Land West of Fringford Road, Caversfield

Ecological Appraisal

Prepared by:
The Environmental Dimension Partnership Ltd

On behalf of:
Richborough

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Executive Summary

S1 This Ecological Appraisal has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of Richborough (hereafter referred to as 'the Applicant'). This Appraisal considers the ecological implications of proposed development at land west of Fringford Road, Caversfield.

S2 The Site measures approximately 6.9 hectares (ha) and is located on the western edge of Caversfield, Bicester. It comprises horse-grazed pasture with a mixture of equine and residential buildings towards the centre of the Site. The field parcels are delineated by a network of hedgerows and treelines. The immediate surroundings comprise agricultural pasture to the north and south, and low-density residential dwellings to the east and west of the Site.

S3 The baseline ecological conditions within and around the Site have been established through a desk study data search together with range of field surveys between 2021 and 2023, namely an Extended Phase 1 Habitat survey; hedgerow survey; pilot breeding bird survey; bat roosting and activity surveys; great crested newt survey; and reptile survey.

S4 No part of the Site is covered by any statutory designations and there are also no internationally important designations within 15km of the Site. There are three nationally important designations (Sites of Special Scientific Interest (SSSIs)) within 5km of the Site, although only one of these, namely Ardley Cutting and Quarry SSSI, is designated for its ecological interest. No adverse impacts on the SSSI are anticipated as a result of the proposed development.

S5 Bure Park Local Nature Reserve (LNR) is located approximately 1km downstream of the Site, such that there is a minor risk of adverse hydrological impacts within the LNR from potential changes to the quality or quantity of surface water discharging into the local watercourse from the Site. Such impacts can be readily avoided, however, through surface water management during construction and through the sustainable drainage system (SuDS) which is embedded in the development design.

S6 No part of the Site is covered by any non-statutory designations. There are two Local Wildlife Sites and one Cherwell District Wildlife Site located within 2km of the Site, however none of these are at risk of as a result of the proposed development.

S7 The majority of the Site is made up of semi-improved and poor semi-improved grassland habitats which are of Local-level and less than Local-level importance respectively. Some boundary hedgerows are present which are of Local level importance and are also priority habitats. All other habitats present are of Site-level importance or less.

S8 With respect to protected, priority or other notable species, the Site supports a breeding bird assemblage of Site-level importance only; a single tree of Low suitability for roosting bats; one building found to support a minor bat roost; an assemblage of foraging/commuting bats of Local-level importance; and small populations of common lizard and grass snake. The presence of badger, polecat and hedgehog was not confirmed but their presence on Site in future cannot be ruled out. Great crested newts are

very unlikely to be present, however precautionary measures are proposed in respect of this species during construction.

S9 The development layout retains important habitats as far as possible, including those important in supporting protected and priority species. Some habitat loss is unavoidable to make way for the proposed development, however habitat enhancement and creation is proposed, including a dedicated ecological enhancement zone with no public access on the western edge of the Site, which would mitigate such losses and result in net gains in the Site's biodiversity value. This has been demonstrated using a biodiversity metric, which indicates that the scheme is capable of achieving least 10% net gain in Habitat Units and in Hedgerow Units.

S10 The proposed ecological strategy for the development also includes:

- Measures to protect habitats and avoid harm to species during construction;
- Measures to enhance opportunities for protected and priority species; and
- Measure to maintain and manage features of ecological importance in the long-term.

S11 In light of the above, EDP concludes that the proposed development is capable of compliance with relevant planning policy and legislation and can deliver significant benefits for wildlife and biodiversity.

Section 1
Introduction

1.1 This Ecological Appraisal has been prepared by The Environmental Dimension Partnership Ltd (EDP) on behalf of Richborough (hereafter referred to as 'the Applicant'). This Appraisal considers the ecological implications of proposed development at land west of Fringford Road, Caversfield (hereafter referred to as 'the Site').

1.2 This report has been prepared with reference to the following key guidance:

- Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Preliminary Ecological Appraisal[1];
- CIEEM Guidelines for Ecological Impact Assessment[2];
- British Standard: Biodiversity - Code of Practice for Planning and Development[3]; and
- British Standard: Process for designing and implementing Biodiversity Net Gain[4].

1.3 EDP is an independent environmental planning consultancy with offices in Cirencester, Cardiff and Cheltenham. 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

1.4 The Site is centred approximately at Ordnance Survey Grid Reference (OSGR) SP 58411 25025. The local planning authority (LPA) is Cherwell District Council. The location and extents of the Site are illustrated on **Plan EDP 1** and described in the material supporting the planning application, particularly the Design and Access Statement.

1.5 The Site measures approximately 6.9 hectares (ha) and is located within the outskirts of Caversfield, Bicester. It comprises horse-grazed pasture with a mixture of equine and residential buildings towards the centre of the Site. The field parcels are delineated by a network of hedgerows and treelines. The immediate surroundings comprise agricultural pasture to the north and south, and low-density residential dwellings to the east and west of the Site.

[1] CIEEM (2017). *Guidelines for Preliminary Ecological Appraisal, 2nd edition*. Chartered Institute of Ecology and Environmental Management, Winchester

[2] CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine version 1.2. Chartered Institute of Ecology and Environmental Management, Winchester

[3] BSI (2013) *Biodiversity - Code of Practice for Planning and Development*. BS 42020:2013. British Standards Institute

[4] BSI (2021) *Process for designing and implementing Biodiversity Net Gain. Specification*. BS 8683:2021. British Standards Institute

DEVELOPMENT PROPOSALS

1.6 The proposed development comprises the "*Demolition of existing structures and erection of up to 99 dwellings, access, open space and associated works (outline, all matters reserved save for access*)".

SCOPE OF THE ASSESSMENT

1.7 This Ecological Appraisal describes the current ecological interest within and around the Site, which has been identified through standard desk- and field-based investigations. It then considers the potential ecological impacts and opportunities for ecological enhancement based on the final masterplan (incorporating inherent mitigation) in the context of relevant legislation and planning policy. Finally, this Appraisal identifies the necessary additional measures to avoid, mitigate or provide compensation for potential impacts, and the mechanisms for securing such measures.

1.8 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 on Plans where appropriate);
- **Section 3** summarises the baseline ecological conditions (with further details also provided within Appendices and on Plans where appropriate) and identifies and evaluates any pertinent ecological features/receptors;
- **Section 4** describes how the development design has responded to the ecological constraints and any embedded/inherent mitigation, and then considers the potential impacts of the proposals on pertinent ecological features;
- **Section 5** proposes mitigation and enhancement measures for the current and possible future planning stages, in the context of relevant legislation and planning policy, and mechanisms to secure their delivery; and
- **Section 6** summarises the Mitigation and Enhancement Strategy for the Site and provides the overall conclusions of the Appraisal.

Section 2
Baseline Methodology

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

DESK STUDY

2.2 The desk study is an important element of undertaking an initial ecological appraisal of a site proposed for development, which entails the initial collation and review of contextual information, such as designated sites, together with known records of important habitats or species.

2.3 The desk study involved collating biodiversity information from the following sources:

- Thames Valley Environmental Records Centre (TVERC); and
- Multi-Agency Geographic Information for the Countryside (MAGIC) website[5].

2.4 The desk study was undertaken during August 2023 and involved obtaining the following information:

- International statutory designations (15km radius around the Site);
- National statutory designations and non-statutory local sites (2km radius around the Site);
- Annex II bat species[6] records (6km radius around the Site);
- All other protected, priority and notable species records (2km radius around the Site); and
- All other notable habitat records (500m radius around the Site).

2.5 These search areas are considered sufficient to cover the potential zones of influence[7] of the proposed development in relation to designated sites, habitats and species.

[5] www.magic.gov.uk

[6] Bat species listed in Annex II of the EC Habitats Directive, namely Greater horseshoe, Lesser horseshoe, Barbastelle and Bechstein's bats

[7] Zone of Influence - the areas and resources that may be affected by the proposed development

2.6 The adopted Cherwell Local Plan 2011–2031 and any relevant Supplementary Planning Documents was also reviewed as part of the desk study to understand local priorities with regard to protection of ecological features/biodiversity.

2.7 In addition to the above, previous survey information for the Site, collected by FPCR Consultancy in 2013 year, was reviewed to obtain further contextual information.

EXTENDED PHASE 1 HABITAT SURVEY

2.8 The main habitats within the Site, together with their dominant/characteristic plant species, were identified by undertaking an initial Extended Phase 1 Habitat survey on 20 July 2021. An update Extended Phase 1 Habitat survey was undertaken on 10 July 2023.

2.9 During the survey, habitat type and condition were also recorded to meet the Defra Biodiversity Metric 4.0 data requirements for calculating biodiversity net gain/loss. This was undertaken with reference to the Metric user guide[8] and UK Habitat Classification System[9] which underpins the Metric.

2.10 Full details of the habitat survey methodology are provided within **Appendix EDP 1**.

DETAILED (PHASE 2) SURVEYS

2.11 The scope of Phase 2 Surveys undertaken within the Site was defined following the initial studies described above.

2.12 The surveys 'scoped in' based upon the findings of the Extended Phase 1 Habitat survey are summarised in turn below, with reference to sources of further detailed information where applicable.

Hedgerow Survey

2.13 Owing to the presence of a network of hedgerows within the Site, with variable species-diversity, structure and condition, a detailed survey was undertaken to assess the value and condition of all hedgerows within the Site and to identify whether any of them qualify as 'important', with reference to the Wildlife and Landscape criteria provided in Part II of Schedule 1 of the Hedgerows Regulations 1997. The survey was completed initially undertaken on 20 July 2021. An update hedgerow assessment was undertaken on 10 July 2023.

2.14 Full details of the hedgerow survey methodology, and any limitations encountered, are provided in **Appendix EDP 2**. The location of the hedgerow sections surveyed is shown on **Plan EDP 1**.

[8] Natural England Joint Publication JP039. The Biodiversity Metric 4.0 User Guide. March 2023
[9] UKHAB LTD. (2022) UK Habitat Classification [online]. Available from: http://ukhab.org

Breeding Bird Survey

2.15 The Site supports several habitats which are suitable for nesting birds including hedgerows, treelines and dense scrub. A pilot breeding bird survey was therefore undertaken with reference to standard methodology, entailing a modified Common Bird Census (CBC)[10] 'territory mapping' approach. A single pilot breeding bird survey was undertaken on Site in June 2021, which is at the height of the breeding bird season for lowland Britain.

2.16 The date and timing of the survey visit, and weather conditions encountered, are summarised in **Table EDP 2.1**.

Table EDP 2.1: Breeding Bird Survey Conditions

Date	Start/Finish Time	Precipitation	Cloud Clover (%)	Wind Speed (Beaufort Scale)
21.07.2021	S: 06:30 F: 09:30	Rained prior to survey.	30–60%	0–1

2.17 The survey methodology involved walking around all part of the Site and recording all birds listed within the Birds of Conservation Concern and their activity status, with a particular emphasis placed upon those elements considered to relate to or be indicative of breeding. This ensured that the survey identified all birds using the margins of the Site, as well as those in the interior. Following the competition of the survey, the breeding status of each bird species identified at the Site was determined according to the nature and frequency of the behavioural elements recorded as detailed in **Table EDP 2.2**.

Table EDP 2.2: Summary of Field Evidence used to Determine Bird Breeding Status

Breeding Status	Examples of Behaviour Exhibited
Confirmed	• Distraction display; • Nest building; • Nest with eggs; • Nest with young; • Used nest; • Recently fledged young; and • Adult carrying faecal sac/food.
Probable	• Pair observed in suitable nesting habitat in breeding season; • Permanent territory presumed through registration of territorial behaviour (song, etc.) on at least two different occasions, 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.

[10] Marchant, J. (1983). *Common Bird Census Method*. BTO.

Breeding Status	Examples of Behaviour Exhibited
Possible	• Species observed in breeding season in possible nesting habitat; • Male in song; and • Adult giving alarm call.
Non-breeder	• Feeding birds only; • Birds flying over only; and • Lack of suitable breeding habitat.

2.18 To inform the assessment in this report, the numbers of potential territories identified, the abundance of species at the County and National level, the quality of the habitat present and the geographical range of the birds concerned have been considered, based on national and regional accounts.

2.19 The conservation status of each species of bird was also taken into account and the following lists were considered:

- 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 legal protection accordingly;
- Priority species;
- Birds of Conservation Concern[11] – 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; and
- Local conservation status as listed in the Oxfordshire Bird Report[12].

Limitations

2.20 As with all breeding bird surveys following this technique, the process is open to some subjectivity in interpretation except where active nests are located. Therefore, recorded locations indicate the 'centre' of a territory and not necessarily the breeding location.

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

[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.

[12] Oxfordshire Ornithological Group., (2019)., *Oxfordshire Bird Report 2019*.

Bat Surveys

2.22 During the Extended Phase 1 Habitat survey, one tree and two buildings present within the Site were identified as having potential to support roosting bats. In addition, a number of habitats present within the Site, including horse grazed pasture, semi-improved neutral grassland and hedgerows were identified as being of low suitability to support foraging and commuting bats. The following surveys for bats were therefore undertaken, with reference to best practice guidelines[13]:

Bat Roost Inspection Surveys – Trees

- Preliminary ground level roost assessment of trees for bat roosting suitability, undertaken on 20 July 2021 and updated on 10 July 2023.

Bat Roost Inspection Surveys – Buildings/Built Structures

- Preliminary roost assessment of buildings and built structures to search for evidence of bats and determine the suitability of features to support roosting, undertaken on 20 July 2021 and updated on 10 July 2023; and

- Emergence and/or re-entry surveys of buildings to confirm presence/likely absence of bats within building **B1**, initially undertaken on 20 July and 17 August 2021, and updated on 13 July and 14 August 2023.

Bat Activity Surveys

- Manual transect surveys conducted in June 2021 and updated in June, July and October 2023; and

- Automated detector surveys conducted in June 2021 and updated in June, July, August and September 2023.

2.23 Full details of the bat survey methodologies, and any limitations encountered, are provided in **Appendix EDP 4**.

Great Crested Newt Survey

2.24 An initial assessment of the Site's suitability to support great crested newt (*Triturus cristatus*) was undertaken during the Extended Phase 1 Habitat survey in July 2021 and July 2023 and with reference to desk study records as described above. Two ponds waterbodies were identified within the Site boundaries. In addition, five waterbodies were identified adjacent and within a 500m radius of the Site, of which three are within 250m.

2.25 All waterbodies on Site, and those within 250m of the Site (but not separated from the Site by significant dispersal barriers) to which access was granted, were subject to the following survey types in accordance with relevant best practice guidance:

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

- Habitat Suitability Index (HSI) Assessment[14]; and
- Environmental DNA (eDNA) Sampling[15].

2.26 Waterbodies more than 250m from the Site were not surveyed as the likelihood of great crested newts dispersing over this distance within to the Site is much reduced, and surveys of the nearer waterbodies are sufficient to assess impacts on the local population.

2.27 Full details of the great crested newt survey methodology, and any limitations encountered, are provided in **Appendix EDP 5**.

Reptile Survey

2.28 Areas of tussocky grassland within the field margins, and fields **F3** and **F7** present within the Site provide potentially suitable basking, foraging, dispersal and hibernation habitats for common and widespread reptile species. A detailed refugia-based reptile survey was therefore undertaken to confirm the presence and distribution, or likely absence, of reptiles within the Site with reference to best practice guidelines[16].

2.29 A total of 45 artificial refugia were initially deployed in all suitable habitats across the Site on in July 2021 and four checks were undertaken between August and September 2021 (prior to the survey being put on hold). A full update survey was undertaken throughout 2023. A total of 49 artificial refugia were re-deployed in all suitable habitats across the Site on 20 June 2023. Areas of exceptionally low or negligible suitability for reptiles (for example hardstanding and horse grazed pasture) were excluded from the survey. This equates to seven refugia per hectare in accordance with best practice guidelines for 'general survey purposes'. Survey visits were undertaken on seven subsequent occasions in suitable weather conditions and involved two techniques:

- Visual encounter surveys – entailing a walked transect across the Site to undertake a visual search for basking animals in suitable habitat or evidence of animals (e.g. sloughed skin); and
- Checking of the artificial refugia for sheltering or basking animals to establish the presence/likely absence of reptiles.

2.30 This ensured that all areas were represented in the survey, and that the survey was not biased towards those reptiles more likely to use refugia, such as slow worm (*Anguis fragilis*).

2.31 During each survey visit, the following information was recorded: species, number of animals observed, and sex where possible, location (refugia or visual encounter), date, start and finish times, and weather. A summary of the 2023 survey dates, times and weather conditions are presented in **Table EDP 2.3**.

[14] 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

[15] As approved by Natural England. http://www.freshwaterhabitats.org.uk/wordpress/wp-content/uploads/2013/09/eDNA- water-sample-methods-FHT.pdf

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

Table EDP 2.3: Reptile Survey Visits 2023

Survey Visit	Date	Start Time	End Time	Wind Speed (Beaufort Scale)		Temperature (^{0}C)		Cloud Cover (%)	
				Min	Max	Min	Max	Min	Max
1	10.07.23	07:45	08:30	1	1	12	14	30	80
2	25.07.23	09:30	10:44	1	3	16	17	50	60
3	16.08.23	09:15	10:00	1	1	17	18	10	30
4	23.08.23	09:00	09:45	1	1	16	18	10	30
5	07.08.23	08:10	08:10	0	1	17	18	20	50
6	22.09.23	11:00	12:00	2	3	14	14	60	70
7	26.09.23	11:00	15:00	0	1	14	16	10	95

2.32 Where reptiles were recorded, peak survey counts were then used to estimate approximate population size class for each species. Estimates of population size class followed the approach given in the best practice guidelines referred to above and are summarised with respect to widespread reptiles in **Table EDP 2.4**.

Table EDP 2.4: Reptile Population Size Class Estimates

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

Limitations

2.33 Checks 1 to 5 were undertaken during June to August, which can be sub-optimal for refugia-based surveys owing to high air temperatures. However, as shown in **Table EDP 2.4**, all surveys were undertaken within optimal weather conditions and therefore, this is not considered to be a significant limitation to the survey effort.

2.34 Furthermore, owing to the inconspicuous nature and inherent low detectability of reptiles, the peak counts recorded will only reflect a small proportion of the total population present. In addition, the survey design does not allow for a truly accurate estimate of population size class due to the low number of survey visits completed (population size class estimates typically require at least 20 survey visits), and as such, population sizes should only be treated as indicative.

ECOLOGICAL SURVEYS SCOPED OUT

2.35 **Table EDP 2.5** summarises other survey types which, whilst occasionally required to inform a planning submission for development sites, are not deemed to be necessary/appropriate in this case.

Table EDP 2.5: Ecology Surveys Scoped Out

Survey Type	Reasons for Scoping Out
Over-wintering Bird Survey	Habitats present within the Site are likely to support only an assemblage typical of the locality and in line with local records, so no targeted surveys are considered necessary.
Dormouse (*Muscardinus avellanarius*) Survey	No records of dormice were returned from within 2km of the Site. Optimal woodland habitats are present within the wider landscape, but these are poorly connected to the Site. It is anticipated that suitable on Site habitats will be largely retained and enhanced within the scheme, which minimises the potential for impacts.
Otter (*Lutra lutra*) and Water Vole (*Arvicola amphibius*) Survey	There are no wet ditches within the Site and the waterbodies present within the Site are of limited value for these species given their isolation from other suitable waterbodies/watercourses in the local surroundings and the lack of suitable foraging opportunities.
Invertebrate Survey	The vast majority of the Site comprises of habitats of low quality, maturity and distinctiveness with limited floristic diversity. There are no notable records or nearby sites designated for invertebrates within the Site's potential zone of influence. Any habitats that are of higher quality for invertebrates will be primarily retained through design.

Section 3
Baseline Results

3.1 This section of the Ecological Appraisal summarises the baseline ecological conditions determined through the course of desk-based 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, where appropriate, provided within Appendices and on Plans to the rear of this report.

3.2 Where a particular ecological feature/receptor has been confirmed to be present, or presence is inferred based on habitat suitability, its ecological importance is assessed. The level of ecological importance assigned to each ecological feature is based upon established geographical value systems and the uses the following scale: International and European (highest) > National > Regional > County > District > Local > Negligible (lowest).

DESIGNATED SITES

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

Statutory Designations

3.4 Statutory designations represent the most significant ecological receptors. Internationally important statutory designations include Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar Sites (including potential SPAs, possible SACs and proposed Ramsar Sites). These designations are protected under the Conservation of Habitats and Species Regulations 2017 (as amended) (the Habitats Regulations). These designations are referred to as 'habitats sites' in the National Planning Policy Framework (NPPF, December 2023) and development which would adversely affect a habitats site (alone or in combination) cannot benefit from the NPPF presumption in favour of sustainable development.

3.5 Nationally important statutory designations include SSSI and National Nature Reserves (NNR). NNRs are also SSSIs, both of which are protected under the Wildlife and Countryside Act 1981 (as amended). The NPPF states that development which would adversely affect as SSSI should not normally be permitted.

3.6 Local level statutory designations include Local Nature Reserves (LNR) and are generally considered to be of importance at the County level or lower. LNRs are designated under the National Parks and Access to the Countryside Act 1949, however, protection of LNRs is given via local planning policies and/or by-laws.

3.7 Statutory designations are also recognised as key natural assets within the adopted Cherwell Local Plan 2011 – 2031.

3.8 No part of the Site is covered by any statutory designations and there are also no internationally important designations within 15km of the Site. There are three nationally important designations (SSSIs) within 5km of the Site, however, two of these are designated for their geological rather than ecological interest only and are therefore not considered further here. In addition to the above there is one county important designation (LNR) within 2km of the Site. These sites are summarised in **Table EDP 3.1** and illustrated on **Plan EDP 2**.

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

Designation	Approx. Distance from the Site	Interest Feature(s)
Nationally Important Statutory Designated Sites (within 5km of the Site)		
Ardley Cutting and Quarry SSSI	1.2km west of the Site	This site lies in the eastern part of the Oxfordshire Cotswolds along a section of the London to Birmingham railway line. It is of geological interest for its exposures of Jurassic rocks and has biological interest associated with limestone grassland, scrub, ancient woodland and wetland habitats. The soils are mostly shallow loams of the Aberford Series, interrupted in places by bands of ill-draining clays and outcrops of Northants sands giving rise to changes in the flora.
Statutory Designated Sites of County Importance (within 2km of the Site)		
Bure Park LNR	1km south-west of the Site	Habitats at Bure Park nature reserve include grass meadow, young broad-leaved woodland, hedges and scrub. A small river (the Bure) runs through the site, feeding a small pond which is home to great crested newts. A balancing pond at one end of the Reserve is fed by run-off from the area.

Non-statutory Designations

3.9 Non-statutory designations are also commonly referred to in planning policies as 'local sites', although such designations are typically considered to be of importance at a County level. In Oxfordshire, such designations are termed Local Wildlife Sites (LWS). Additional designations within the District include proposed LWSs and Cherwell District Wildlife Sites (CDWS). These are sites of local importance in the Cherwell District with their own selection criteria with lower threshold and requirements than those for LWSs. These sites do not meet the criteria for LWS designation but may be included within Local Plans.

3.10 In addition, there are other non-statutory designations which may be pertinent in the locality. Within Oxfordshire, Conservation Target Areas (CTA) have also been established by Wild Oxfordshire who have identified the most important areas for wildlife conservation in

Oxfordshire where conservation action will have the greatest benefit due to supporting Priority habitats and Species[17].

3.11 No part of the Site is covered by any non-statutory designations. There are two LWSs and one CDWS located within 2km of the Site, as summarised in **Table EDP 3.2** and illustrated on **Plan EDP 3**. The Tusmore and Shelswell Parks CTA also lies within 2km of the Site.

Table EDP 3.2: Non-Statutory Designations Within 2km of the Site

Designation	Approx. distance from Site	Interest Feature(s)
Bicester Airfield LWS	0.7km south-east of the Site	This site is an airfield and surrounding areas of grassland and scrub. It includes areas of species-rich grassland and rough grassland around the periphery of the short-mown grassland used as runways. There are also several old track ways that are breaking up and have an interesting range of plants.
Skimmingdish Lane Balancing Pond CDWS	0.8km south-east of the Site	This section of Skimmingdish Lane Balancing Pond includes areas of species-rich grassland and scrub.
Tusmore and Shelswell Parks Conservation Target Area	1.8km north-west of the Site	The site encompasses the parks and woodlands at Tusmore and Shelswell Parks in addition to a number of ancient woodlands near Stoke Lyne. Oxfordshire biodiversity action plan targets associated with this CTA include the management, restoration and creation of lowland mixed deciduous woodland and parking (including veteran trees).

[17] Wild Oxfordshire., (2017)., The State of Nature in Oxfordshire 2017 – Full Report. Wild Oxfordshire, The Manor House, Little Wittenham, Abingdon, Oxfordshire OX14 4RA.

Designation	Approx. distance from Site	Interest Feature(s)
Twelve Acre Copse LWS	1.9km north-west of the Site	This small woodland lies on level alkaline to neutral soils, set among arable fields. The canopy is dominated by ash (*Fraxinus excelsior*) with some sycamore (*Acer pseudoplatanus*), wild cherry (*Prunus avium*) and areas of grey poplar (*Populus* × *canescens*). Formerly there was probably elm (*Ulmus spp.*), as there are many suckers. The understorey consists mostly of ash and hazel (*Corylus avellana*), with other species including hawthorn (*Crataegus mongyna*), spindle (*Euonymus europaeus*) and elder (*Sambucus nigra*). The ground flora is bluebell (*Hyacinthoides non-scripta*), dog's mercury (*Mercurialis perennis*) and lesser celandine (*Ficaria verna*). It is included on the Natural England's ancient woodland inventory and has species typical of long-established woodland such as wood anemone (*Anemonoides nemorosa*), pignut (Conopodium *majus*) and goldilocks buttercup (*Ranunculus auricomus*).

HABITATS

3.12 There are several mechanisms by which habitats that lie outside of statutory and non-statutory designations are protected, or by which their importance is recognised at a national level. This includes the following:

- 'Important' hedgerows are protected from removal (out with the planning process) by the Hedgerows Regulations 1997;
- Certain habitats are listed as Priority habitats, the conservation of which public authorities in England must have due regard to as part of policy or decision making under Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006;
- Part 6 of the Environment Act 2021 introduces a mandatory minimum 10% biodiversity net gain requirement for all new developments that are subject to the Town and Country Planning Act 1990. Further secondary legislation (expected in November 2023) is required before this comes into force, however;
- Paragraph 186 of the NPPF includes a presumption against development which results in significant harm to biodiversity (including habitats), or results in the loss of

irreplaceable habitat[18]. This paragraph also encourages development to secure measurable net gains for biodiversity; and

- The importance of protecting habitats, and networks of habitats, is reflected in the Cherwell Local Plan, specifically Policy ESD 10.

3.13 The distribution of different habitat types within the Site is illustrated on **Plan EDP 1**. The habitats are further described in **Appendix EDP 1** alongside illustrative photographs and species lists.

3.14 A summary and qualitative assessment of the existing habitats, using both Joint Nature Conservation Committee (JNCC) Phase 1 and Defra Biodiversity Metric 4.0 terminology, is provided in **Table EDP 3.3**.

3.15 **Plan EDP 1** also shows the field numbers and hedgerow reference numbers referred to below.

3.16 With regard to off-site priority and/or irreplaceable habitats, Twelve Acre Copse LWS noted above is one of several parcels of ancient woodland (most of which is ancient semi-natural woodland (ASNW)) situated to the north-west of the Site.

[18] Irreplaceable habitats are technically very difficult (or take a very significant time) to restore, recreate or replace once destroyed. They include ancient woodland, ancient and veteran trees, blanket bog, limestone pavement, sand dunes, salt marsh and lowland fen.

Table EDP 3.3: Summary of Existing Habitats Within the Site

JNCC Phase 1	DEFRA Metric 4.0			Area/ Length	Distribution	Intrinsic Ecological Importance*
Habitat Type	**Habitat Type**	**Distinctiveness**	**Condition**			
Area Habitats (Hectares (ha))						
Bare-ground	Artificial unvegetated; unsealed surface	V. Low	N/A - Other	0.0068	Small areas across the site	Negligible
Buildings/hard-standing	Developed land; sealed surface	V. low	N/A	0.633	Numerous buildings and structures present towards the centre of the Site.	Negligible
Bramble Scrub	Bramble Scrub	Medium	Condition Assessment – N/A	0.0575	Scattered areas of bramble are present within the field margins.	Site
Mixed Scrub	Mixed Scrub	Medium	Moderate	0.073	Scattered areas of hawthorn, blackthorn and elder present within the field margins.	Site
Poor semi-improved grassland	Modified Grassland	Low	Poor	2.368	Fields **F1**, **F4**, **F6** and **F8**	Less than Local
Poor semi-improved grassland	Modified Grassland	Low	Good	0.365	Fields **F2** and **F5**	Less than Local
Semi-improved neutral grassland	Other neutral grassland	Medium	Moderate	3.2516	Field **F3** and **F7**	Local
Tall ruderal	Ruderal/Ephemeral	Low	Moderate	0.0358	Small pockets of tall ruderals are present across the Site	Site
Ponds	Ponds (Non-Priority Habitat)	Medium	Moderate	0.0146	Ponds 1 and 2	Less than Local
Vegetated Garden	Vegetated Garden	Low	Condition Assessment N/A	0.1723	Small areas adjacent to building **B1** and **B2**.	Site

JNCC Phase 1	DEFRA Metric 4.0			Area/ Length	Distribution	Intrinsic Ecological Importance*
Habitat Type	**Habitat Type**	**Distinctiveness**	**Condition**			
Linear Habitats (Kilometres (Km))						
Intact species-poor hedgerow	Native hedgerow	Low	Good	0.083	Hedgerow **H2**	Local (Priority Habitat)
Intact species-poor hedgerow with trees	Native hedgerow with trees	Medium	Good	0.3	Hedgerows **H1** and **H2**	Local (Priority Habitat)

*Importance irrespective of any protected, priority or other notable species which may be present

3.17 As noted within **Table EDP 3.3**, the majority of the Site is made up of habitats which are of less than Local, or negligible, intrinsic importance. However, the hedgerows are considered judged to be of Local level importance and are Priority habitats. Furthermore, a number of the habitats, including those which are of limited intrinsic importance, also require consideration in relation to their importance in maintaining populations of protected, priority or other notable species. This is discussed further below.

PROTECTED, PRIORITY OR OTHER NOTABLE SPECIES

3.18 Certain species receive legal protection in the UK and are commonly known as 'protected species'. In reality, the level of protection for different species varies considerably, from protection solely against 'killing and injury' to full protection of the species and their places of refuge. Where pertinent, details of legal protection afforded to species/species-groups are provided below.

3.19 In addition to protected species there are other species/species-groups that do not receive legal protection, but which are notable owing to their conservation status. This includes priority species, the conservation of which public authorities in England must have due regard to under the NERC Act (2006). The NPPF recognises species as an important component of biodiversity, as does the Cherwell Local Plan, specifically Policy ESD 10.

3.20 The likelihood of presence, or confirmed presence, of protected, priority or other notable[19] 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 the appendices and plans where referenced.

Breeding Birds

3.21 All wild birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 (as amended) (WCA). This makes it an offence to:

- Intentionally kill, injure or take any wild bird;
- Take, damage or destroy the nest of any wild bird while it is in use or being built;
- Take, damage or destroy the egg of any wild bird; or
- To have in one's possession or control any wild bird (dead or alive) or egg, or any part of a wild bird or egg.

3.22 In addition, further protection is afforded to those wild bird species listed on Schedule 1 of the WCA, prohibiting any intentional or reckless disturbance to these species while it is nest building, or at a nest containing eggs or young, or to recklessly disturb the dependent young of such a bird. A number of species are also included as priority species.

3.23 A large number of records of bird species were retrieved during the desk study, including 9 records of WCA Schedule 1 species, 15 records of priority species, and a further 37 records

[19] Notable species are those which are not legally protected but are formally identified as being of conservation concern

of species included on the latest Red and Amber lists of Birds of Conservation Concern[20]. The vast majority of records received relate to species that would not normally breed in habitats found within the Site. Records of the species with possible suitable breeding habitats on Site include bullfinch (*Pyrrhula pyrrhula*), dunnock (*Prunella modularis*), greenfinch (*Chloris chloris*), house sparrow (*Passer domesticus*), linnet (*Linaria cannabina*), song thrush (*Turdus philomelos*), wood pigeon (*Columba palumbus*), wren (*Troglodytes troglodytes*) and yellowhammer (*Emberiza citrinella*).

3.24 The pilot breeding bird survey identified total of 19 bird species within the Site, the majority of which are common farmland and urban bird species (see **Plan EDP 4**). These species were primarily recorded in association with the boundary hedgerows, scattered mixed trees and scrub. This is included probable breeding dunnock, song thrush and wren. Furthermore, skylark (*Alaudo arvensis*) were recorded flying over the Site into an adjacent off-site field to the south-west. Due to the nature of the Site, which is likely subject to high levels of disturbance by horses, and nature of the activity observed, it is unlikely that skylark use the Site for breeding. The assemblage of breeding birds recorded using the Site is judged to be of up to Site-level importance.

Bats

3.25 All species of British bat are listed as European Protected Species (EPS) on Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended) (referred to as the 'Habitats Regulations'). This affords strict protection to bats and their roosts, and makes it an offence to:

- Deliberately capture, injure or kill a wild animal of an EPS;
- Deliberately disturb wild animals of an EPS wherever they are occurring, in particular, any disturbance which is likely to impair their ability to survive, to breed or reproduce, to significantly affect the local distribution or abundance of the species to which they belong, or in the case of hibernating or migratory species, to hibernate or migrate; or
- Damage or destroy a breeding site or resting place of a wild animal of an EPS.

3.26 Additional protection for bats is also afforded under the WCA, making it an offence to intentionally or recklessly disturb bats whilst they are occupying a structure or place which is used for shelter or protection, or to obstruct access to this structure or place. In addition, soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat (*Plecotus auritus*), greater horseshoe bat (*Rhinolophus ferrumequinum*), barbastelle bat (*Barbastella barbastellus*), Bechstein's bat (*Myotis bechsteinii*), noctule (*Nyctalus noctula*), and lesser horseshoe bat (*Rhinolophus hipposideros*) are also listed as priority species.

[20] 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.

3.27 The desk study returned 360 records for bats within the 6km search radius around the Site. These records relate to at least 8 different species, with the closest record of confirmed bat roosting being for brown long-eared species located approximately 3km from the Site.

3.28 Of the total number of recordings, 4 records of Annex II species were returned within 6km of the Site, all relating to barbastelle. No records of Annex II species roosts were recorded.

3.29 One nearby record relating to European Protected Species Mitigation Licences (EPSML) issued for bats were returned from the data search on MAGIC. This was for the destruction of a breeding site and resting place for common pipistrelle (*Pipistrellus pipistrellus*), brown long-eared bat and barbastelle bat c. 1.6km north-west of the Site.

Bat Roosting

Trees

3.30 With respect to trees, a single tree was identified as supporting features of Low suitability for roosting bats. Full details are provided within **Appendix EDP 3** with the tree location labelled as Target Note (TN) **TN1** on **Plan EDP 1**.

Buildings/Built Structures

3.31 With respect to buildings, a total of two buildings were identified with suitable features for bat roosting in 2021, with one building supporting a confirmed bat roost and one having Low suitability for roosting bats. Building **B1** was confirmed as a bat roost based on the presence of droppings within the roof void.

3.32 During the update assessment in 2023, it was noted that external lighting has since been installed on **B1** and **B2**, which has resulted in significant light spill on features suitable for roosting bats. This has reduced their suitability from 'confirmed roost' to 'moderate' suitability for **B1** and 'low' to 'negligible' suitability. Full details are provided within **Appendix EDP 3** with building locations shown on **Plan EDP 5.**

Dusk Emergence Surveys

3.33 Update emergence surveys have been undertaken for building **B1** between July and August 2023. Similar to 2021, relatively low levels of foraging and commuting activity were recorded during the emergence surveys. Activity was typically dominated by common pipistrelle bats with low levels of activity by soprano pipistrelle bats.

3.34 A summer day roost for a single common pipistrelle bat was identified within building **B1** during the dusk emergence surveys in July and August 2021, whilst no evidence of roosting bats was identified within building **B2**. During the update surveys, no evidence of roosting common pipistrelle bats was identified within **B1**, as such, it is not considered likely that this roost is currently active, however, their absence cannot be ruled out with certainty given the characteristic irregularity of usage by common pipistrelle day roosts. As such, for the purpose of this assessment the common pipistrelle roost is still deemed to be present within **B1**.

3.35 Common pipistrelle is a common and widespread species, and the roost identified is not considered to be of high conservation significance due to the low number of bats recorded. The roosting bat assemblage present is therefore considered to be of Site importance.

Bat Foraging/Commuting Activity

3.36 Overall, the habitats present within the Site were assessed as being of Low suitability for foraging and commuting bats.

3.37 Automated detector locations (and the transect route used) are shown on **Plan EDP 6**. The findings of the manual transect and automated detector surveys are provided in detail within **Appendix EDP 3** and the approximate distribution and diversity of bat species recorded during the transect surveys are illustrated on **Plans EDP 7**–**9**.

3.38 In summary, levels of bat activity recorded during the manual transects were generally low with a total of four species recorded throughout the survey period and comprised primarily of common and soprano pipistrelle bats with occasional activity by noctule and serotine (*Eptesicus serotinus*). The majority of activity observed comprised of individual bats rather than high numbers of bats at any one time and no significant commuting routes have been noted.

3.39 A total of eight bat species/species groups (*Myotid* and long-eared bat species were not identified to species level), were confirmed to be present foraging and/or commuting within the Site during the transect and/or automated detector surveys. The vast majority of passes were from common pipistrelle bats. In relative, calls by soprano pipistrelle, *Myotid* bats, noctule and serotine bats formed a smaller portion of the calls. The remaining bat species: Nathusius' pipistrelle (*Pipistrellus nathusii*), brown long-eared bat and barbastelle made up a very small minority of the overall total.

3.40 Levels of bat activity recorded during the automated detector surveys were also generally low, with levels of activity gradually increasing during the July and September surveys. Marginally higher levels of activity were also recorded at Location 1, adjacent to hedgerow **H3**, relative to Location 2, adjacent to hedgerow **H2**.

3.41 Taking into account the diversity of bat species utilising the Site and the extent of their roosting, foraging and commuting activity, the overall bat species assemblage using the Site is considered to be of Local importance.

Badger

3.42 Badgers and their setts are protected under the Protection of Badgers Act 1992, which makes it an offence (*inter-alia*) to:

- Wilfully kill, injure, take, or cruelly ill-treat a badger; and
- Damage or interfere with a sett, by doing one of the following things:
    - Damage a badger sett or any part of it;
    - Destroy a badger sett;

- Obstruct access to, or any entrance of, a badger sett;
- Cause a dog to enter a badger sett; or
- Disturb a badger when it is occupying a sett.

3.43 The 1992 Act defines a badger sett as "*any structure or place which displays signs indicating current use by a badger*".

3.44 The protection afforded to badgers is primarily due to animal welfare issues and history of persecution rather than concerns over their unfavourable nature conservation status.

[redacted]

Other Mammal Species

3.46 Records of the following Priority mammal species were returned within 2km of the Site:

- Polecat (*Mustela putorius*) – one recorded 1.65km north-west of the Site from 2015;
- European hedgehog (*Erinaceus europaeus*)[21] – 94 records within 2km of the Site, the closest of which is located c.370m north-east of the Site from 2015.

3.47 The Site encompasses a range of suitable foraging and breeding habitats for European hedgehog and there is a reasonable probability that this species is present on Site. The population of European hedgehog potentially occurring on the Site is only considered to be of Site-level importance.

Great Crested Newt

3.48 Great crested newt is an EPS receiving strict protection under the Habitats Regulations as summarised above in respect of bats. Additional protection is also afforded to this species under the WCA as summarised above in respect of bats. This species is also listed as a priority species.

3.49 Two records of great crested newt were returned within 2km of the Site, the nearest record being circa 1.3km south-west from the Site. Furthermore, it is known that FPCR undertook population assessments in 2013 for off-Site pond **P7** c. 250m north-west of the Site, which supported a confirmed population of great crested newts. No nearby records relating to EPSMLs issued for great crested newt were returned from the data search on MAGIC.

[21] Hedgehogs are also protected from capture or killing by specific methods under Schedule 6 of the WCA

3.50 The full results of EDP's great crested newt surveys are detailed in **Appendix EDP 4** and summarised in **Table EDP 3.4**. The locations of the surveyed waterbodies are illustrated on **Plan EDP 10**.

Table EDP 3.4: Great crested newt Survey Results from 2021 and 2023

Waterbody Ref. No.	Distance to the Site	HSI Result 2023	eDNA Result 2021
Pond **P1**	On Site	Poor (0.49)	Too dry to survey
Pond **P2**	On Site	Poor (0.45)	Negative

3.51 Due to the limited suitability of on Site waterbodies, which have consistently been of 'poor' suitability for great crested newts, an update eDNA survey was not undertaken for ponds **P1** and **P2**. Furthermore, due to the separation of the Site and on Site waterbodies from the closest suitable waterbody (**P7**) is over 250m from the Site and is surrounded by woodland which provides optimal terrestrial habitat for great crested newts. Therefore, it is considered highly unlikely that newts would regularly disperse from **P7** into Site, which primarily supports habitats sub-optimal for newts in their terrestrial and aquatic phase.

3.52 Based on the above, great crested newts are considered to be absent from the Site, but sensitive measures required in relation to reptiles (discussed later in this report) would ensure that, in the unlikely event that individuals of this species do occasionally occur in the Site, these would be detected and harm during construction would be avoided.

Other Amphibian Species

3.53 Other legally protected amphibians are rare and have a very restricted distribution[22], however common toad (*Bufo bufo*) is a widespread species which is listed as a priority species. Three records for common toad and two records for smooth newt (*Lissotriton vulgare*) are present within 2km of the Site. The occasional presence of common amphibians within the Site cannot be ruled out entirely, but significant populations are very unlikely to be present.

Reptiles

3.54 All species of common reptile, namely common lizard (*Zootoca vivipara*), slow worm, grass snake (*Natrix helvetica*) and adder (*Vipera berus*), receive at least limited protection from harm under the WCA, making it an offence to cause intentional killing and injuring of these species. In addition, these species are also listed as priority species.

3.55 Ten reptile records were returned within 2km of the Site, relating to grass snake and common lizard, however, none are located on habitats directly or indirectly connected to the Site.

[22] Natterjack toad (*Epidalea calamita*) and Northern pool frog (*Pelophylax lessonae*) are EPS, protected under WCA and priority species

3.56 A detailed reptile survey was previously undertaken on Site between August and September 2021, during which a peak count of two grass snake and one common lizard was recorded on Site.

3.57 The update reptile survey in 2023 recorded a peak adult count of two common lizard and two grass snake. These were primarily located along the north-western and south-western boundaries within the field margins and boundary scrub of fields **F1** and **F3**. Furthermore, a single juvenile grass snake was identified along the eastern boundary of field **F6**. The survey findings are summarised in **Table EDP 3.5** and illustrated on **Plan EDP 11**.

Table EDP 3.5: Reptile Survey Results 2023

Survey Date	Common Lizard		Grass Snake	
	Adult	Juvenile	Adult	Juvenile
10.07.23	0	0	2	0
25.07.23	0	0	2	7
16.08.23	0	0	0	2
23.08.23	0	0	0	5
07.08.23	0	0	0	2
22.09.23	0	0	1	4
26.09.23	2	0	1	6
Peak Adult Count	**Count: 2**		**Count: 2**	
Population Size Class	**Small**		**Small**	

3.58 Given their limited density within the Site and relative widespread distribution across the County, the small populations of common lizard and grass snake within the Site are judged to be of Site importance.

Rare/Scarce Plant Species

3.59 48 records of rare/scarce plants were returned within 2km of the Site. Of these species, the Site supports grassland habitats which could be potentially suitable for common eyebright (*Euphrasia nemorosa*), field scabious (*Knautia arvensis*), hoary plantain (*Plantago media*), narrow-leaved bird's-foot-trefoil (*Lotus tenuis*) and quaking grass (*Briza media*). During the initial and update walkover survey, none of these species were recorded have been identified within the Site, and due frequent horse-grazing, it is considered highly unlikely that suitable conditions would be created for these species within the Site.

SUMMARY OF KEY SURVEY FINDINGS

3.60 The key ecological features/receptors pertinent to the development proposals, based on the survey findings described above, are set out in **Table EDP 3.6**.

Table EDP 3.6: Summary of Ecological Features

Feature	Key Attributes	Ecological Importance
Statutory Designated Sites		
Bure Park LNR	1km south-west of the Site – designated for its grassland meadow, woodland and stream.	County
Ardley Cutting and Quarry SSSI	1.2km west of the Site – designated for its geological importance and limestone grassland.	National
Non-statutory Designated Sites		
Bicester Airfield LWS	0.7km south-east of the Site – designated for its species-rich and rough grassland.	Local
Skimmingdish Lane Balancing Pond CDWS	0.8km south-east of the Site – designated for its species-rich grassland and scrub.	Local
Tusmore and Shelswell Parks CTA	1.8km north-west of the Site – designated to encourage ecological enhancement focussing on parkland and woodland.	Local
Twelve Acre Copse LWS	1.9km north-west of the Site – designated for its woodland.	Local
Habitats		
Hedgerow	Hedgerows **H1** to **H3** qualify as Priority habitats.	Local
Ponds (non-Priority Habitat)	Ponds **P1** and **P2** do not meet the criteria for a Priority Habitat pond but remain of local importance.	Local
Species		
Breeding Birds	Breeding birds recorded within the Site include common farmland and urban bird species.	Local
Bats	A moderate diversity of bat species recorded foraging and commuting within the Site, including barbastelle.	Local
Reptiles	Low numbers of common reptiles are present within the field margins on Site.	Site

Section 4
Impact Assessment

4.1 This section of the Ecological Appraisal first considers any avoidance/mitigation which is embedded within development design. It then considers the likely impacts of the development proposals on the pertinent ecological features identified in **Section 3** in the absence of additional mitigation.

EMBEDDED MITIGATION

4.2 EDP has provided input throughout the iterative design process so the development layout, although illustrative, reflects some important measures to avoid, mitigate or compensate for ecological impacts as well as other measures designed to provide long-term ecological enhancements. This embedded mitigation comprises the following:

- Retention/buffering of valuable habitats (including habitats known to support protected/notable species), including the vast majority of the existing boundary hedgerows and a significant proportion of the semi-improved grassland;
- Inclusion of natural/informal greenspace within the development where the creation or enhancement of ecologically valuable/biodiverse habitat is proposed, including a dedicated ecological enhancement zone to be fenced off with no public access on the western edge of the Site and other areas of publicly accessible natural open space designed for biodiversity;
- Inclusion of a SuDS to maintain run-off rates and to maintain or improve the quality of surface water discharging into nearby watercourses.

IMPACTS ON DESIGNATED SITES

Statutory Designations

4.3 As described in **Section 3**, there are two statutory designations within the potential zone of influence of the Site. The potential impacts on these designations, in the absence of additional mitigation, are discussed below.

Ardley Cutting and Quarry SSSI

4.4 Owing to the physical separation of Ardley Cutting and Quarry SSSI from the Site, no direct adverse impacts are anticipated as a result of the proposed development. Furthermore, there are no impact pathways for potential indirect impacts, in particular the SSSI is not accessible to the public for recreational use and there are no hydrological connections. Thus, no adverse impacts on the SSSI are anticipated as a result of the proposed development.

Bure Park LNR

4.5 Owing to the physical separation of Bure Park LNR from the Site, no direct adverse impacts are anticipated as a result of the proposed development. In terms of indirect impacts, the risk of adverse impacts from increased recreational pressure is judged to be minimal owing to the position of the LNR within the urban zone of west Bicester and likely high levels of existing recreational use, together with the minimal additional recreational use that the proposed development would potentially generate.

4.6 The watercourse to the west of the Site connects downstream to the LNR, albeit over a distance of approximately 1km. There is therefore a minor risk of adverse hydrological impacts within the LNR from potential changes to the quality or quantity of surface water discharging into the local watercourse from the Site during construction or post-development. Post-development impacts can be ruled out based upon the provision of SuDS which is embedded in the development design.

Non-statutory Designations

4.7 As described in **Section 3**, there are four non-statutory designations within the potential zone of influence of the Site.

4.8 No adverse impacts upon Bicester Airfield LWS, Skimmingdish Lane Balancing Pond CDWS, or Tusmore and Shelswell Parks CTA owing to their physical separation from the Site and absence of any pathways for indirect effects.

4.9 Twelve Acre Copse LWS is not at risk of any direct impacts, due to its separation distance, nor any indirect recreational impacts, as it is not accessible to the public. Potential air quality impacts, from increased traffic along the B1400 which runs beside the LWS, have been ruled out in discussion with the appointed air quality consultants for the planning application. This is on the basis that it is predicted that the development traffic along the B4100 will be 64 AADT which falls well below the standard threshold (1,000 AADT) which would trigger a more detailed air quality assessment.

IMPACTS ON HABITATS

4.10 As described above with respect to embedded mitigation, the development design has sought to retain important habitats within the layout as far as possible. However, some habitat loss is unavoidable to make way for the proposed development. The assumed habitat losses during construction have been quantified within the Biodiversity Metric and are described in the Biodiversity Net Gain (BNG) Assessment provided in **Appendix EDP 6**. A full copy of the Biodiversity Metric spreadsheet is available on request.

4.11 Based on the illustrative masterplan and associated landscape proposals, assumptions can be made regarding the habitats present post-development, made up of habitats retained in their current state (with no change), habitats retained and enhanced, and newly created habitats. These assumptions have been quantified within the Biodiversity Metric and details of target habitat condition are set out within the BNG Assessment provided in **Appendix EDP 6**.

4.12 Impacts on existing habitats within the Site, namely loss, retention or enhancement are summarised in **Table EDP 4.1**. Assumptions regarding habitat creation on Site are summarised in **Table EDP 4.2**.

Table EDP 4.1: Summary of On Site Habitat Impacts

Defra Metric 4.0			Existing Area/Length	Area/Length Lost	Area Length Retained	Area/ Length Retained and Enhanced (and details)
Habitat Type	**Distinctiveness**	**Condition**				
Modified grassland	Low	Good	0.3156ha	0.0732ha	-	0.2424ha enhanced to other neutral grassland and lowland meadow
Modified grassland	Low	Poor	2.3674ha	2.1975ha	0.1014ha	0.0685ha enhanced to other neutral grassland
Other neutral grassland	Medium	Moderate	2.5578ha	0.9353ha	0.0825ha	1.54ha enhanced to other neutral grassland (good condition) and lowland meadow
Bramble scrub	Medium	N/A	0.0575ha	0.0333ha	-	0.0242ha enhanced to mixed scrub
Mixed scrub	Medium	Moderate	0.0777ha	0.0041ha	-	0.0736ha enhanced to mixed scrub, good condition
Ponds (non-priority)	Medium	Moderate	0.0146ha	0.0146ha	-	-
Ruderal/Ephemeral	Low	Moderate	0.0358ha	0.0358ha	-	-
Artificial unvegetated, unsealed surface	V.Low	N/A	0.0068ha	0.0068ha	-	-
Developed land; sealed surface	V.Low	N/A	0.633ha	0.633ha	-	-
Vegetated gardens	Low	N/A	0.1725ha	0.1725ha	-	-

Defra Metric 4.0			Existing Area/Length	Area/Length Lost	Area Length Retained	Area/ Length Retained and Enhanced (and details)
Habitat Type	**Distinctiveness**	**Condition**				
Native hedgerow with trees	Medium	Good	0.296km	0.022km	-	0.274km enhanced to species rich hedgerow with trees
Native hedgerow	Low	Moderate	0.082km	-	-	0.082km enhanced to species rich

Table EDP 4.2: Summary of On Site Habitat Creation

Defra Metric 4.0			**Area/Length Created**
Habitat Type	**Distinctiveness**	**Condition**	
Lowland meadows	V.High	Good	0.0038ha
Modified grassland	Low	Moderate	0.5624ha
Other neutral grassland	Medium	Moderate	0.5ha
Traditional orchards	High	Moderate	0.0788ha
Mixed scrub	Medium	Good	0.1925ha
Ponds (non-priority habitat)	Medium	Good	0.0156ha
Artificial unvegetated, unsealed surface	V.Low	N/A	0.05781ha
Bioswale	Low	Good	0.0711ha
Developed land; sealed surface	V.Low	N/A	2.1474ha
Sustainable drainage system	Low	Good	0.2026ha
Vegetated garden	Low	N/A	0.7806ha
Modified grassland	Low	Poor	0.13489ha
Urban tree	Medium	Poor	0.2606ha
Rural tree	Medium	Moderate	0.2646ha
Species-rich native hedgerow	Medium	Moderate	0.129km

4.13 The net effect of all habitat retention, enhancement and creation is described fully within **Appendix EDP 6** and is summarised in **Table EDP 4.3**.

Table EDP 4.3: Net Impact on Habitats

	Habitat Units	**Hedgerow Units**
Total net unit change	3.58	2.90
Total net % change	+10.64%	+65.06%

4.14 Based on the Biodiversity Metric calculations described above the net impact on habitats, following implementation and maturation of the proposed landscaping, is predicted to be positive. However, in the absence of further mitigation measures, there is a risk of the following:

- Damage/deterioration/pollution of retained habitats from adjacent construction activities; and
- Not achieving target condition for retained and new habitats due to inappropriate management.

IMPACTS ON PROTECTED, PRIORITY OR OTHER NOTABLE SPECIES

Breeding Birds

4.15 A number of common farmland bird species within the Site use the boundary scrub, hedgerows and treelines as nesting habitats. Embedded mitigation includes the retention and enhancement of the majority of the hedgerow, treeline and scrub network; however, the scheme will result in the minor loss of hedgerows and treelines to facilitate access across the Site. The scheme will also require the loss of semi-improved grassland habitat, which have the potential to support ground nesting birds depending on the cutting/grazing regime in operation during the breeding season. In the absence of mitigation, this could result in the loss, damage, or disturbance to active bird nests if these works occur within the nesting bird season (April–August inclusive).

4.16 Given the short-term nature of the disturbance impacts (which will primarily occur during the construction phase only through noise, visual and human disturbance) and the limited extent of the permanent habitat loss impacts, such impacts are judged to be minor even in the absence of mitigation.

Bats

Impacts on Roosting Bats

4.17 The single tree on- Site identified as having some, albeit Low, suitability to support roosting bats (labelled as **TN1** on **Plan EDP 1**) is to be removed to make way for the proposed development. This will result in the minor loss of roosting opportunities on Site and, in the absence of further inspections/mitigation, could result in the loss of a bat roost/harm to bats.

4.18 All existing buildings are to be demolished to make way for the proposed development. This will result in the loss of building **B1**, which is assumed to support a summer day roost for a single common pipistrelle bat based on the 2021 survey findings (despite not being recorded in 2023). Owing to the low conservation status of the bat roost, the loss of **B1** will have only a minor impact on the local bat population, however, unless future update surveys rule out the presence of a bat roost, this will require a Natural England EPS Mitigation Licence as discussed further in **Section 5**.

Impacts on Foraging/Commuting Bats

4.19 The automated detector and manual transect surveys have identified a bat population of moderate species diversity across the Site of Local ecological importance. The majority of this activity has been recorded adjacent to the boundary features with only very low levels of activity associated with the interior of the Site.

4.20 Embedded mitigation includes the retention and enhancement of the majority of the hedgerow, treeline and scrub network; however, the scheme will result in the minor loss of hedgerows and treelines to facilitate access across the Site. In the absence of mitigation, the proposed habitat loss will result in a small extent of fragmentation and loss of bat commuting routes, and the temporary loss of suitable foraging habitat. In addition, new streetlighting could potentially result in light spill on bat foraging/commuting habitat and deter bats from using them.

4.21 Given the distribution and number of bats within the Site, particularly those of conservation importance, it is not considered likely that the Site forms a core part of their foraging and commuting habitat. In light of this, the extent of habitat loss potentially required for development would likely result in a minor impact to the local bat assemblage.

Badger

4.22 No setts or evidence of badger activity have been recorded within or near to the Site, such that no impacts on badgers are currently anticipated. However, the future presence of this species (and therefore impacts from development) cannot be ruled out due to the presence of suitable habitats and the species' widespread distribution.

Other Mammals

4.23 The Site supports habitats suitable for foraging and commuting hedgehogs, including field margins and hedgerows. In the absence of suitable mitigation, vegetation clearance works could result in direct harm to hedgehogs. However, given the small-scale and mostly temporary nature of the suitable habitat loss, the construction works are considered unlikely to significantly impact upon the local hedgehog population.

Reptiles

4.24 Small populations of common lizard and grass snake have been recorded within the Site, primarily located along the north-western and south-western boundaries. Currently, the field interiors provide sub-optimal habitat for reptiles owing to grazing by horses for some or all of the year.

4.25 In the absence of mitigation, reptiles could be harmed during clearance of rough grassland and scrub habitats, and the population could experience a long-term reduction in suitable habitat post-development. However, given the green space proposed on the western edge of the proposed development, there is a high probability that a large proportion of the habitat that has been found to support reptiles can be retained during the construction process. Impacts on the local reptile population are therefore judged to be minor.

Section 5
Mitigation and Enhancement Strategy

5.1 This section of the Ecological Appraisal considers the impacts set out in **Section 4** and puts forward additional measures to firstly avoid any ecological impact, and if this is not possible then to minimise the likely impacts of the proposed development to insignificant levels, to comply with relevant planning policy and avoid any infringement of relevant legislation.

5.2 This section also sets out proposed ecological enhancements for the Site, in line with the requirements of the NPPF and the adopted Cherwell Local Plan, for developments to contribute to and enhance the natural and local environment.

DESIGNATED SITES

5.3 The only nationally designated site which is at risk of adverse impacts from the proposed development is Bure Park LNR. Such potential impacts relate to pollutants entering the local watercourse from surface water run off during construction and travelling downstream to Bure Park LNR. The risk of adverse impacts is very low, however, and can be avoided through sensitive construction practices relating to management of surface water and pollution prevention. Such measures can be implemented via a Construction Environmental Management Plan (or similar) which is capable of being secured by a planning condition.

5.4 For the reasons set out in **Section 4**, no adverse impacts on non-statutory designations are anticipated such that no additional mitigation measures are proposed.

5.5 Subject to the implementation of the measures summarised above, impacts on designated site will be avoided or reduced to insignificant levels, such that the development can be delivered in accordance with relevant planning policy.

HABITATS

5.6 Measures will be required to protect the retained habitats described in **Section 4** from damage and disturbance during the construction phase. This can be achieved through a combination of the following:

1. Tree protection measures (for woodland, trees and hedgerows), to be detailed within an Arboricultural Method Statement (AMS) or an equivalent document;

2. Additional physical protection for wider habitats such as grasslands and water courses, to be detailed within an Ecological Construction Method Statement (ECMS) or an equivalent document. The ECMS will define Ecological Protection Zones (EPZs), in which construction activities will be excluded or carefully controlled in order to avoid or minimise harm to habitats; and

3. General environmental protection measures, including control of dust and other pollutants, to be detailed in a Construction Environmental Management Plan (CEMP).

5.7 The AMS, ECMS and CEMP are standard documents which are capable of being secured by planning conditions.

5.8 Detailed specifications for new planting and other habitat creation described in **Section 4** should be provided with a detailed Soft Landscaping Scheme secured by planning condition. In addition, measures to restore and enhance existing habitats, to ensure successful establishment of new habitats, and to maintain the value of all ecological features in the long-term will be delivered through a Landscape and Ecology Management Plan (LEMP), or an equivalent document, which can be secured by planning condition.

5.9 Subject to the implementation of the measures summarised above, impacts on retained habitats will be avoided and the net gains in biodiversity predicted within the BNG Assessment (see **Appendix EDP 6**) will be achieved in accordance with relevant planning policy.

PROTECTED, PRIORITY OR OTHER NOTABLE SPECIES

Breeding Birds

5.10 The habitat protection measures described above will avoid harm to breeding birds present with retained habitats. However, some removal of hedgerows, scrub, trees and rough grass, which are capable of supporting nesting birds, will be required to facilitate the development. Any removal of these habitats should be undertaken between September and February inclusive to avoid the bird breeding season. Any habitat removed outside of this period should be inspected by a suitably experienced ecologist prior to removal. These measures can be delivered through the ECMS.

5.11 The proposed enhancement of the existing hedgerows; planting of new trees, shrubs and hedgerows; the development of more species-rich and structurally diverse grassland, and creation of new wetlands in the SuDS basins will together enhance opportunities for foraging and nesting birds post-development.

5.12 Further enhancement of bird nesting opportunities can be achieved through installation of bird boxes/bricks on retained trees and/or on new buildings. These measures/specifications can be delivered through the LEMP.

Bats

Roosting Bats

5.13 In line with best practice, the removal of the tree with Low suitability for bat roosting will follow a soft felling methodology under the supervision of a Natural England bat licensed ecologist. Soft felling involves the removal of the tree in sections working from the top downward, and leaving cut limbs on the ground over night to allow any bats potentially present to make their way out. This can be secured via the ECMS.

5.14 Unless future update surveys rule out the presence of the previously recorded bat roost within building **B1**, the demolition of this building will require Natural England EPS Mitigation Licence to derogate from the legal protection afforded to bat roosts by the Conservation of Habitats and Species Regulations 2017 (as amended). The licence will need to be supported by a Method

Statement detailing the sensitive methods and timings for stripping any potential roost features prior to demolition and the proposed replacement roosting habitat to be provided to maintain the favourable conservation status of the species in question (in this case, bat boxes would be appropriate for common pipistrelle).

5.15 In addition to the above, enhancement of bat roosting opportunities within the Site can be achieved through installation of bat boxes/bricks on retained trees and/or on new buildings. These measures/specifications can be delivered through the LEMP.

Foraging/Commuting Bats

5.16 The protection of retained habitat which is suitable for foraging and commuting bats can be delivered via the ECMS.

5.17 The proposed enhancement of the existing hedgerows; planting of new trees, shrubs and hedgerows; the development of more species-rich and structurally diverse grassland, and creation of new wetlands in the SuDS basins will together enhance opportunities for foraging bats post-development.

5.18 In addition to the above, a sensitive lighting scheme should be devised at the detailed design/Reserved Matters stage, which minimises light spill from street lighting onto retained/new bat foraging habitat adjacent to the development area. Such a lighting scheme can be secured by planning condition.

Badger

5.19 No badger setts or other evidence of badger activity have been recorded within or near to the Site such that, at present, no mitigation measures are required. However, given the suitability of habitats within the Site, and the potential for new badger setts to be become established in relatively short timescales, it is proposed that an update badger survey is undertaken no more than 12 months prior to enabling/construction works commencing. This can be secured via the ECMS.

Reptiles

5.20 The majority of the core habitat found to support reptiles within the Site (on the north-western and south-western boundaries) is to be incorporated into proposed green space, with a sufficient buffering from the proposed development such that it should be possible to retain this habitat during the construction phase. Physical protection of this habitat (i.e. through appropriate fencing and signage) to avoid potential harm to reptiles can be achieved via the ECMS and secured by planning condition.

5.21 As the remaining areas of reptile habitat that cannot be retained are limited in extent, it is not considered proportionate to undertake a capture and translocation exercise. Instead, it is proposed that phased clearance is undertaken of potentially suitable grassland, scrub and hedgerow habitat, whereby the vegetation first is to cut to a height of c. 150mm, checked by a suitably experienced ecologist to ensure that any reptiles have dispersed from the area and before being cut to ground level and rendered unsuitable. Where potential hibernation habitat is to be cleared, the technique above is appropriate but should avoid the main reptile

hibernation period (November to February inclusive). Such measures can be achieved via the ECMS and secured by planning condition.

5.22 Retained reptile habitats, and new habitats created as part of the soft landscape scheme post-development should be managed sensitively to ensure they are suitable for reptiles in the long-term i.e. by avoiding regular cutting during the active reptile season to promote a dense, tussocky sward which transitions into scrub/hedgerow/woodland.

Other Species

5.23 As noted in **Section 4**, rough grass, scrub and hedgerows habitats within the Site could also potentially support hedgehogs and amphibians. However, the sensitive vegetation clearance technique proposed above in relation to reptiles will ensure that potential harm to such species during site clearance is avoided.

Section 6
Summary and Conclusions

6.1 **Table EDP 6.1** provides an overview of Mitigation and Enhancement Strategy described in **Section 5**.

Table EDP 6.1: Summary of Proposed Mitigation and Enhancement

Mitigation Type	Key Principles	Mechanism(s) to Secure Delivery
Avoid by design	Retention of habitats with appropriate development buffers: • Existing hedgerows, scrub and trees; and • Existing semi-improved grassland.	Habitat retention embedded in the Illustrative Masterplan, which will be an 'approved plan' to which future detailed designs must align
Avoid or minimise construction impacts	Sensitive methods of operation during enabling and construction works: • Surface water management; • Storage of fuels/chemicals; and • Sensitive lighting.	CEMP secured via pre-commencement planning condition.
	Protection of retained habitats - fencing and signage to create development exclusion zones.	AMS and ECMS secured via pre-commencement planning condition.
	Methods to avoid harming individuals or interfering with breeding of protected species prior to/during habitat destruction: • Pre-commencement checks/surveys; • Timings to avoid sensitive periods/breeding seasons; • Phased vegetation clearance; and • Supervision by Ecological Clerk of Works (ECoW).	ECMS secured via pre-commencement planning condition. Detailed Method Statement for bats submitted as part of EPS licence application.

Mitigation Type	Key Principles	Mechanism(s) to Secure Delivery
Mitigate or compensate for habitat loss and deliver net gains	Habitat enhancement: • Semi-improved neutral grassland to lowland meadow with no public access; • Semi-improved neutral grassland from moderate to good condition; and • Pond and scrub from moderate to good condition. Habitat creation: • Orchard planting; • Scrub and tree planting; • Wildlife pond; • Neutral grassland; and • SuDS features.	Space for new habitat embedded in the Illustrative Masterplan, which will be an 'approved plan' to which detailed designs must align. LEMP to be secured by planning condition.
	Habitat features to be provided in suitable locations: • Bird boxes; and • Bat boxes and/or bat bricks.	LEMP to be secured by planning condition. Measures for bats submitted as part of EPS licence application.
	Lighting strategy to avoiding disturbance of nocturnal species, in particular foraging/commuting bats	Detailed lighting design to be secured by planning condition.
Maintenance, Monitoring and Management post-construction	Habitat-specific, namely measures to: • Enhance retained habitat, and to ensure new habitat becomes established, to achieve target condition; and • Monitor and maintain habitats in good ecological condition once enhanced/established.	LEMP to be secured by planning condition.

6.2 EDP concludes that, in light of the embedded mitigation and subject to the full implementation of the additional measures summarised above, the proposed development is capable of compliance with relevant planning policy and legislation and can deliver net benefits for wildlife and biodiversity.

Appendix EDP 1
Extended Phase 1 Habitat Survey

METHODOLOGY

Extended Phase Habitat Survey

A1.1 The survey technique adopted for the Extended Phase 1 Habitat survey was at a level intermediate between a standard Phase 1 survey technique, involving habitat mapping and description, and a Phase 2 survey, based on detailed habitat and species surveys. The survey involved identifying and mapping the main habitat types (including Priority habitats) and scoping any potential protected or priority species populations. This level of survey is not intended to compile a complete floral and faunal inventory for the Site.

A1.2 The Extended Phase 1 Habitat survey was undertaken by a suitably experienced surveyor on 20 July 2021. An update Extended Phase 1 Habitat survey was undertaken on 10 July 2023, during which the weather was mild and dry.

Limitations

A1.3 The Extended Phase 1 surveys have been undertaken in June and July which is within the optimal survey window for habitat surveys. Therefore, these surveys are not considered to be constrained.

RESULTS

A1.4 The principal habitats within the Site together with their dominant/characteristic plant species identified during the surveys are discussed in turn below. The type, distribution and species composition of the habitats present is discussed below.

A1.5 The following should be read in conjunction with **Plan EDP 1** and illustrative photographs provided.

Species-poor Semi-improved Grassland

A1.6 Fields **F1**, **F2**, **F4**, **F5**, **F6**, **F8** and **F9** within the Site comprise relatively species-poor, semi-improved grassland. During both walkovers, the fields have consistently been of a short sward height, c. 5 to 10cm tall, due to being grazed for horses. The sward dominated by common grass species. Perennial rye-grass (*Lolium perenne*), false-oat grass (*Arrhenatherum elatius*) and Yorkshire (*Holcus lanatus*) are abundant with occasional annual meadow-grass (*Poa annua*). Herbaceous species are present but not abundant and include white clover (*Trifolium repens*), daisy (*Bellis perennis*), common dandelion (*Taraxacum officinalis*), yarrow (*Achillea millefolium*), creeping buttercup (*Ranunculus repens*) and ribwort plantain (*Plantago lanceolata*). Fields **F4** and **F6** supported additional species including occasional soft brome (*Bromus hordeaceus* ssp. *hordeaceus*), black medic (*Medicago lupulina*) and creeping bent (*Agrostis stolonifera*). An overview of field can be seen in **Image EDP A1.1**.

A1.7 Given the limited structural and botanical diversity within these grasslands, these are considered to be of Site-level importance only.

Image EDP A1.1: An overview of **F4**.

Semi-improved Neutral Grassland

A1.8 Fields **F3** and **F7** comprise semi-improved neutral grassland which are tussocky with average heights between 30 to 70cm tall. **F7** has consistently comprised of semi-improved neutral grassland during both the 2021 and 2023 surveys whilst **F3** was previously considered to comprise horse-grazed species-poor semi-improved grassland however, this grassland is now considered to be neutral grassland. The change in grassland composition and condition is likely a result of a reduction in grazing pressure which has enabled a greater diversity of herbaceous species to establish.

A1.9 Grasses present within both grasslands includes frequent Yorkshire fog, common bent (*Agrostis stolonifera*), false-oat grass, occasional wild barley (*Hordeum spontaneum*) and perennial rye-grass. Herbaceous species present but not abundant include field bindweed (*Convolvulus arvensis*), lesser stitchwort (*Stellaria graminea*), common ragwort (*Senecio jacobaea*), fat hen (*Chenopodium album*), creeping thistle (*Cirsium arvense*), smooth sow-thistle (*Sonchus oleraceus*), yarrow, white clover common goat's-beard (*Tragopogon pratensis*) and rib plantain (*Plantago lanceolata*).

A1.10 Field **F3**, also supports a number of additional species including locally frequent lady's bedstraw (Galium verum), greater knapweed (*Centaurea scabiosa*), common birds-foot trefoil (*Lotus corniculatus*), soft brome and common bent with occasional cut-leaved cranesbill (*Geranium dissectum*), crested dogs-tail (*Cynosurus cristatus*), red clover (*Trifolium pratense*),

wild barley and common knapweed (*Centaurea nigra*). An overview of field **F19** can be seen in **Image EDP A1.2**.

A1.11 Given the limited structural and botanical diversity within the grasslands; these are considered to be of Site-level importance only.

Image EDP A1.2: Semi-improved neutral grassland within **F3**.

Semi-natural Mixed Woodland

A1.12 A small section of semi-natural mixed woodland (**W1**) falls within the Site and an overview of the woodland can be seen in **Image EDP A1.3**. The section of woodland within the Site includes field maple (*Acer campestre*), aspen (*Populus tremula*), larch species (*Larix* sp.), silver birch (*Betula pendula*), rhododendron species (R*hododendron sp*.) and willow (Salix sp.). Given the limited structural and botanical diversity within the woodland, this is considered to be of Site-level importance only.

Image EDP A1.3: Woodland **W1**.

Scrub

A1.13 Scattered and dense scrub is present within the field margins where the field margins have been left unmanaged as can be seen in **Image EDP A1.4**. Bramble (*Rubus fruticosus agg.*) is dominant with occasional hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), willow species (*Salix* spp.) and blackthorn (*Prunus spinosa*), and tall ruderals such as common nettle (*Urtica dioecia*), broadleaved dock (*Rumex obtusifolius*) and common hogweed (*Heracleum sphondylium*) are also present. The extent of tall ruderals within the field margins has marginally increased between the 2021 and 2023 surveys.

A1.14 Scrub on Site is considered to be of Site-level ecological importance given its limited extent and diversity.

Image EDP A1.4: Scattered scrub towards the Site peripheries.

Tall Ruderal

A1.15 Small pockets of tall ruderal vegetation are present within the scrub and along the field boundaries. Small pockets of tall ruderal have also established on areas of raised earth bunds at Target Note **TN2** (**Plan EDP 1**). The extent of tall ruderals within the field margins has marginally increased between the 2021 and 2023 surveys.

A1.16 Common nettle, common hogweed, broad-leaved dock, common burdock (*Arctium minus*), spear thistle (*Cirsium vulgare*), perennial sow-thistle (*Sonchus arvensis*), cleavers (*Galium aparine)* and creeping thistle are present. A number of herbs and grasses are also intermixed including false oat-grass, annual meadow-grass, cut-leaved cranesbill (*Geranium dissectum*) and creeping buttercup. An example area of tall ruderals can be seen in **Image EDP A1.5**.

A1.17 Tall ruderals on Site are considered to be of Site-level Importance given their limited structural and botanical diversity.

Image EDP A1.5: Tall Ruderals towards the Site peripheries.

Amenity Planting

A1.18 Amenity planting comprising of mown amenity lawn and introduced shrubs is present within the garden adjacent to **B1**. The mown amenity lawn is species-poor; being dominated by perennial rye-grass with occasional white clover and annual meadow-grass.

Image EDP A1.6: An overview of the garden adjacent to **B1**.

Standing Water

A1.19 Two waterbodies are located within the Site and a further three ponds are located within 500m of the Site. Detailed descriptions and assessments of their suitability to support great crested newts can be found in **Appendix EDP 5**.

A1.20 Pond **P1** comprises of a small, shallow depression which primarily supports little to no water except during periods of high rainfall. An overview of pond **P1** can be seen in **Image EDP A1.7**. Pond **P2** comprises of a medium sized garden pond which supports a modest number of fish including carp species. An overview of pond **P2** can be seen in **Image EDP A1.8**. The waterbodies are considered to be of at least Site-level importance given their location within the ecological network on Site.

Image EDP A1.7: Pond **P1**.

Image EDP A1.8: Pond **P2**.

Building

A1.21 South lodge comprises of a complex of buildings, including an occupied farmhouse and a number of horse stables. Built structures present on and adjacent to the Site are considered to be of negligible intrinsic importance, although their suitability for roosting bats is considered further in **Appendix EDP 4**.

Hardstanding/Bare Ground

A1.22 A tarmacked access track is present through the Site and small areas of bare earth is present across the Site as can be seen in **Image EDP A1.9**. This habitat is of negligible ecological value.

Image EDP A1.9: Tarmacked access track through the Site.

Hedgerows

A1.23 Three hedgerows are present on Site and these are all managed, intact and support native shrub species.

A1.24 Hedgerow **H1** is an intact species-poor hedgerow with trees which supports blackthorn, hawthorn, ash (*Fraxinus excelsior*), field maple and crab apple (*Malus sylvestris*).

A1.25 Hedgerow **H2** is an intact species-poor hedgerow which supports hawthorn, field maple, sycamore (*Acer pseudoplatanus*), ash, elder and blackthorn.

A1.26 Hedgerow **H3** is an intact species-poor hedgerow with trees which supports hawthorn, field maple, sycamore, ash, elder and blackthorn.

Image EDP A1.10: Hedgerow **H1**.

Image EDP A1.11: Hedgerow **H2**.

Scattered Trees

A1.27 Scattered broadleaved trees are present adjacent to the access track onto Site and intermixed with the hedgerows on the Site. Species present includes horse chestnut, elder and silver birch. A coniferous treeline dominated by leylandii (*Cupressocyparis leylandii*) is also runs through the

centre of the Site. A full assessment of trees was undertaken with regards to their potential to support roosting bats, these details are provided in **Appendix EDP 3**.

Appendix EDP 2
Hedgerow Survey

METHODOLOGY

A2.1 An assessment of the entire hedgerow network on Site was undertaken on 20 July 2021 and updated on 10 June 2023 to determine their importance with reference to the Wildlife and Landscape criteria provided in Part II of Schedule 1 of the Hedgerows Regulations 1997. 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 via a Hedgerow Removal Notice or as part of a planning permission.

A2.2 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.

A2.3 A total of three hedgerow sections located within or adjacent to the Site were surveyed against the Hedgerows Regulations 1997 criteria. 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 the central 30m of each half of hedgerows up to 200m in length were surveyed. For hedgerows exceeding 200m in length, the central 30m section from each third of the hedgerow was 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.

A2.4 Qualifying as important under the ecological criteria requires the hedgerow to be greater than 30 years of age.

A2.5 Further to this a Hedgerow should be considered important should if it satisfies any of the following criteria:

- Must either contain (or have a record of having contained) species listed in Schedule 5 (animals) or 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; or
- Contains one of the following criteria per average 30m section surveyed:
    - Seven Schedule 3 (woody) species;
    - Six Schedule 3 species and three listed features (see below);

- Six Schedule 3 species, including one of the following – black poplar (*Populus nigra* subsp. *betulifolia*), large-leaved lime (*Tilia platyphyllos*), small-leaved lime (T*ilia cordata*) or wild service-tree (*Sorbus torminalis*); or
- Five Schedule 3 species and four listed features; or
- Four Schedule 3 species, two listed features and lying adjacent to a bridleway or footpath; with
- Listed features are:
    a) A bank or wall which supports the hedgerow along at least one half of its length;
    b) Gaps which in aggregate do not exceed 10% of the length of the hedgerow;
    c) Where the length of the hedgerow does not exceed 50 metres, at least one standard tree;
    d) Where the length of the hedgerow exceeds 50 metres but does not exceed 100 metres, at least 2 standard trees;
    e) Where the length of the hedgerow exceeds 100 metres, such number of standard trees (within any part of its length) as would when averaged over its total length amount to at least one for each 50 metres;
    f) At least 3 woodland species within one metre, in any direction, of the outermost edges of the hedgerow;
    g) A ditch along at least one half of the length of the hedgerow;
    h) Connections scoring 4 points or more; and
    i) A parallel hedge within 15 metres of the hedgerow.

A2.6 It is recognised that, with reference to the Hedgerows Regulations (1997), certain animal species listed in the Wildlife and Countryside Act or by the JNCC that could result in a hedgerow being recognised as important, may have gone unrecorded due to the timing and nature of the survey. Indeed, the use of the hedgerow by such species may be seasonal or at particular periods during the day. Whilst the full survey of such species falls outside the scope of the hedgerow survey, incidental sightings recorded during the hedgerow survey and records retrieved during the desk study were re-assessed for these species. In addition, data gained through relevant protected species surveys has also been considered.

Limitations

A2.7 The surveys have been undertaken in July which is within the optimal survey window for these habitats. As such, the surveys are not considered to be constrained.

RESULTS

A2.8 The detailed results of the hedgerow surveys undertaken are provided in **Table EDP A2.1**. The location of hedgerows assessed within the Site is shown in **Plan EDP 1**.

A2.9 In summary, of the hedgerows surveyed, none of the hedgerows qualified as 'important' under the Hedgerows Regulations (1997) criteria.

A2.10 All hedgerows within the Site are considered to be Priority habitats as consist predominantly (80% or more) of at least one woody UK native species.

A2.11 The hedgerows on Site have inherent ecological value and also have value because they support, or are likely to support, a range of protected and notable species. However, hedgerows of this nature are very common within the District, so are only considered to have Local level importance.

Table EDP A2.1: Hedgerow Survey Results

Hedgerow number	Schedule 3 species recorded	Mean Count of Schedule 3 Species	Number of Schedule 2 Woodland Plants	Bank/ Wall Present	Any Gaps are less than 10%	Standard Trees (min. 1/50m)	Ditch	Connections (4 or >4)	Parallel Hedge	Adjacent footpath, Bridleway, Road Used as Path, or BOAT	Contains rare or notable species	Important Hedgerow
1	Hawthorn, blackthorn, field maple, sycamore, ash and elder.	4	0	N	Y	Y	N	0	N	N	N	N
2	Blackthorn, hawthorn, ash, field maple and crab apple.	4	0	N	Y	Y	N	0	N	N	N	N
3	Hawthorn, blackthorn, field maple, sycamore, ash and elder.	4	0	N	Y	Y	N	0	N	N	N	N

Appendix EDP 3
Bat Surveys

METHODOLOGY

A3.1 The scope of bat surveys undertaken at the Site was determined following completion of the Extended Phase 1 Habitat survey and review of relevant desk study findings and with reference to best practice guidelines published by the Bat Conservation Trust[23].

Bat Roost Surveys

Preliminary Roost Assessment of Trees

A3.2 Owing to the presence of suitably mature trees within or adjacent to the Site, a preliminary ground level roost assessment of these trees was undertaken to record any external evidence of roosting bats or any features capable of supporting roosting bats.

A3.3 The survey was completed on 20 July 2023 and updated-on 12 July 2023 by a bat licensed ecologist in accordance with the best practice guidelines referred to above. The trees were searched as thoroughly as possible from ground level with all elevations covered where these could be accessed.

A3.4 Suitable features for roosting bats recorded (where present) include the following:

- Loss/peeling/fissured bark;
- Natural holes e.g., rot holes, cavities and wounds from fallen limbs;
- Woodpecker holes;
- Cracks/splits or hollow tree trunks/limbs;
- Bat, bird or dormouse boxes; and
- Crevices formed by thick-stemmed ivy.

A3.5 Signs of roosting bat presence recorded (where present) include the following:

- Bat/s roosting *in situ*;
- Bat droppings within, around or beneath a potential roost feature;
- Staining around or beneath a feature;
- Audible squeaking from the roost at dusk or during warm weather; and

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

- Large/regularly used roosts or may produce a distinctive odour.

A3.6 Based upon the evidence/features identified, each tree was assigned to one of the following categories:

- Known or confirmed roost - EPS licence likely to be required for works to tree to be completed lawfully;
- High suitability – One or more potential roost features present that are obviously suitable for use by larger numbers of bats on a more regular basis, and potentially for longer periods of time;
- Moderate suitability - One or more potential roost features present that could be used by bats but are unlikely to support a roost type of high conservation status (with respect to roost type only);
- Low suitability - A tree of sufficient size and age to contain potential roost features but with none seen from the ground, or features seen but with only very limited roosting potential; and
- Negligible suitability - No potential to support roosting bats.

Limitations

A3.7 As with any ground level assessments of trees, certain features may not be visible or fully visible from the ground. Tree assessments can be undertaken at any time of year but is best undertaken in winter/early spring when visibility into the crown of the tree is improved due to the absence of leaves. Due to the number and nature of the trees on Site, the surveys are not considered to be constrained.

A3.8 Bats are mobile animals and will move between a series of different tree roost sites, frequently establishing and occupying different potential roost features, depending on seasonal requirements and resources available locally. Furthermore, existing potential roost features on trees can be transient and new features formed regularly. This survey, therefore, only provides a snapshot of the conditions present at the Site at the time of survey.

A3.9 It should be noted that this type of assessment is based on features visible from ground level and is not considered to be a definitive bat roosting survey.

Preliminary Roost Assessment of Buildings

A3.10 Owing to the presence of potentially suitable buildings within or adjacent to the Site, a preliminary roost assessment of these buildings and structures was undertaken to record any evidence of roosting bats or any features capable of supporting roosting bats.

A3.11 The survey was completed initially on 20 July 2021 and updated on 10 July 2023 by a bat licensed ecologist and assistant in accordance with the best practice guidelines referred to above. All external features considered potentially suitable for bats were assessed using a high-powered torch and binoculars, from all aspects, where access allowed. In addition, an internal inspection of the buildings (including roof voids) was undertaken during the 20 July 2021 survey where access was possible.

A3.12 Suitable features for roosting bats recorded (where present) include the following:

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

A3.13 Signs of roosting bat presence recorded (where present) include the following:

- Bat(s) roosting *in situ*;
- Bat droppings or urine splashes within or beneath a feature/access point;
- Feeding remains (e.g. insect wings and beetle wing cases);
- Oily marks, smoothly worn surfaces or staining around a feature/access point;
- Audible squeaking from the roost; and
- Large/regularly used roosts may produce a distinctive odour.

A3.14 Based upon the evidence/features identified, each building was assigned to one of the following categories:

- Known or confirmed roost –EPS licence may be required for modifications, and will be required for demolition, to be completed lawfully;
- High suitability – Structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat;
- Moderate suitability – Structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only);
- Low suitability – Structure with one or more potential roost sites that could be used by individual bats opportunistically. These roost sites do not provide enough space, shelter, protection, appropriate conditions and suitable surrounding habitat to be used on a regular basis or by larger numbers of bats; and
- Negligible suitability – No potential to support roosting bats.

Limitations

A3.15 Preliminary roost assessments of buildings can be undertaken at any time of year and these assessments were therefore not limited by seasonal or climatic factors.

Dusk Emergence/Dawn Re-entry Surveys

A3.16 Owing to the presence of buildings with features suitable for roosting bats which are at risk of impacts from development, dusk emergence surveys of these buildings were conducted in accordance with the best practice guidelines referred to above. The date and type of surveys conducted on each relevant building (see **Plan EDP 5** for building reference numbers) are set out in **Table EDP A3.1**.

Table EDP A3.1: Dusk Emergence Surveys

Building Reference	Date	Dusk/Dawn	Number of Surveyors/or Infrared Cameras
B1 and **B2**	20.07.2021	Dusk	5 surveyors
B1	17.08.2021	Dusk	5 surveyors
B1	13.07.2023	Dusk	4 surveyors
B1	14.08.2023	Dusk	4 surveyors

A3.17 During each survey, suitably qualified ecologists were positioned in appropriate locations, as shown on **Plan EDP 5**, so that all the relevant building elevations/features could be observed. The dusk surveys commenced 15 minutes prior to sunset and continued until at least one and a half hours after as per best practice guidelines. The surveyors used Elekon Batlogger M bat detectors to record the echolocation calls of any bats observed during the survey. The weather conditions were generally suitable for such surveys, as detailed in **Table EDP A3.2**.

Table EDP A3.2: Weather Conditions During Emergence Surveys

Survey Date	Sunset Time	Start-Finish Time	Temperature (°C)	Cloud Cover (%)	Wind (Beaufort)	Precipitation
20.07.2021	21:12	S: 20:57 F: 22:42	21–27	0	0	Nil
17.08.2021	20:25	S: 20:10 F: 21:55	19–20	0–1	0–1	Nil
13.07.2023	21:19	S: 21:04 F: 22:49	17–19	0–5	0–1	Nil
14.08.2023	20:30	S: 20:15 F: 22:00	15–19	0–60	2–3	Nil

A3.18 All sonogram recordings made during the dusk/dawn surveys were later analysed using BatExplorer sound analysis software to confirm species identification.

Limitations

A3.19 All surveys were undertaken under suitable weather conditions at an appropriate time of year and as such are not considered to be limited by seasonal or climatic factors.

Bat Activity Surveys

A3.20 During the Extended Phase 1 Habitat survey, an initial assessment was undertaken of suitability of the habitats within and immediately adjacent to the Site for foraging and commuting bats. In accordance with the best practice guidelines referred to above, the Site was assigned to one of the following categories:

- High suitability – Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, treelined watercourses and grazed parkland. Site is close to and connected to known roosts;

- Moderate suitability – Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water;

- Low suitability – Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub; and

- Negligible suitability – Negligible habitat features on Site likely to be used by commuting or foraging bats.

A3.21 Having determined that the overall suitability of the Site is Low, a proportionate level of survey effort was expended in terms of the number and frequency of manual transect surveys and automated detector surveys. These are described in further detail below.

Transect Surveys

A3.22 Manual transect surveys were undertaken across the Site with the objective of identifying important foraging areas and/or commuting routes used by bats. A single dusk survey was undertaken in July 2021 and a total of three update dusk surveys were undertaken over the course of the active bat season in 2023, in June, July and September.

A3.23 Details of the survey type, date, timing, and weather conditions during each of the transect surveys are given in **Table EDP A3.3**. All visits were completed in weather conditions that were suitable for such surveys.

Table EDP A3.3: Date, Timing and Weather Conditions during Transect Surveys

Survey Date	Sunset/ Sunrise Time	Start - Finish Time	Weather Conditions			
			Temp (°c)	Cloud Cover (%)	Wind (Beaufort Scale)	Precipitation
14.07.21	21:18	S: 21:18 F: 23:18	18–20	0–20	0–1	Nil
10.06.23	21:27	S: 21:27 F: 23:27	18–19	10–50	0–1	Nil
24.07.23	21:07	S: 21:07 F: 23:07	15–18	70–80	1	Nil
17.10.23	18:07	S: 18:07 F: 20:07	10-11	30-50	2-3	Nil

A3.24 During each survey a single transect route was walked covering the most suitable foraging or commuting habitats on the Site; namely mixed woodlands, hedgerows, scrub and grassland. The transect routes are illustrated on **Plan EDP 6**. The transect routes were walked by experienced bat surveyors and an assistant at a slow and steady pace for two hours after sunset or two hours before sunrise. All bats were recorded, and their behaviour marked on survey maps, in order to characterise the value of the Site and its component habitats for foraging and commuting bats.

A3.25 The transect surveys were conducted using Elekon Batlogger M bat 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 tell apart solely from their echolocation calls and were therefore grouped as such.

Limitations

A3.26 Minor deviations to the standard transect routes were made during the surveys due to the presence of livestock. This is not considered to have significantly affected the results as the surveys still covered the most ecologically valuable features on Site.

Automated Detector Surveys

A3.27 To supplement the bat transect survey data, bat activity within the Site was also sampled using Anabat Express detectors (hereafter referred to as 'automated detectors'), which are deployed in fixed locations to automatically trigger and record bat echolocation calls over multiple nights at a time. In this case, automated detectors were deployed at two locations within the Site during each survey, as shown on **Plan EDP 6**, which were judged to be representative of the habitats within the Site. The automated detectors were fixed in secure locations, with an external microphone attached circa 1-2m above ground, where possible, and directed away from the tree/branch to maximise detection sensitivity. A single dusk survey was undertaken in July 2021 and a total of three update surveys were undertaken over the course of the active bat season in 2023, each comprising sampling by automated detectors for at least five

consecutive nights. Details of dates, sampling locations and weather conditions during each of the surveys are given in **Table EDP A3.4**.

Table EDP A3.4: Automated Detector Survey Details

Sampling Period Dates	Location (Reference number and OS grid reference)	Microphone	
		Height	Direction
05.07.21 – 09.07.21	Location 1: SP 58236 25008	2	North
	Location 2: SP 58580 25013	1.5	North
09.06.23 – 13.06.23	Location 1: SP 58221 25017	1.5	North
	Location 2: SP 58580 25013	2	North
19.07.23 – 23.07.23	Location 1: SP 58221 25023	1.74,	North-east
	Location 2: SP 58580 25013	1.6	South-west
24.08.23 – 28.08.23	Location 1: SP 58221 25023	1.8	East
	Location 2: SP 58570 25009	1.8	North
21.09.23 – 25.09.23	Location 1: SP 58230 25014	2.0	North
	Location 2: SP 58573 25009	2.0	West

A3.28 The sound files recorded by the automated detectors were filtered for each of the UK's bat species/species groups using Anabat software's filter function. The parameters for the species filters are based on those proposed by Chris Corben and Kim Livengood[24] and have been fine-tuned using known call parameters for each of the species. All files passing the various filters plus approximately 10% of files that did not pass any species filters (noise files) were checked manually using sonogram analysis in accordance with published guides to confirm the species identification of each bat call.

Limitations

A3.29 The identification of calls and species using Anabat software is dependent upon the quality of the recording made which can be influenced by the following factors, which may limit levels of activity and species recorded:

[24] Taken from Analook W training course and workshop, September 2013

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

RESULTS

Bat Roost Surveys

Preliminary Roost Assessment of Trees

A3.30 The preliminary ground level roost assessment of trees identified one tree with Low suitability to support roosting bats. This is labelled **TN1** on **Plan EDP 1**.

A3.31 This a dead tree (species unconfirmed) that supports minor areas of flaking bark on the main trunk of low to negligible suitability. See **Image EDP 3.1**.

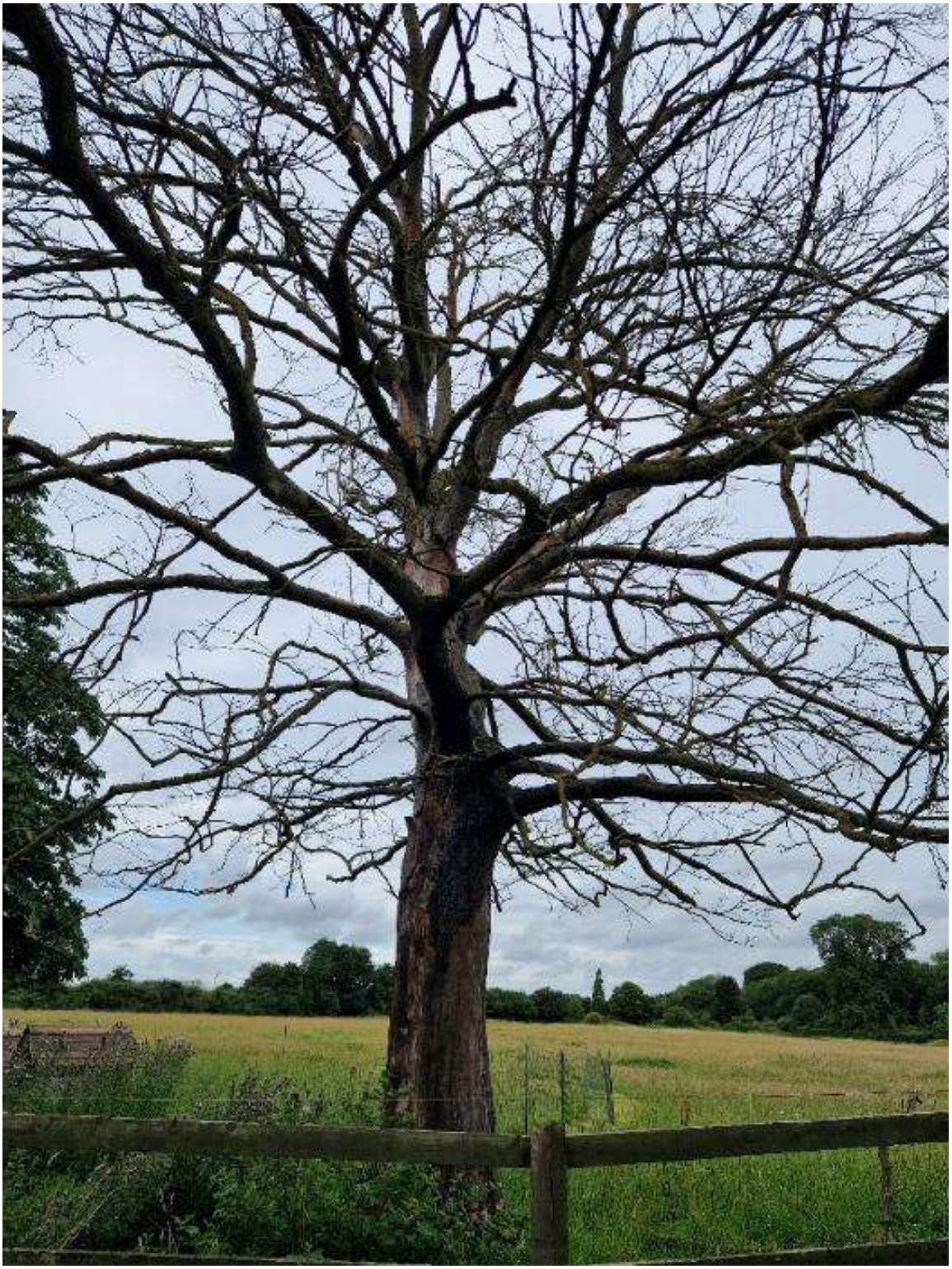

Image EDP A3.1: Tree with Low suitability to support roosting bats.

A3.32 All other trees were found to be of negligible suitability for roosting bats and have not been mapped/described.

Preliminary Roost Assessment of Buildings

A3.33 The preliminary roost assessment/inspection of buildings in 2021 identified a total of two buildings with suitable features for bat roosting, of this total, one building was classified as a

confirmed roost due to containing bat droppings and one was considered to be of Low suitability. The remaining five buildings and two structures on Site were considered to be of negligible suitability for roosting bats.

A3.34 During the update building inspections in 2023, no significant changes to the condition of the buildings was noted, however, the suitability of the features on **B1** and **B2** is considered to have reduced due to the installation of external lighting which has resulted in significant light spill on these features.

A3.35 Further details on each of the buildings inspected are provided in **Table EDP A3.5** and their locations are shown on **Plan EDP 5**.

Table EDP A3.5: Preliminary Bat Roost Assessment of Buildings

Building Ref. No.	Photograph	Description and Potential Roost Features	Roosting Suitability 2021	Roosting Suitability 2023
B1		Two-storey cottage comprising of red brick with an external Cotswolds stone frontage. The roof supported clay roof tiles and wooden bargeboards. External features of suitability to support roosting bats includes crevices below the ridge riles, doorway lintel and lead flashing. Internally, the building supports a void lined with bitumen roofing felt. Bat droppings were identified on the loft hatch and wall at the rear. However, since the initial assessment in 2021, external lighting has since been installed on the exterior of **B1** and **B2** which has resulted in significant light spill on these features, reducing the suitability of these features for bats.	Confirmed Roost	Moderate
B2		Single-storey high garage comprising of red brick with an external Cotswolds stone frontage. Roof comprises of clay roof and ridge tiles in a primarily good condition. External features present included minor crevices at the roof eaves and around the Velux windows. However, since the initial assessment in 2021, significant external lighting has since been installed on the exterior of **B1** and **B2** which has resulted in significant light spill on these features, reducing the suitability of these features for bats.	Low	Negligible

Building Ref. No.	Photograph	Description and Potential Roost Features	Roosting Suitability 2021	Roosting Suitability 2023
B3		Open-sided stable block comprising of breeze blocks on the lower half of the building and timber cladding on the upper half. An internal support frame comprising of timber and metal beams support corrugated metal roofing sheets.	Negligible	Negligible
B4		Enclosed horse training centre comprising of breeze blocks on the lower half of the building and vertical timber slats on the upper half. The roof comprises of corrugated metal sheets attached to a metal supporting frame.	Negligible	Negligible

Building Ref. No.	Photograph	Description and Potential Roost Features	Roosting Suitability 2021	Roosting Suitability 2023
B5a and **b**		Timber stable-block of standard construction with a corrugated asbestos roof. Two swallow nests and one other bird nests identified within the stables.	Negligible	Negligible

Building Ref. No.	Photograph	Description and Potential Roost Features	Roosting Suitability 2021	Roosting Suitability 2023
B6		Open-sided metal store comprising of breezeblocks on the lower half of the walls and timber slats on the upper half. The roof comprises of corrugated metal and composite roofing sheets.	Negligible	Negligible
B7		Open-sided metal store comprising of breezeblocks on the lower half of the walls and timber slats on the upper half. The roof comprises of corrugated metal and composite roofing sheets.	Negligible	Negligible

Building Ref. No.	Photograph	Description and Potential Roost Features	Roosting Suitability 2021	Roosting Suitability 2023
S1		Metal glasshouse of standard construction.	Negligible	Negligible

Building Ref. No.	Photograph	Description and Potential Roost Features	Roosting Suitability 2021	Roosting Suitability 2023
S2		Wooden shed of standard construction.	Negligible	Negligible

Dusk Emergence/Dawn Re-entry Surveys

A3.36 In 2021, during the initial July 2021 dusk emergence, a single common pipistrelle bat was seen to emerge from a raised clay tile on the south-eastern aspect of **B1** at 22:12. Similarly, during the subsequent August 2021 survey, a single common pipistrelle was seen emerging from the same location at 21:22. The emergence location is presented on **Plan EDP 5**. This roost was previously considered to be a summer day roost for a single common pipistrelle bat.

A3.37 A series of update bat emergence surveys have been undertaken in July and August 2023. Similar to 2021, relatively low levels of foraging and commuting activity were recorded during the emergence surveys. Activity was typically dominated by common pipistrelle bats with low levels of activity by soprano pipistrelle bats. Furthermore, no bats were seen to emerge or re-enter from building **B1** during the update surveys. however, their absence cannot be ruled out with certainty given the characteristic irregularity of usage by common pipistrelle day roosts. As such, for the purpose of this assessment the common pipistrelle roost is still deemed to be present within **B1** which is of Site-level importance.

Bat Activity Surveys

A3.38 As noted above in relation to the scope/design of the bat activity surveys, the initial habitat assessment of the Site found the Site to be of Low suitability for foraging and commuting bats. This is due to dominance of horse-grazed pasture and hardstanding towards the centre of the Site which is delineated by a network of fence-lines and treelines.

A3.39 The results of the transect surveys are illustrated on **Plans EDP 7**–**9** and results of the automated detector surveys are provided, in detailed and summary form, within **Tables EDP A3.7** to **A3.10**. These results are also described below for the assemblage as whole and on a species-by-species basis. The species accounts also draw upon information collated during the desk study and published data on national conservation status[25].

Overall Diversity, Abundance and Distribution

A3.40 A total of eight bat species/species groups (*Myotis* and long-eared bat species were not identified to species level), were confirmed to be present foraging and/or commuting within the Site during the transect and/or automated detector surveys. With reference to the automated detector data tables, the vast majority of recorded bat calls were of common pipistrelle bats which formed between 73.37% and 78.26% of the calls to date. In relative, calls by soprano pipistrelle, *Myotid* bats, noctule and serotine bats formed a smaller portion of the calls, between 2.45 and 9.23% of the calls. The remaining bat species: Nathusius' pipistrelle, brown long-eared bat and barbastelle make up a very small minority of the overall total.

A3.41 Levels of bat activity recorded during the automated detector surveys were also generally low, with levels of activity gradually increasing during the July and August surveys. Marginally higher levels of activity were also recorded at Location 1, adjacent to hedgerow **H3**, relative to Location 2, adjacent to hedgerow **H2**.

A3.42 Levels of bat activity recorded during the transect surveys were generally low, with similar levels of activity being recorded during the June and July surveys. Similar to the automated detector

[25] https://www.bats.org.uk/our-work/national-bat-monitoring-programme/reports/nbmp-annual-report

surveys, activity is dominated by common pipistrelle with low levels of activity by soprano pipistrelle, noctule and serotine bats also being recorded. The majority of activity observed comprised of individual bats rather than high numbers of bats at any one time and no significant commuting routes have been noted.

A3.43 As can be seen on **Plans EDP 7** to **9**, the majority of activity to date has been recorded along the boundary features and in association with the poor semi-improved grassland in fields **F1** and **F2**, and neutral semi-improved grassland in field **F3**. Low levels of activity was also recorded within the central courtyard by buildings **B3** to **B6**. Field and building numbers are presented on **Plan EDP 1**.

Species/Species Groups Recorded

Pipistrelle Bats (Common, Soprano and Nathusius)

A3.44 Common and soprano pipistrelle bats are common and widespread across the UK, representing the most and second most abundant species in the UK respectively and locally within Oxfordshire[26] as confirmed by the abundance of records for these species within 2km of the Site.

A3.45 Common pipistrelle have been recorded frequently and distributed widely across the Site whilst significantly lower levels of soprano pipistrelle activity have been recorded during both the transects and automated detector surveys. Collectively, common pipistrelles represent 73.66% of all passes at Location 1 and 78.03% of all passes at Location 2. Similarly, activity levels are low during the transect surveys, with the majority of activity being recorded in association with the boundary features, however, very low numbers of individual bats were also observed foraging within the central courtyard by buildings **B3** to **B6**. The common pipistrelle assemblage is considered to be of up to Local value.

A3.46 Soprano pipistrelle use the Site for occasional commuting/foraging at a lower level than common pipistrelle bats, and collectively this species represents 9.63% of all passes at Location 1 and 6.27% of all passes at Location 2. During the transect surveys, individuals are primarily being recorded within the central courtyard by buildings **B3** to **B6** and along the western boundary. The soprano pipistrelle assemblage is considered to be of up to Site value.

A3.47 Nathusius' pipistrelle are relatively rare across the UK and in Oxfordshire, with a range which is primarily restricted towards the southern UK with small pockets of populations in Scotland and Northern Ireland. During the surveys, Nathusius' pipistrelle have only been recorded during the automated detector surveys at Location 1 during the July, August and September surveys with the activity comprising of a single pass during each survey. The Nathusius' pipistrelle assemblage is considered to be of up to Local value given the rarity of this species within Oxfordshire.

[26] Oxfordshire Bat Group, (2023)., http://www.oxfordshirebats.org/oxfordshire-bats.php

Myotid Bats

A3.48 *Myotis* bat species occur throughout most of the UK, their populations considered to be either stable or increasing with the exception of Bechstein's bat (*Myotis bechsteinii*), which is listed in Annex II of the EC Habitats Directive, and considerably rarer.

A3.49 *Myotis* sp. bats use the Site for commuting/foraging at a moderate level; collectively this species group represents 6.99% of all passes at Location 1 and 4.72% of all passes at Location 2. This species group has not been recorded during the transect surveys. Given the low levels of activity which has only been recorded during the automated detector survey to date, it is considered likely that individuals use the Site for occasional commuting/foraging only. The identified *Myotis* sp. assemblage is considered to be of up to Local value.

Long-eared Bat

A3.50 Brown long-eared bats are considered to be widespread and common across the UK with national populations considered stable. In contrast, populations of grey long-eared bats (*Plecotus austriacus*) bat are largely limited to the south coast of England although this species is typically under recorded.

A3.51 Long-eared bats appear use the Site for commuting/foraging at a low level only and collectively this species represents <1% of all passes. Furthermore, no activity by long-eared bats has been recorded during the manual transect surveys. The Site is located outside of the known range for grey long-eared bats as such it is considered highly unlikely that these calls were from grey long-eared bats. Given that brown long-eared bats are locally common and the low levels of activity recorded, the Site is not considered to be of value to this species for foraging and commuting purposes. As such, the long-eared assemblage is considered to be of Site-value only.

Noctule, Leisler and Serotine Bats

A3.52 Noctule bat is widespread across the UK with the exception of northern Scotland, with its population and range considered to be stable across the UK whilst serotine bats are restricted to southern England and Wales where they are widespread but scare. Leisler's bat is uncommon but widespread across the UK and has not been recorded during the surveys to date.

A3.53 Only very low levels of noctule activity have been recorded to date during the transect surveys, with marginally higher levels of activity being recorded on the automated detector surveys. Similar levels of activity have been recorded at Locations 1 and 2, with noctules forming 3.18% and 4.09% of the total passes respectively. Given the low levels of activity recorded, it is not considered likely that this species regularly uses the Site for foraging and/or commuting purposes and likely utilises the Site to commute towards more favoured foraging habitats off-Site. Noctule is a rarer bat and there are likely be to tree in the wider locality that could provide roosting opportunities for this species. The noctule assemblage identified is considered to be up to Local value.

A3.54 Similarly, only low levels of serotine bat activity have been recorded during the transect and automated detector surveys to date. The levels of activity have been notably higher at Location 1 relative to Location 2 with serotine bat passes forming 5.45% of the total at Location 1 relative to 1.18% of the passes at Location 2. Given the low levels of activity recorded, is it not

considered likely that this species regularly uses the Site for foraging and commuting purposes. Serotine is a rarer bat and there are likely be to buildings in the wider locality that could provide roosting opportunities for this species. The serotine bat assemblage identified is considered to be up to Local value.

Barbastelle

A3.55 Barbastelle bat is listed in Annex II of the EC Habitats Directive and is considered widespread across England and Wales, but rare at a national and county level. Only very low levels of barbastelle activity has been recorded on the automated detector surveys and a single barbastelle was recorded during the October transect survey. Collectively, this species forms <1% of total passes on Site at both locations. Barbastelle are extremely rare and are typically recorded in association with woodland and river corridors. Given the very low levels of activity recorded, this species is considered likely to use the Site for foraging and commuting intermittently only and is considered highly unlikely to be roosting within or immediately adjacent to the Site given the very low levels of activity recorded. The barbastelle assemblage identified is considered to be of up to County level importance.

Evaluation of Overall Bat Assemblage

A3.56 There are no known bat roosts on or immediately adjacent to the Site and the Site offers suitable foraging and commuting habitat to a range of bat species. The abundance and diversity of bat species recorded on Site is considered to be typical of a rural-urban edge farmland Site in Oxfordshire. However, a number of rarer species have also been recorded including barbastelle and Nathusius' pipistrelle, populations of which are of up to county level value. Given the low density and frequency of activity recorded, it is considered likely that the rarer bat species are utilising the Site to commute towards optimal habitats off-Site including areas of broadleaved woodland to the north and east of the Site. Based on the overall extent of foraging and commuting activity, the overall bat assemblage using the Site is judged to be of Local importance.

Automated Detector Data Tables

Table EDP A3.6: Automated Detector Survey Results June 2023

Location	Bat Species	Number of Bat Passes Recorded per Night					Total (and Percentage)
		09.06.23	10.06.23	11.06.23	12.06.23	13.06.23	
1	Common Pipistrelle	17	48	11	19	30	125 (77.16%)
	Noctule	0	7	2	4	2	15 (9.26%)
	Soprano pipistrelle	1	4	3	0	2	10 (5.56%)
	Myotis	0	6	0	2	1	9 (5.56%)
	Serotine	0	1	1	1	0	3 (1.85%)
	Total	**18**	**66**	**17**	**26**	**35**	**162**

Location	Bat Species	Number of Bat Passes Recorded per Night					Total (and Percentage)
		09.06.23	10.06.23	11.06.23	12.06.23	13.06.23	
2	Common Pipistrelle	10	22	4	5	3	44 (64.71%)
	Myotis	3	1	6	3	3	16 (23.53%)
	Noctule	1	2	2	1	0	6 (8.82%)
	Soprano pipistrelle	0	0	1	0	0	1 (1.47%)
	Long-eared bat	0	0	1	0	0	1 (1.47%)
	Total	**14**	**25**	**14**	**9**	**6**	**68**

Table EDP A3.7: Automated Detector Survey Results July 2023

Location	Bat Species	Number of Bat Passes Recorded per Night					Total (and Percentage)
		19.07.23	20.07.23	21.07.23	22.07.23	23.07.23	
1	Common Pipistrelle	26	32	45	21	33	157 (70.09%)
	Serotine	6	10	3	1	3	23 (10.27%)
	Soprano pipistrelle	1	3	4	2	6	16 (7.14%)
	Myotis	2	2	1	6	4	15 (6.70%)
	Noctule			3	3	2	8 (3.57%)
	Barbastelle	0	0	0	0	2	2 (0.89%)
	Nathusius' pipistrelle	0	0	0	1	0	1 (0.45%)
	Long-eared bat	1	0	0	0	0	1 (0.45%)
	Total	**36**	**48**	**56**	**34**	**50**	**224**
2	Common Pipistrelle	23	53	28	11	16	131 (90.34%)
	Myotis	0	4	1	1	0	6 (4.14%)
	Serotine	2	3	0	1	0	6 (4.14%)
	Noctule	0	0	0	0	1	1 (0.69%)
	Long-eared bat	0	0	0	0	1	1 (0.69%)
	Total	25	60	29	13	18	145

Table EDP A3.8: Automated Detector Survey Results August 2023

Location	Bat Species	Number of Bat Passes Recorded per Night					Total (and Percentage)
		24.08.23	25.08.23	26.08.23	27.08.23	28.08.23	
1	Common Pipistrelle	37	87	38	58	52	272 (69.74%)
	Soprano pipistrelle	6	10	10	10	11	47 (12.05%)
	Myotis	2	4	6	8	8	28 (7.18%)
	Serotine	5	4	6	6	1	22 (5.64%)
	Noctule	3	6	3	3	2	17 (4.36%)
	Barbastelle	1	0	0	0	1	2 (0.51%)
	Nathusius' pipistrelle	0	0	1	0	0	1 (0.26%)
	Long-eared bat	0	0	1	0	0	1 (0.26%)
	Total	**54**	**111**	**65**	**85**	**75**	**390**
2	Common Pipistrelle	29	40	28	65	51	213 (78.60%)
	Soprano pipistrelle	0	4	4	4	2	14 (5.17%)
	Noctule	2	5	3	3	4	17 (6.27%)
	Myotis	4	0	3	4	1	12 (4.43%)
	Serotine	0	1	1	2	2	6 (2.21%)
	Pipistrelle Social	0	0	0	5	0	5 (1.85%)
	Long-eared bat	0	1	0	0	2	3 (1.11%)
	Barbastelle	0	0	0	1	0	1 (0.37%)
	Total	**35**	**51**	**39**	**84**	**62**	**271**

Table EDP A3.9: Automated Detector Survey Results September 2023

Location	Bat Species	Number of Bat Passes Recorded per Night					Total (and Percentage)
		21.09.23	22.08.23	23.08.23	24.08.23	25.08.23	
1	Common Pipistrelle	11	24	66	99	57	257 (78.35%)
	Soprano pipistrelle	4	8	3	12	6	33 (10.06%)
	Myotis	7	4	13	6	4	34 (10.37%)

Location	Bat Species	Number of Bat Passes Recorded per Night					Total (and Percentage)
		21.09.23	22.08.23	23.08.23	24.08.23	25.08.23	
	Nathusius' pipistrelle	0	0	0	1	0	1 (0.30%)
	Noctule	0	0	0	0	1	1 (0.30%)
	Total	**23**	**36**	**82**	**118**	**69**	**328**
2	Common Pipistrelle	64	70	39	103	71	347 (75.76%)
	Soprano pipistrelle	19	12	11	2	10	54 (11.79%)
	Noctule	1	3	4	8	5	21 (4.59%)
	Myotis	0	11	1	4	2	18 (3.93%)
	Long-eared bat	1	3	1	2	2	9 (1.97%)
	Barbastelle	0	0	1	4	3	8 (1.75%)
	Serotine	0	0	1	0	0	1 (0.22%)
	Total	**85**	**99**	**58**	**123**	**93**	**458**

Table EDP A3.10: Monthly Summary of Automated Detector Surveys

Survey Month	Species	Number of Passes	% of Month Total
June 2023	Common Pipistrelle	169	73.48
	Soprano pipistrelle	11	4.78
	Nathusius' pipistrelle	0	0
	Long-eared bat	1	0.43
	Myotis	16	6.96
	Noctule	15	6.52
	Serotine	15	6.52
	Barbastelle	3	1.30
	Total	230	
July 2023	Common Pipistrelle	288	78.26
	Soprano pipistrelle	16	4.35
	Nathusius' pipistrelle	1	0.27
	Long-eared bat	2	0.54
	Myotis	21	5.71
	Noctule	9	2.45
	Serotine	29	7.88
	Barbastelle	2	0.54
	Total	368	

Survey Month	Species	Number of Passes	% of Month Total
August 2023	Common Pipistrelle	485	73.37
	Soprano pipistrelle	61	9.23
	Nathusius' pipistrelle	1	0.15
	Pipistrelle Social	5	0.76
	Long-eared bat	4	0.61
	Myotis	40	6.05
	Noctule	34	5.14
	Serotine	28	4.24
	Barbastelle	3	0.45
	Total	661	
September 2023	Common Pipistrelle	604	77.04
	Soprano pipistrelle	87	11.10
	Myotis	52	6.63
	Noctule	22	2.81
	Long-eared bat	9	1.15
	Barbastelle	8	1.02
	Nathusius' pipistrelle	1	0.13
	Serotine	1	0.13
	Total	784	

Appendix EDP 4
Great Crested Newt Survey

METHODOLOGY

HSI Assessment of Waterbodies

A4.1 A HSI assessment is a standardised method[27] which uses a range of criteria, such as water quality, fish/waterfowl presence and surrounding terrestrial habitat quality, to derive a suitability score or 'index'. Waterbodies with high scores are more likely to support great crested newt compared to those with lower scores. HSI scores and the associated suitability categories for great crested newts are set out within **Table EDP A4.1**.

Table EDP A4.1: HSI Scores and Waterbody Suitability Categories

HSI Score	Suitability of Waterbody 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

A4.2 A HSI assessment was undertaken of all waterbodies on Site, and those within 250m of the Site (but not separated from the Site by significant dispersal barriers) to which access was granted. With reference to **Plan EDP 10**, the waterbodies assessed are **P1** and **P2**. The assessment was undertaken by a suitably experienced ecologist on 22 June 2021 and updated on 10 July 2023.

Environmental DNA Sampling of Waterbodies

A4.3 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 eDNA may persist for several weeks, and can be collected through a water sample, and analysed to determine if the target species of interest is/has been present in the water body. eDNA sampling of waterbodies between 15 April and 30 June (inclusive) gives a highly reliable indication of the presence or likely absence of great crested newt.

A4.4 eDNA sampling was undertaken of all waterbodies on Site, and those within 250m of the Site (but not separated from the Site by significant dispersal barriers) to which access was granted. An attempt was made to sample waterbodies **P1** and **P2**, however the water depth in **P1** was insufficient to collect water samples. The sampling was undertaken by a suitably experienced ecologist on 22 June 2021, using sampling kits obtained from SureScreen Scientifics and

[27] 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

following a standard protocol set out by the Freshwater Habitats Trust[28] which is approved by Natural England. Briefly, this protocol involves (per pond):

- Collecting 20 water samples from selected areas evenly spread around the accessible perimeter of the waterbody, including both open water and vegetated areas;
- Collecting a ladle of water at each sampling location, stirring the water column without stirring up sediment during collection;
- Shaking and inverting the combined samples thoroughly once all 20 ladles are collected; and
- Extracting 15ml of this mixed sample into six conical tubes, each containing preservative fluid, a shaking thoroughly to homogenize the sample.

A4.5 The water samples were then sent to SureScreen Scientifics be analysed for great crested newt eDNA, using real-time Polymerase Chain Reaction (PCR). The report was returned on the 05 July 2021.

Limitations

A4.6 Surveys were undertaken for all accessible ponds within the same land ownership only, due to matters of confidentiality. As noted above, the water depth in pond **P1** was insufficient to collect water samples for an eDNA survey, however this is itself indicative of poor suitability.

RESULTS

A4.7 Two records of great crested newt were returned within 2km of the Site, the nearest record being circa 1.3km south-west of the Site. Furthermore, FPCR undertook population assessments in 2013 for off-Site pond **P7** c. 250m north-west of the Site, which supported a confirmed population of great crested newts. No nearby records relating to EPSMLs issued for great crested newt were returned from the data search on MAGIC.

A4.8 The results of the surveys of all accessible waterbodies within the Site are set out in **Table EDP A4.2**. These should be read in conjunction with **Plan EDP 10**. In summary, no evidence of great crested newts was recorded within ponds **P1** and **P2** 2021, as such, they are presumed absent from these waterbodies. A copy of the 2021 eDNA analysis report[29] for pond **P2** is provided separately as **Appendix EDP 5**.

A4.9 Due to the limited suitability of on Site waterbodies, which have consistently been of 'poor' suitability for great crested newts, an update eDNA survey was not undertaken for ponds **P1** and **P2** in 2023. Furthermore, due to the separation of the Site and on Site waterbodies from the closest suitable waterbody (**P7**) by over 250m, and the nature of the habitat surrounding pond **P7**, which is dominated by optimal woodland habitat, it is considered highly unlikely that

[28] 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.

[29] The pond reference within the eDNA report (P10) is based on a previous numbering system. This relates to pond P2.

newts would disperse onto Site which primarily supports habitats sub-optimal for newts in their terrestrial and aquatic phase.

Table EDP A4.2: Great Crested Newt Survey Results (On Site Waterbodies)

Waterbody	Photograph	Description	HSI	eDNA
P1		A small, shallow depression which primarily supports little to no water except during periods of high rainfall. The pond is surrounded by horse-grazed pasture.	Poor (0.49)	Too dry to survey
P2		A medium sized garden pond, which supports a modest number of fish including carp species. The pond supports a number of aquatic species including water lily, purple loosestrife and horsetail species. A small outflow into the pond is present along the southern margin.	Poor (0.45)	Negative

Appendix EDP 5
Great Crested Newt eDNA Analysis Report

SureScreen Scientifics

Folio No: E11175
Report No: 1
Purchase Order: EDP 7205
Client: EDP LTD
Contact: EDP

TECHNICAL REPORT

ANALYSIS OF ENVIRONMENTAL DNA IN POND WATER FOR THE DETECTION OF GREAT CRESTED NEWTS (TRITURUS CRISTATUS)

SUMMARY

When great crested newts (GCN), *Triturus cristatus*, inhabit a pond, they continuously release small amounts of their DNA into the environment. By collecting and analysing water samples, we can detect these small traces of environmental DNA (eDNA) to confirm GCN habitation or establish GCN absence.

RESULTS

Date sample received at Laboratory: 24/06/2021
Date Reported: 05/07/2021
Matters Affecting Results: None

Lab Sample No.	Site Name	O/S Reference	SIC	DC	IC	Result	Positive Replicates
2684	POND 10	-	Pass	Pass	Pass	Negative	0

If you have any questions regarding results, please contact us: ForensicEcology@surescreen.com

Reported by: Chris Troth **Approved by:** Chris Troth

METHODOLOGY

The samples detailed above have been analysed for the presence of GCN eDNA following the protocol stated in DEFRA WC1067 'Analytical and methodological development for improved surveillance of the Great Crested Newt, Appendix 5.' (Biggs et al. 2014). Each of the 6 sub-sample tubes are first centrifuged and pooled together into a single sample which then undergoes DNA extraction. The extracted sample is then analysed using real time PCR (qPCR), which uses species-specific molecular markers to amplify GCN DNA within a sample. These markers are unique to GCN DNA, meaning that there should be no detection of closely related species.

If GCN DNA is present, the DNA is amplified up to a detectable level, resulting in positive species detection. If GCN DNA is not present then amplification does not occur, and a negative result is recorded.

Analysis of eDNA requires scrupulous attention to detail to prevent risk of contamination. True positive controls, negative controls and spiked synthetic DNA are included in every analysis and these have to be correct before any result is declared and reported. Stages of the DNA analysis are also conducted in different buildings at our premises for added security.

SureScreen Scientifics Ltd is ISO9001 accredited and participate in Natural England's proficiency testing scheme for GCN eDNA testing. We also carry out regular inter-laboratory checks on accuracy of results as part of our quality control procedures.

INTERPRETATION OF RESULTS

SIC: **Sample Integrity Check** [Pass/Fail]
When samples are received in the laboratory, they are inspected for any tube leakage, suitability of sample (not too much mud or weed etc.) and absence of any factors that could potentially lead to inconclusive results.

DC: **Degradation Check** [Pass/Fail]
Analysis of the spiked DNA marker to see if there has been degradation of the kit or sample between the date it was made to the date of analysis. Degradation of the spiked DNA marker may lead indicate a risk of false negative results.

IC: **Inhibition Check** [Pass/Fail]
The presence of inhibitors within a sample are assessed using a DNA marker. If inhibition is detected, samples are purified and re-analysed. Inhibitors cannot always be removed, if the inhibition check fails, the sample should be re-collected.

Result: **Presence of GCN eDNA** [Positive/Negative/Inconclusive]
Positive: GCN DNA was identified within the sample, indicative of GCN presence within the sampling location at the time the sample was taken or within the recent past at the sampling location.
Positive Replicates: Number of positive qPCR replicates out of a series of 12. If one or more of these are found to be positive the pond is declared positive for GCN presence. It may be assumed that small fractions of positive analyses suggest low level presence, but this cannot currently be used for population studies. In accordance with Natural England protocol, even a score of 1/12 is declared positive. 0/12 indicates negative GCN presence.
Negative: GCN eDNA was not detected or is below the threshold detection level and the test result should be considered as evidence of GCN absence, however, does not exclude the potential for GCN presence below the limit of detection.

Appendix EDP 6
Biodiversity Net Gain Assessment

A6.1 A Biodiversity Net Gain (BNG) assessment has been undertaken to objectively measure the net biodiversity impacts of the proposed development and to assess the scheme's ability to deliver net biodiversity gain. The assessment has been undertaken using the Department for the Environment Farming and Rural Affairs (DEFRA) Biodiversity Metric 4.0 (released in March 2023), which was the latest Metric when the assessment work commenced. The assessment has been undertaken by an ecological consultant suitably experienced in these types of assessment, and with reference to current best practice guidance.

A6.2 The Biodiversity Metric uses habitat as a proxy for wider biodiversity with different habitat types scored according to their relative biodiversity potential. There are three different types of biodiversity unit which can be measured in the Metric, namely Habitat Units; Hedgerow Units and Watercourse Units. Habitat Units relate to two-dimensional areas measured in hectares (and are referred to as Area Units in the Metric User Guide[30]), whereas Hedgerow and Watercourse Units relate to one-dimensional lengths measured in kilometres.

A6.3 Factors such as distinctiveness, size, condition, and location, affect the unit score, and in the case of newly created/enhanced habitats the risk (time and difficulty) to reach target habitat condition affects the resulting score. The total number of 'biodiversity units' pre- and post-development are calculated in the Metric and used to calculate the total net change.

A6.4 The Metric is a simple assessment tool and only considers direct impacts on biodiversity through impacts on habitats. Indirect impacts are not included, and the Metric does not take account of any other protected species enhancement measures such as the provision of habitat features such as bird and bat boxes, basking sites (e.g. log piles) and hibernaculum. The Metric is intended to be used alongside professional judgement as part of the decision-making process. The User Guide states that:

"The metric and its outputs should be used alongside ecological expertise as part of the evidence that informs plans and decisions."

METHODOLOGY

A6.5 The following sections break down the various components of the BNG Assessment to provide further clarity on how individual elements have been entered into the Metric. The following should be read in conjunction with the Biodiversity Metric 4.0 (report ref: edp7205_r002), a copy of which has been submitted to the LPA alongside the planning application and is available on request.

On Site Baseline

A6.6 The pre-development (baseline) biodiversity value of the Site was calculated using the information derived from the habitat survey completed in July 2023 as described within

[30] Natural England Joint Publication JP039. The Biodiversity Metric 4.0 User Guide. March 2023

Appendix EDP 1. The main habitats present within the Site were classified in accordance with the UK Habitat Classification System and their current condition was assessed with reference to the habitat-specific criteria detailed within the Biodiversity Metric 4.0 Technical Annexes.

A6.7 In this case Watercourse Units were not measured as there are no qualifying water courses present. GIS software was used to accurately measure the area/length of existing habitats. The measured habitat areas/lengths were entered into the Metric as illustrated on **Plan EDP 12**.

On Site Post-Intervention

A6.8 The predicted post-development biodiversity value of the Site has been calculated based on the Illustrative Masterplan and associated illustrative landscape proposals.

A6.9 Given the proposals are currently at the outline planning stage, and the development layout and landscape design are therefore illustrative, reasonable assumptions have been made using professional judgement on the type, extent and condition of habitats to be retained, enhanced, and newly created. The predicted post-development habitats were entered into the Biodiversity Metric as illustrated on **Plan EDP 13**. Further details regarding the predicted habitats are set out below.

Retained and Enhanced Habitats

A6.10 Retained and enhanced habitats have been entered into the metric as follows:

- 0.1014ha of modified grassland (low distinctiveness) and 0.0825ha of other neutral grassland (medium distinctiveness) retained below hedgerows;
- 0.0979ha of modified grassland (low distinctiveness) enhanced to lowland meadow (very high distinctiveness);
- 0.213ha of modified grassland (low distinctiveness) enhanced to other neutral grassland (medium distinctiveness);
- 0.6414ha of other neutral grassland (medium distinctiveness), enhanced to lowland meadow (very high distinctiveness);
- 0.89896ha of moderate condition other neutral grassland (medium distinctiveness), enhanced to good condition other neutral grassland (medium distinctiveness);
- 0.0242ha of bramble scrub (medium distinctiveness) enhanced to mixed scrub (medium distinctiveness);
- 0.0736ha of moderate condition mixed scrub (medium distinctiveness) enhanced to good condition mixed scrub (medium distinctiveness); and
- 0.329km (94%) of the total hedgerow network (0.351km) to be retained and enhanced. 0.274km to be enhanced from native hedgerow with trees (medium distinctiveness) to species-rich native hedgerow with trees (high distinctiveness), and 0.082km of native hedgerow (low distinctiveness) to be enhanced to species-rich native hedgerow (medium distinctiveness).

Habitat Creation

A6.11 Newly created habitats have been entered into the metric as follows:

- Developed land; sealed surface, to comprise the proposed extent of the residential dwellings, parking, roads and footpaths, and vegetated gardens;
- Natural play/trail spaces, assumed to comprise a third 'artificial unvegetated, unseal surface' such as woodchip, and two-thirds modified grassland of poor condition, likely sown with a hard wearing seed mixture suitable for high levels of amenity use;
- Modified grassland of 'moderate' condition to be applied across the Site, predominantly in areas associated with more formal uses, e.g. road verges and areas of public open space (POS) surrounding the play area. Assumes a diverse flowering lawn, tolerant of regular mowing, is created (e.g. using Emorsgate EL1 'flowering lawn mixture'), which will achieve 'moderate' condition. These areas will be managed without the application of fertilisers, herbicides or pesticides;
- Creation of an area of neutral wildflower rich grassland (denoted as 'other neutral grassland') of moderate condition to be created across the Site, including areas surrounding attenuation basins, along retained hedgerow/green corridors and within the north-west of the Site;
- An area of lowland meadow of good condition, to be sown with wildflower grassland and fenced off to prevent public access, in the north-west of the Site;
- Creation of a traditional orchard of moderate condition, to be sown with a wildflower seed mixture and managed as a community orchard;
- Mixed native scrub planting to achieve good condition, used to provide screening and provide forage and shelter for wildlife;
- Sustainable urban drainage features and swales designed to maximise biodiversity benefits, and achieve 'good' condition, through sensitive design and planting with diverse mix of native aquatic and semi-aquatic flora;
- A wildlife pond of good condition, independent of the drainage solution, to be planted with aquatic species and managed to maximise value to wildlife; and
- Urban trees to be planted throughout the development footprint and rural trees to be planted within informal POS areas. Details regarding the number, locations and/or specification of street trees is unknown at the outline planning stage. For the purpose of the Biodiversity Metric calculations, estimations have been made to include 64 small urban trees of poor condition and 65 small trees of moderate condition.

NET BIODIVERSITY IMPACT

A6.12 The predicted overall net change in biodiversity units, taking into account all proposed habitat retention, enhancement and creation, is summarised in **Table EDP 6.1**.

Table EDP A6.1: Biodiversity Metric 4.0 Headline Results

	Habitat Units	**Hedgerow Units**
On Site Baseline	33.68	4.46
On Site Post-intervention	37.26	7.36
On Site Net Unit Change	+ 3.58	+2.90
On Site Net % Change	+10.64% gain	+65.06% net

A6.13 The Metric has demonstrated that the proposed development, albeit in outline, is capable of delivering net gains in biodiversity on Site at a scale which meets local planning policy requirements and is in line with future legislative requirements under the Environment Act 2021.

A6.14 To ensure this is achieved through the Reserved Matters stage of the proposed development, the detailed design of the development should be carried out in accordance with the assumptions made in this report regarding habitat retention, enhancement and creation. Deviance from the assumptions made could result in a reduction in post-development biodiversity value below the target level, which would require alternative habitat provisions to address the shortfall in units and ensure the proposed development delivers the target level of biodiversity net gain.

Plans

Plan EDP 1: Phase 1 Habitat Plan
(edp7205_d004a 19 December 2023 GYo/JGw)

Plan EDP 2: National Statutory Designations
(edp7205_d002b 19 December 2023 PDr/JGw)

Plan EDP 3: Non-Statutory Designations
(edp7205_d003a 19 December 2023 GYo/JGw)

Plan EDP 4: Breeding Bird Survey – 21 June 2023
(edp7205_d010a 19 December 2023 GYo/JGw)

Plan EDP 5: Bat Roost Surveys
(edp7205_d006a 19 December 2023 GYo/JGw)

Plan EDP 6: Transect Routes and Automated Bat Detector Locations
(edp7205_d007a 19 December 2023 GYo/JGw)

Plan EDP 7: Dusk Transect Bat Activity Survey - 20 June 2023
(edp7205_d008a 19 December 2023 GYo/JGw)

Plan EDP 8: Dusk Transect Bat Activity Survey – 24 July 2023
(edp7205_d009a 19 December 2023 GYo/JGw)

Plan EDP 9: Dusk Transect Bat Activity Survey – 17 October 2023
(edp7205_d013 14 December 2023 MMc/TWi)

Plan EDP 10: Ponds within 500m of the Site
(edp7205_d005a 19 December 2023 GYo/JGw)

Plan EDP 11: Reptile Survey Results
(edp7205_d011a 19 December 2023 GYo/JGw)

Plan EDP 12: Biodiversity Net Gain Assessment: Baseline Habitats
(edp7205_d012a 19 December 2023 DJo/EDe)

Plan EDP 13: Biodiversity Net Gain Assessment: Proposed Habitats
(edp7205_d014 20 December 2023 JFr/EDe)

- Site Boundary
- Semi-natural Mixed Woodland
- Dense Continuous Scrub
- Scattered Scrub
- Tall Ruderal
- Scrub and Tall Ruderal
- Amenity Planting
- SI — Semi-improved Neutral Grassland
- SI — Poor Semi-improved Grassland
- Standing Water
- Building
- Hardstanding
- Bare Ground
- Building Containing Minor Bat Roost
- Intact Species-poor Hedgerow and Trees
- Intact Species-poor Hedgerow
- Scattered Trees/Parkland (Coniferous)
- Earth Bank
- Fence
- Scattered Trees (Broadleaved)
- Scattered Trees (Coniferous)
- Scattered Scrub
- TN1 — Target Note
- H1 — Hedgerow Number
- W1 — Woodland Number
- P1 — Pond Number
- F1 — Field Number
- B1/S1 — Building Number

client

Richborough

project title

Land West of Fringford Road, Caversfield

drawing title

Phase 1 Habitat Plan

date	**19 DECEMBER 2023**	drawn by	**GYo**
drawing number	**edp7205_d004a**	checked	**JGw**
scale	**1:1,500 @ A3**	QA	**JFr**

the environmental dimension partnership

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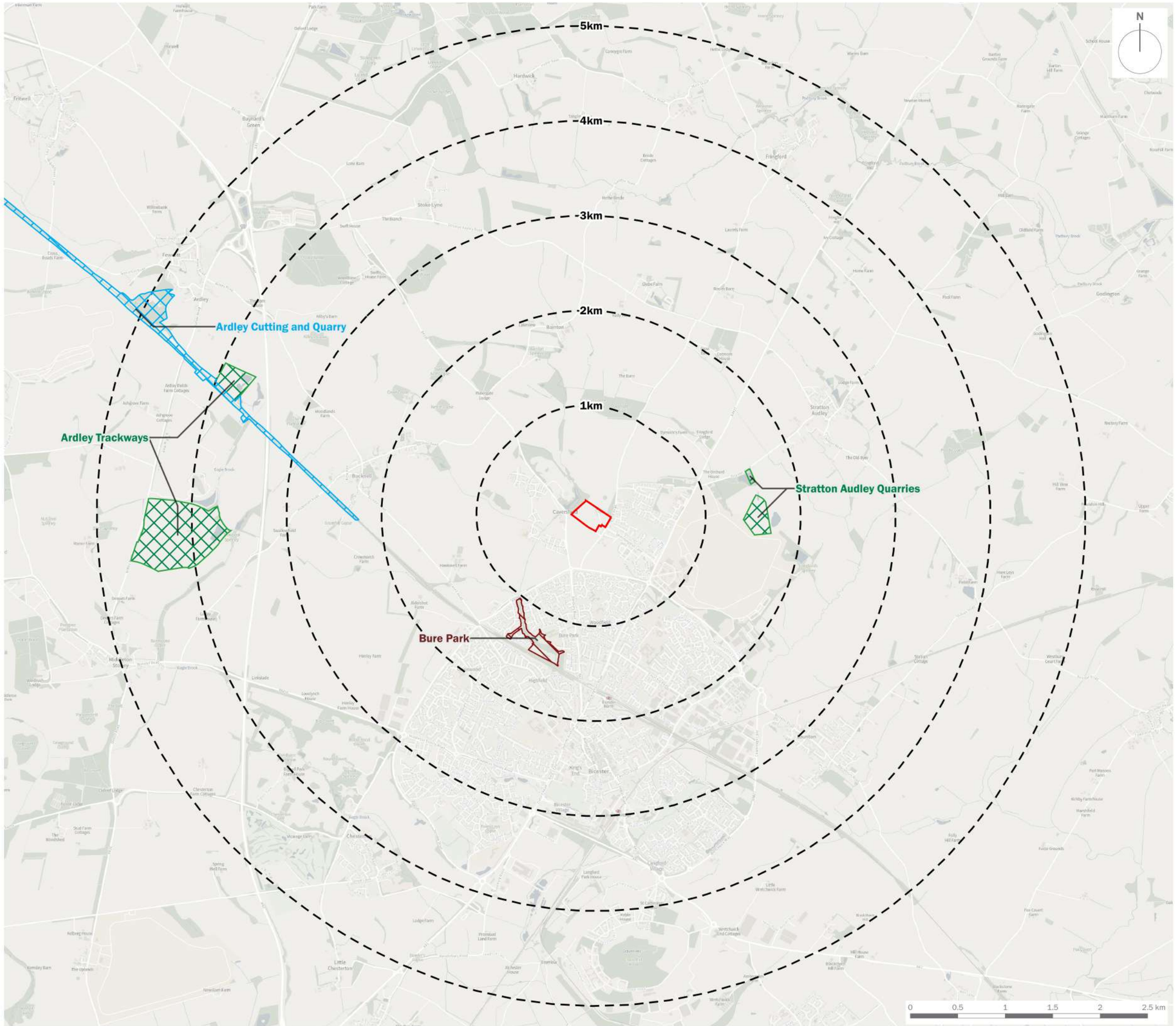

Site Boundary

Range Rings (at 1km intervals)

Local Nature Reserve

Site of Special Scientific Interest (Designated for Geological Interest)

Site of Special Scientific Interest (Designated for Ecological and Geological Interest)

client

Richborough

project title

Land West of Fringford Road, Caversfield

drawing title

National Statutory Designations

date	**19 DECEMBER 2023**	drawn by	**PDr**
drawing number	**edp7205_d002b**	checked	**JGw**
scale	**1:39,000 @ A3**	QA	**JFr**

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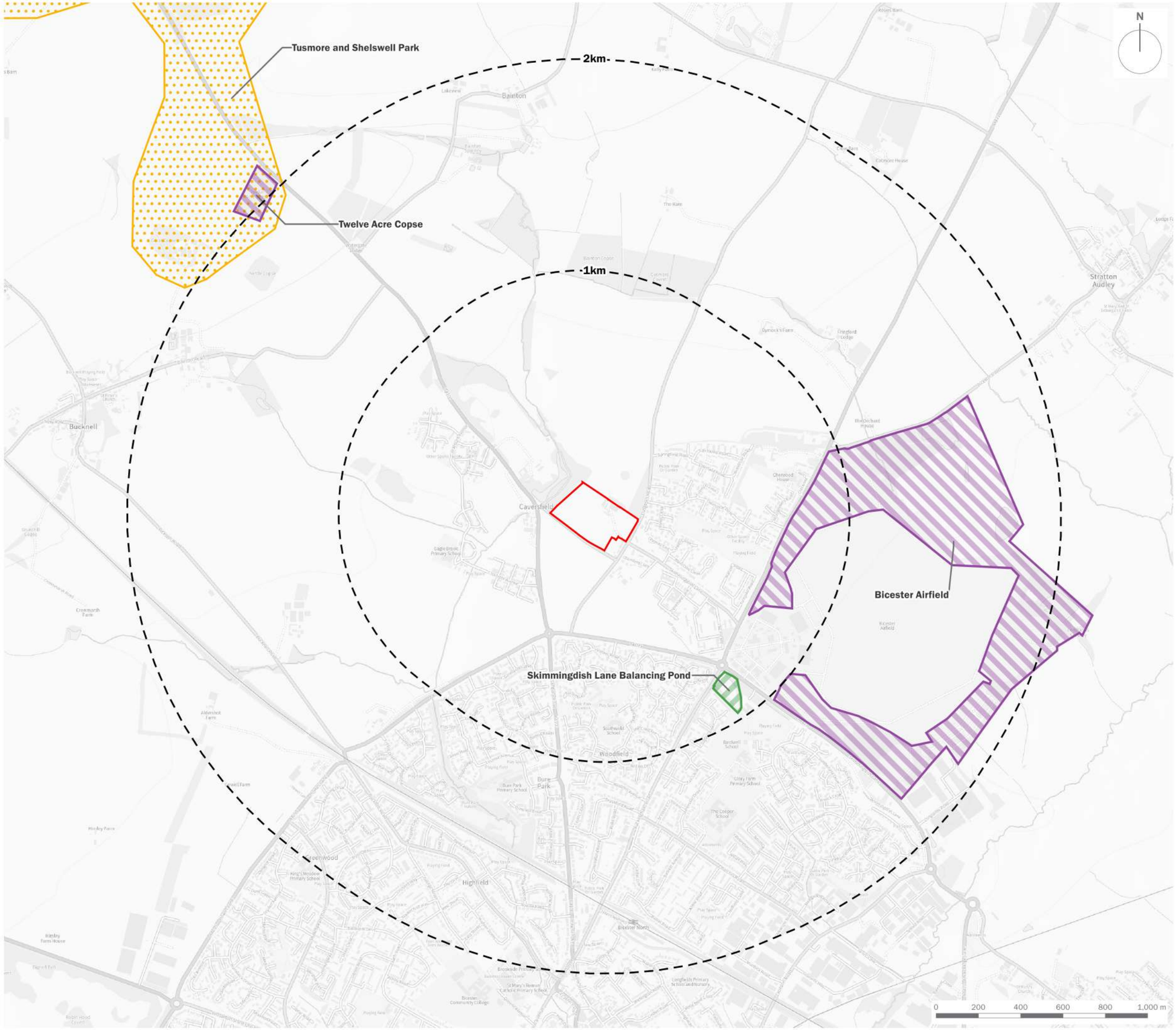

Site Boundary

Range Rings (at 1km intervals)

Cherwell District Wildlife Site

Oxfordshire Local Wildlife Site

Conservation Target Area

client

Richborough

project title

Land West of Fringford Road, Caversfield

drawing title

Non-Statutory Designations

date	**19 DECEMBER 2023**	drawn by	**GYo**
drawing number	**edp7205_d003a**	checked	**JGw**
scale	**1:17,500 @ A3**	QA	**JFr**

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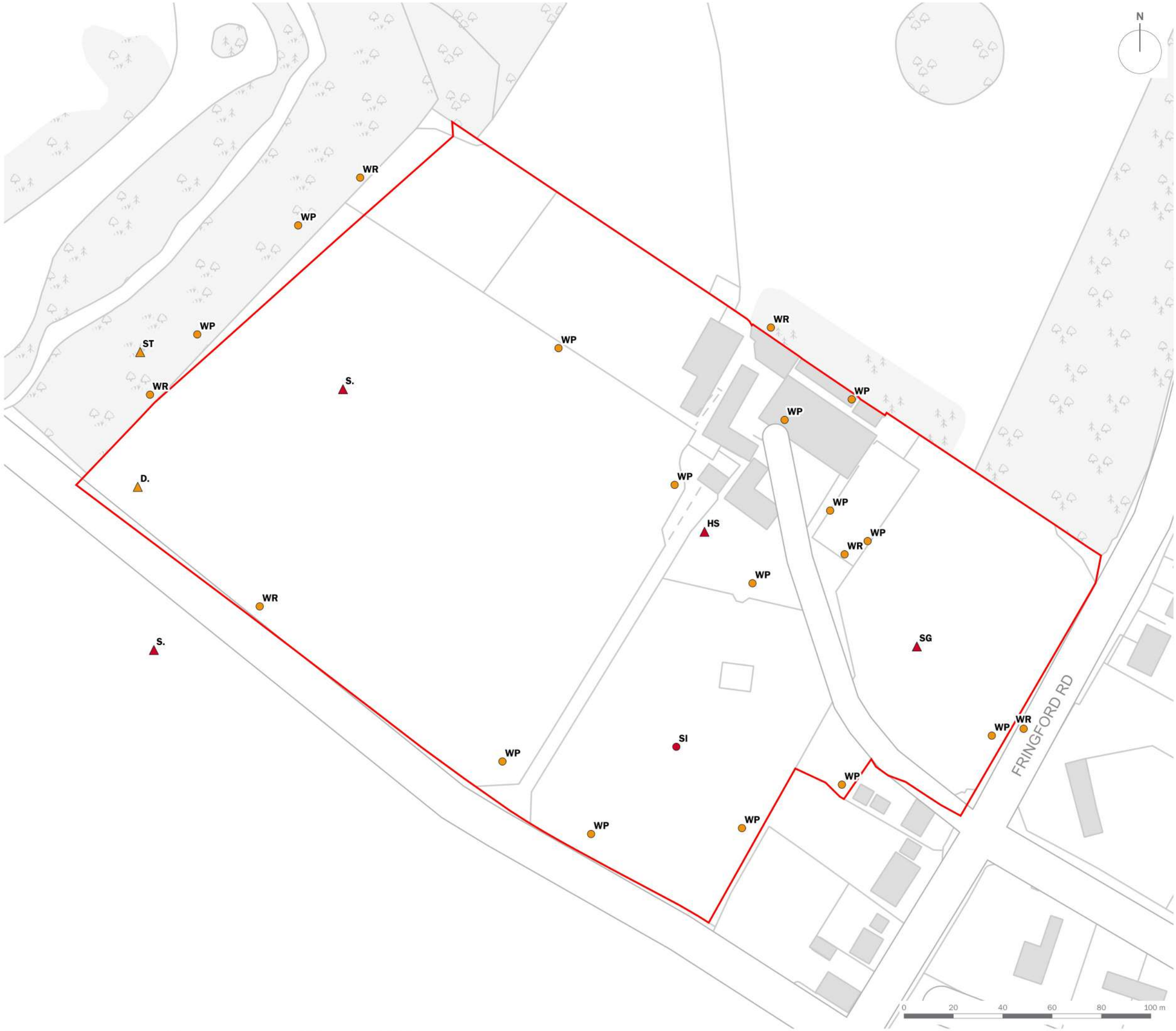

Site Boundary

Conservation Status

Species of Principal Importance

Not Listed as Schedule 1 or SPI

Birds of Conservation Concern

Red List

Amber List

Code	Species
D.	Dunnock
HS	House Sparrow
S.	Skylark
SG	Common Starling
SI	Common Swift
ST	Song Thrush
WP	Woodpigeon
WR	Wren

Points shown are an indicative point within a bird's territory and not necessarily the exact breeding location.

client

Richborough

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Land West of Fringford Road, Caversfield

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Breeding Bird Survey – 21 June 2021

date	**19 DECEMBER 2023**	drawn by	**GYo**
drawing number	**edp7205_d010a**	checked	**JGw**
scale	**1:1,500 @ A3**	QA	**JFr**

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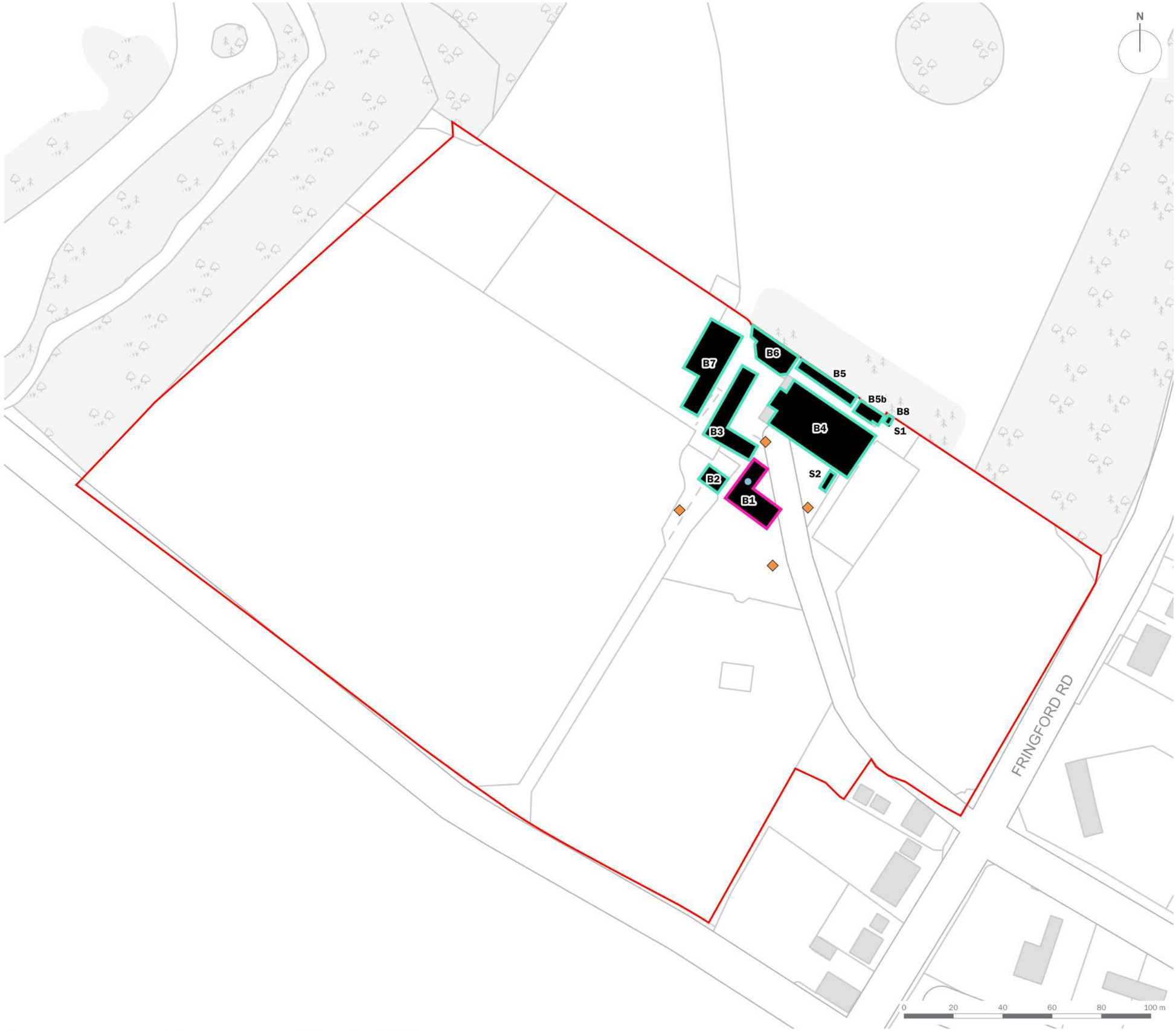

Site Boundary

Confirmed Roost 2021

Negligible Bat Roost Potential

Common Pipistrelle Emergence 2021

Surveyor Location

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Land West of Fringford Road, Caversfield

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Bat Roost Surveys

date	**19 DECEMBER 2023**	drawn by	**GYo**
drawing number	**edp7205_d006a**	checked	**JGw**
scale	**1:1,500 @ A3**	QA	**JFr**

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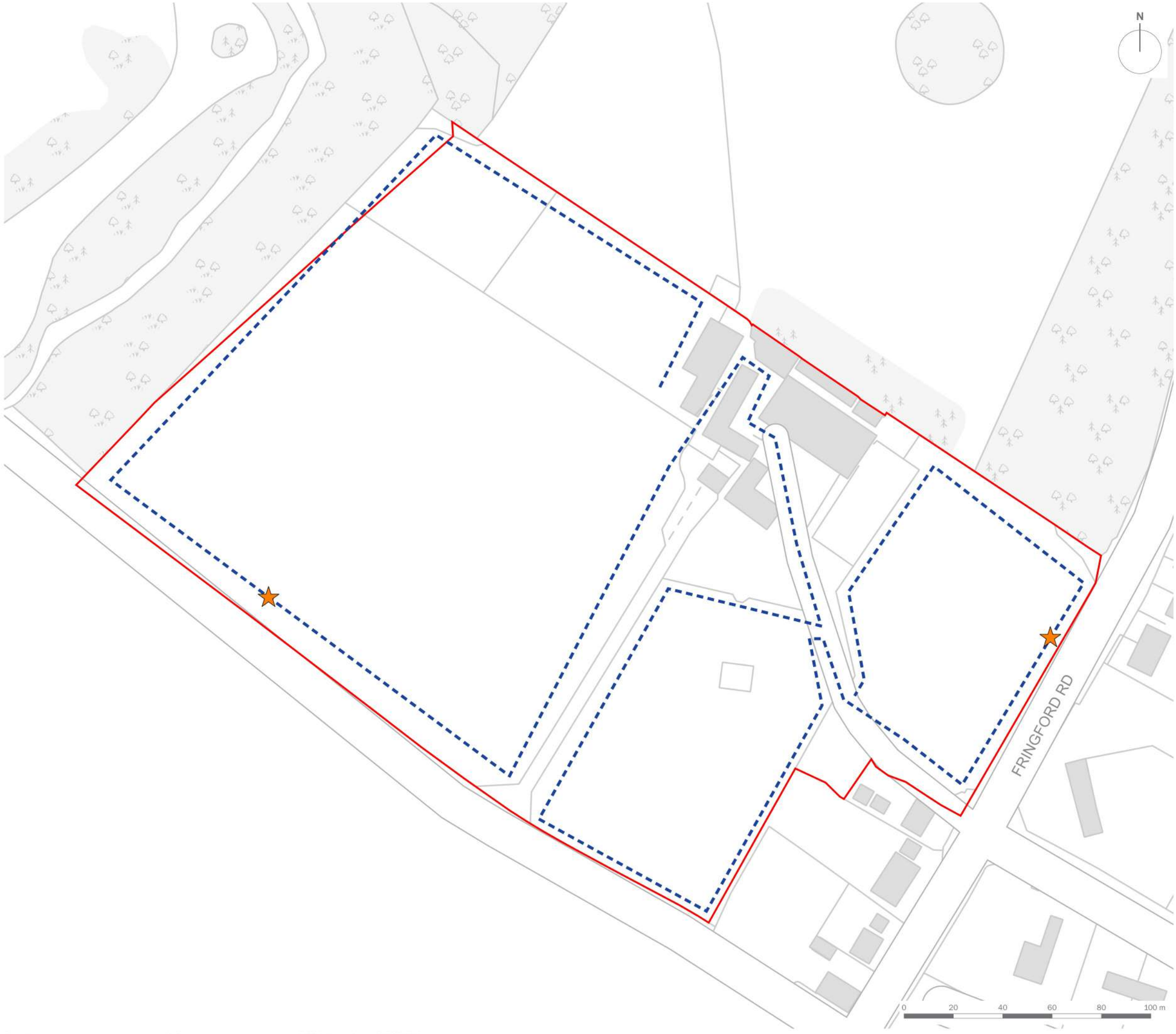

Site Boundary

Transect Route

Automated Bat Detector Location

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Land West of Fringford Road, Caversfield

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Transect Routes and Automated Bat Detector Locations

date	**19 DECEMBER 2023**	drawn by	**GYo**
drawing number	**edp7205_d007a**	checked	**JGw**
scale	**1:1,500 @ A3**	QA	**JFr**

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Site Boundary

Common Pipistrelle

Soprano Pipistrelle

Noctule

Serotine

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Dusk Transect Bat Activity Survey – 20 June 2023

date	**19 DECEMBER 2023**	drawn by	**GYo**
drawing number	**edp7205_d008a**	checked	**JGw**
scale	**1:1,500 @ A3**	QA	**JFr**

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Site Boundary

Common Pipistrelle

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Land West of Fringford Road, Caversfield

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Dusk Transect Bat Activity Survey – 24 July 2023

date	**19 DECEMBER 2023**	drawn by	**GYo**
drawing number	**edp7205_d009a**	checked	**JGw**
scale	**1:1,500 @ A3**	QA	**JFr**

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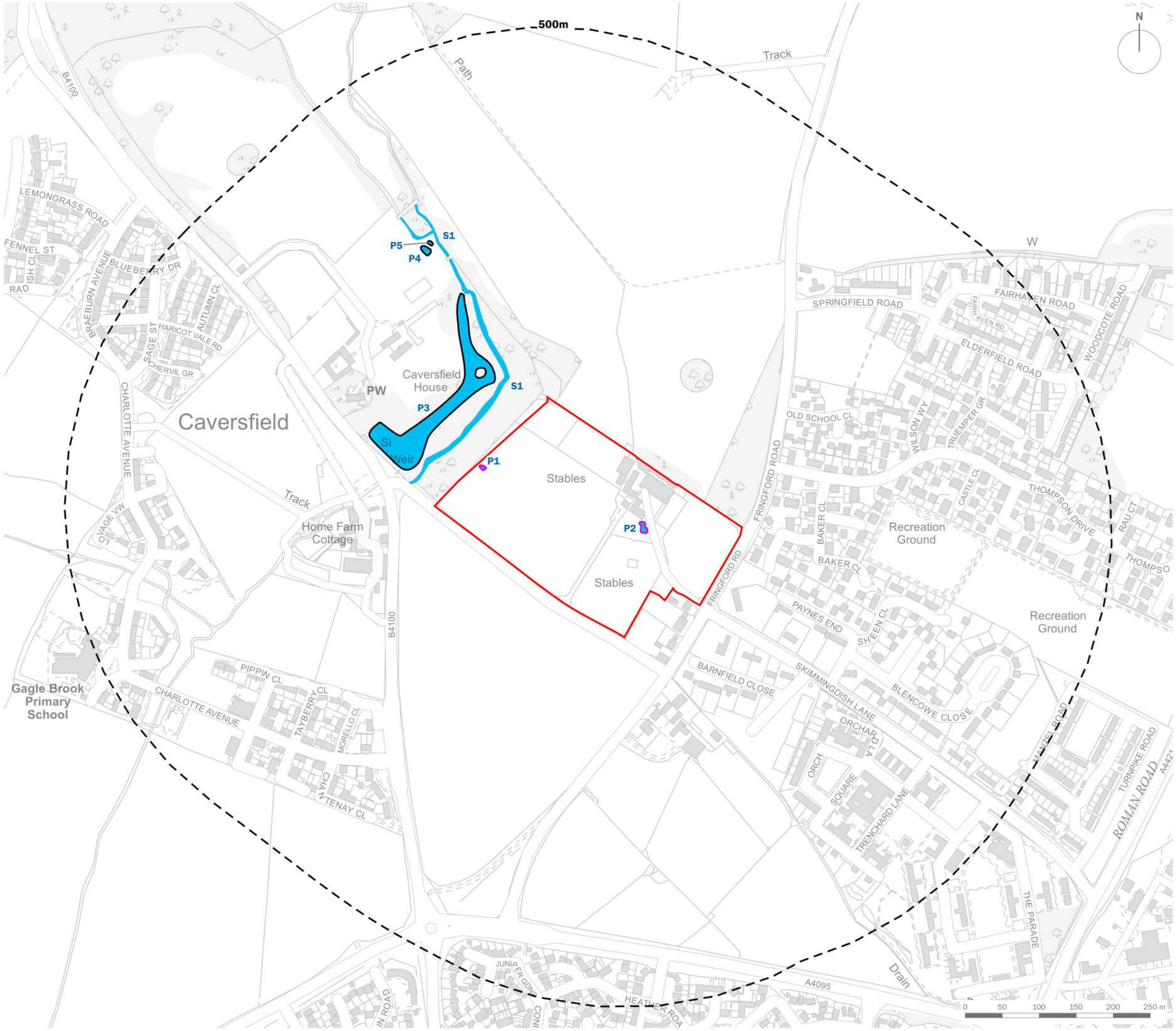

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Land West of Fringford Road, Caversfield

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Ponds within 500m of the Site

date	**19 DECEMBER 2023**	drawn by	**GYo**
drawing number	**edp7205_d005a**	checked	**JGw**
scale	**1:5,000 @ A3**	QA	**JFr**

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Site Boundary

Reptile Mats

Common Lizard

Adult Grass Snake

Juvenile Grass Snake

Snake Skin

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Reptile Survey Results

date	**19 DECEMBER 2023**	drawn by	**GYo**
drawing number	**edp7205_d011a**	checked	**JGw**
scale	**1:1,500 @ A3**	QA	**JFr**

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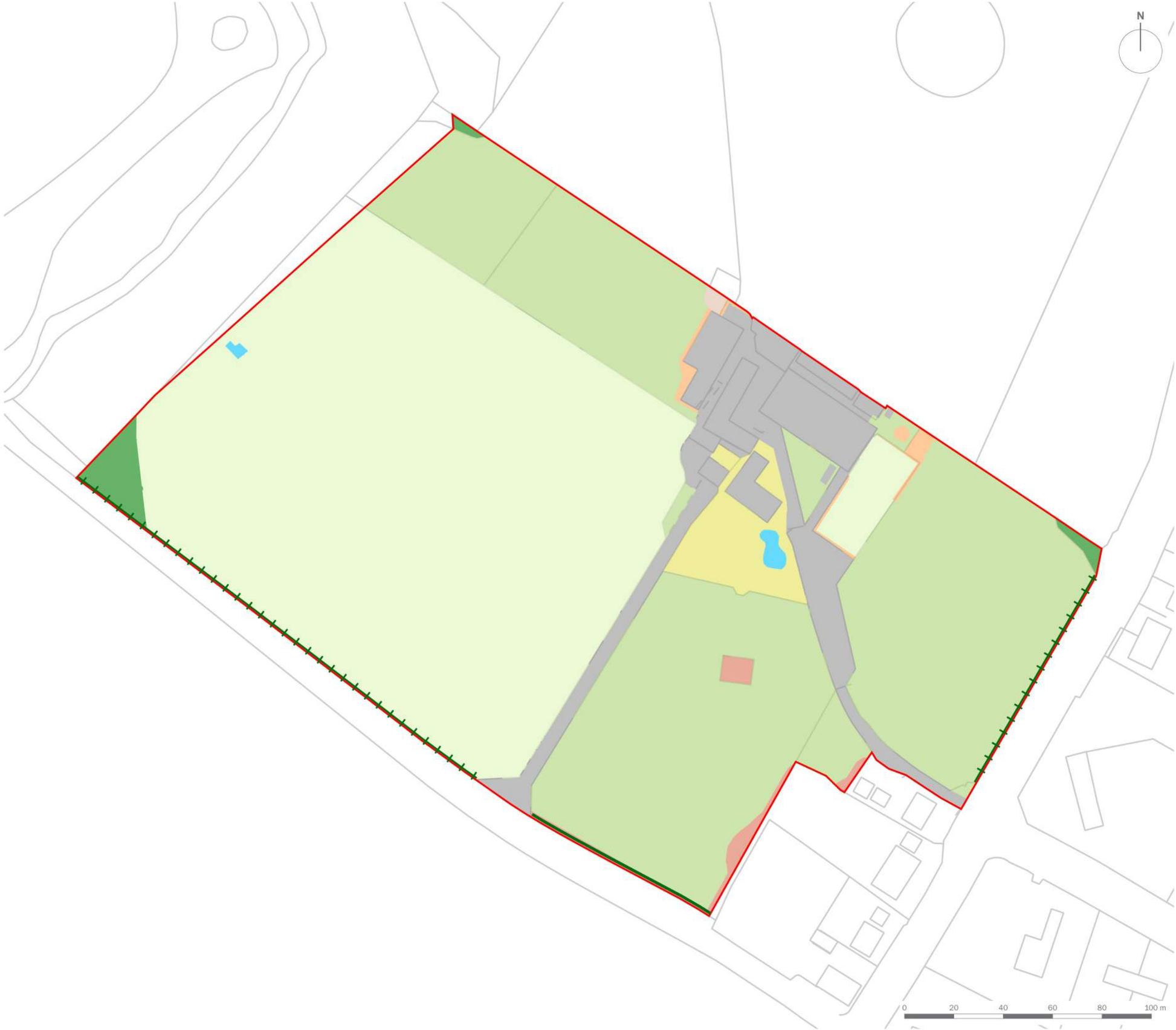

- Site Boundary
- Artificial Unvegetated, Unsealed Surface
- Bramble Scrub
- Developed Land; Sealed Surface
- Mixed Scrub
- Modified Grassland
- Other Neutral Grassland
- Ponds (Non-priority Habitat)
- Ruderal/Ephemeral
- Vegetated Garden
- Native Hedgerow
- Native Hedgerow with Trees

client

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Land West of Fringford Road, Caversfield

drawing title

Biodiversity Net Gain Assessment: Baseline Habitats

date	**19 DECEMBER 2023**	drawn by	**DJo**
drawing number	**edp7205_d012a**	checked	**EDe**
scale	**1:1,500 @ A3**	QA	**JFr**

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Site Boundary

Enhanced Habitats

- Lowland Meadows
- Mixed Scrub
- Other Neutral Grassland
- Species-rich Native Hedgerow with Trees

Retained Habitats

- Modified Grassland
- Other Neutral Grassland

Created Habitats

- Artificial Unvegetated, Unsealed Surface
- Bioswale
- Developed Land; Sealed Surface
- Lowland Meadows
- Mixed Scrub
- Modified Grassland
- Other Neutral Grassland
- Ponds (Non-priority Habitat)
- Sustainable Drainage System
- Traditional Orchards
- Vegetated Garden
- Species-rich Native Hedgerow
- Urban Tree (Small)

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Biodiversity Net Gain Assessment: Proposed Habitats

date	**20 DECEMBER 2023**	drawn by	**JFr**
drawing number	**edp7205_d014**	checked	**EDe**
scale	**1:1,500 @ A3**	QA	

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URBAN DESIGN GROUP REGISTERED PRACTICE

IEMA CORPORATE PARTNER

Landscape Institute
Registered practice