexpected. The relatively small population present is therefore considered to be of Site level value.

Annex EDP 8

Brown Hairstreak Butterfly

Methodology

- A8.1 The presence of blackthorn and elm within the on-site hedgerows provides potential for the Site to support a range of notable Lepidoptera namely, brown hairstreak.
- A8.2 To confirm the presence, or likely absence, of brown hairstreak butterflies from the Survey Area an egg search was completed on 11 November 2021. During the survey all blackthorn and elm was searched by hand to identify eggs laid on the branches.
- A8.3 Brown hairstreak butterflies target blackthorn to lay their eggs on, females typically have a preference for laying on the young suckers and new growth on lower branches.
- A8.4 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

- A8.5 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.
- A8.6 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

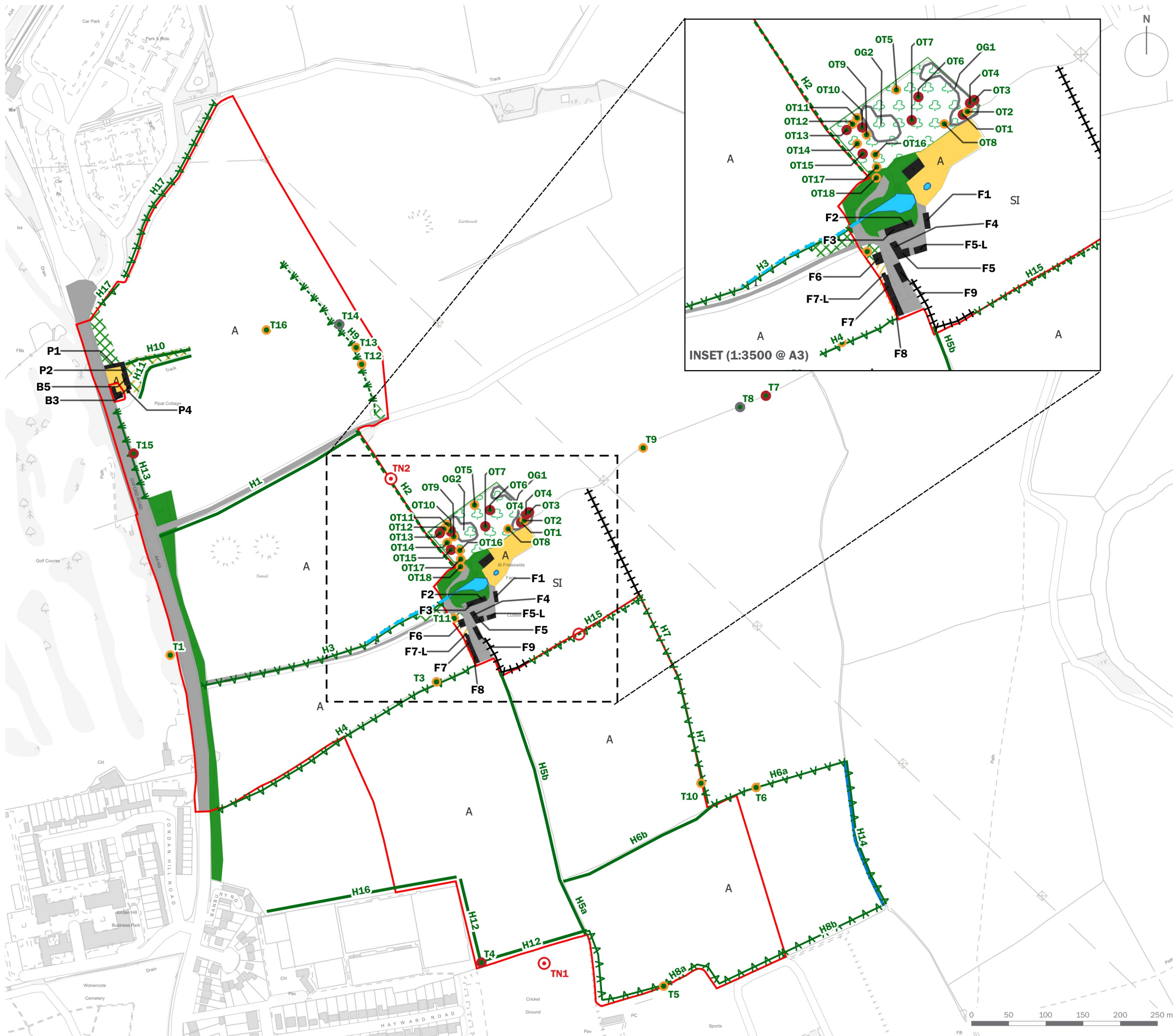
- A8.7 During the survey, a total of twenty-one brown hairstreak butterfly eggs were identified within two of the hedgerows, namely hedgerows H1 and H2 within the Site. The results of the survey are shown on **Plan EDP 24**.
- A8.8 Based on the findings summarised above and owing to the scarcity of the species, it is considered that the population present at the Site is of Local level ecological value.

This page has been left blank intentionally

Plans

Plan EDP 1	Extended Phase 1 Habitat Survey (edp5650_d037d 03 November 2023 GYo/OHo)
Plan EDP 2	Statutory Designated Sites (edp5650_d038a 07 December 2022 GYo/OHo)
Plan EDP 3	Non-statutory Designated Sites (edp5650_d039a 07 December 2022 GYo/OHo)
Plan EDP 4	Transect Routes and Static Detector Locations (edp5650_d040a 07 December 2022 GYo/OHo)
Plan EDP 5	Reptile Refugia Locations (edp5650_d041a 07 December 2022 GYo/OHo)
Plan EDP 6	Pond Locations (edp5650_d043b 03 February 2023 GYo/OHo)
Plan EDP 7	Winter Bird Survey February 2017 (edp5650_d045a 07 December 2022 GYo/OHo)
Plan EDP 8	Winter Bird Survey February 2021 (edp5650_d046a 07 December 2022 GYo/OHo)
Plan EDP 9	Breeding Bird Survey 2017 (edp5650_d047a 07 December 2022 GYo/OHo)
Plan EDP 10	Breeding Bird Survey 2021 (edp5650_d048a 07 December 2022 GYo/OHo)
Plan EDP 11	Breeding Bird Survey 2022 (edp5650_d049a 07 December 2022 GYo/OHo)
Plan EDP 12	Bat Activity Survey April 2017 Dusk (edp5650_d050a 07 December 2022 GY/OHo)
Plan EDP 13	Bat Activity Survey May 2017 Dusk (edp5650_d051a 07 December 2022 GYo/OHo)
Plan EDP 14	Bat Activity Survey June 2017 Dusk (edp5650_d052a 07 December 2022 GYo/OHo)
Plan EDP 15	Bat Activity Survey July 2017 Dusk (edp5650_d053a 07 December 2022 GYo/OHo)

Plan EDP 16	Bat Activity Survey July 2017 Dawn (edp5650_d054a 07 December 2022 GYo/OHo)
Plan EDP 17	Bat Activity Survey August 2017 Dusk (edp5650_d055a 07 December 2022 GYo/OHo)
Plan EDP 18	Bat Activity Survey September 2017 Dusk (edp5650_d056a 07 December 2022 GYo/OHo)
Plan EDP 19	Bat Activity Survey May 2021 Dusk (edp5650_d057a 07 December 2022 GYo/OHo)
Plan EDP 20	Bat Activity Survey July 2021 Dusk (edp5650_d058a 07 December 2022 GYo/OHo)
Plan EDP 21	Bat Activity Survey July 2021 Dawn (edp5650_d059a 07 December 2022 GY/OH)
Plan EDP 22	Bat Activity Survey September 2021 Dusk (edp5650_d060a 07 December 2022 GYo/OHo)
Plan EDP 23	Reptile Survey Results (edp5650_d042a 07 December 2022 GYo/OHo)
Plan EDP 24	Brown Hairstreak Butterfly Survey Results (edp5650_d044a 07 December 2022 GYo/OHo)



- Site Boundary
- Broadleaved Semi-natural Woodland
- Orchard
- Dense Continuous Scrub
- Tall Ruderal
- Scrub and Tall Ruderal
- A** Arable
- A** Amenity Grassland
- I** Improved Grassland
- SI** Poor Semi-improved Grassland
- Standing Water
- Building
- Hardstanding
- Intact Species-rich Hedgerow and Trees
- Intact Species-rich Hedgerow
- Intact Species-poor Hedgerow
- Defunct Species-rich Hedgerow and Trees
- Defunct Species-rich Hedgerow
- Defunct Species-poor Hedgerow
- Running Water
- Dry Ditch
- Fence
- Scattered Trees (Broadleaved)
- ⊙ Target Note
- ⊙ **TN1** Disused Badger Sett
- Group of Trees with Low Bat Roost Potential
- Tree with High Roost Potential
- Tree with Moderate Roost Potential
- Tree with Low Roost Potential
- T1** Tree Number
- OT1** Orchard Tree Number
- OG1** Orchard Group of Trees Number
- B1/P1/F1** Building Number

client
Bellway Homes Limited and Christ Church, Oxford

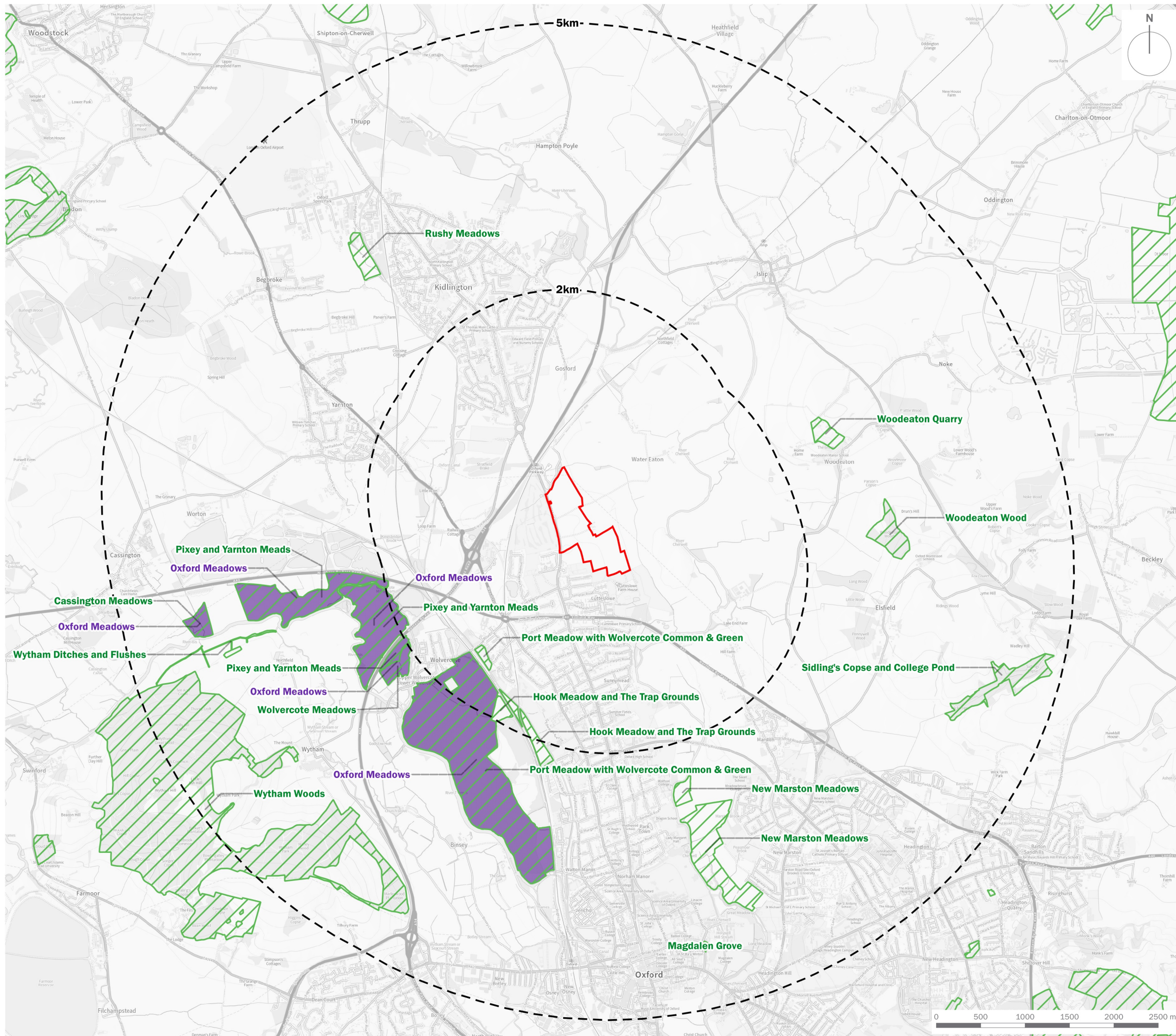
project title
Water Eaton

drawing title
Phase 1 Habitat Plan

date **03 NOVEMBER 2023** drawn by **GYo**
drawing number **edp5650_d037d** checked **OHo**
scale **1:5,000 @ A3** QA **DJo**



Registered office: 01285 740427 - www.edp-uk.co.uk - info@edp-uk.co.uk



- Site Boundary
- Range Rings (at 2km and 5km)
- Special Area of Conservation (SAC)
- Site of Special Scientific Interest (SSI)

client
Bellway Homes Limited and Christ Church, Oxford

project title
Water Eaton

drawing title
Statutory Designated Sites

date	07 DECEMBER 2022	drawn by	Gyo
drawing number	edp5650_d038a	checked	OJo
scale	1:42,000 @ A3	QA	DJo



Registered office: 01285 740427 - www.edp-uk.co.uk - info@edp-uk.co.uk