



ecosupport

Ecological Impact Assessment

Land at Moorlands Farm, Hedge
End

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Client:

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Executive Summary

Ecosupport Ltd was instructed by Country Homes Ltd to undertake a Preliminary Ecological Appraisal (PEA) of buildings and habitats associated with Moorlands Farm, Hedge End, in order to identify any potentially important ecological features that may be affected by the proposed development.

As part of this assessment, the following surveys were undertaken:

- Desktop survey submitted to the Hampshire Biodiversity Information Centre (HBIC) (November 2020)
- Extended phase I habitat survey (November 2020 & August 2022)
- Preliminary roost assessment (buildings) (November 2020 & August 2022)
- Reptile surveys (August & September 2021)
- Dormouse (*Muscardinus avellanarius*) survey (June to November 2021)
- Phase II Bat Emergence/Re-entry Surveys (June-July 2021)

The following important ecological features were identified on site following the conclusion of the above survey work and may be subject to adverse impacts in the absence of suitable mitigation / compensation:

- 1 building with confirmed Common and Soprano Pipistrelle summer day roosts
- Low-moderate usage of the site by foraging and commuting bats
- Suitable habitat for breeding and nesting birds
- Confirmed medium population of Grass Snakes (*Natrix natrix*)
- Adjacent statutory designated site

In the absence of any mitigation measures, the proposed development is anticipated to result in **certain adverse effects** (significance level to be determined following additional survey work).

Suitable mitigation and enhancement measures are outlined within section that will accompany this document following the conclusion of the additional survey work recommended.

1.0 INTRODUCTION

1.1 Brief

Ecosupport Ltd was commissioned by Country Homes Ltd to conduct a Preliminary Ecological Appraisal (PEA) of buildings and habitats associated with Moorlands Farm, Hedge End. The purpose of this survey was to assess any ecological impacts that may arise as a result of the proposed development.

Between November 2020 – November 2021 Ecosupport Ltd had been undertaking Phase II Ecological surveys and had continual site presence to complete these works. A subsequent updated walkover was then completed in August 2022 to check the status of the site and to support a new full planning application. These surveys are required to confirm the Ecological value of the site and the scale of ecological impacts associated with the proposed development.

NB If the development does not take place within 18 months¹ of this report then the findings of this survey will no longer be considered valid and may require updating.

1.2 Aim

A Preliminary Ecological Appraisal is the first step in assessing the potential ecological effects (or lack of) of a proposed development, and determines whether or not (and which) Phase II Protected Species Surveys are required. The objectives of this survey were as follows:

- Identify current land use and distribution of broad habitat types including plant communities of ecological importance,
- Identify and classify any priority habitats,
- Assess the ecological value of the site,
- Identify any signs of protected species and potential features that may support them,
- Identify all relevant legislation and policy,
- Make recommendations for further survey work as appropriate,
- Make recommendations for appropriate enhancements.

The aim of Phase II protected species surveys is to confirm the presence/likely absence of species to aid the assessment of the ecological value of the site and potential ecological effects (or lack of) of a proposed development. The results of the survey work also provide evidence to support associated mitigation and compensation.

1.3 Site Description & Location

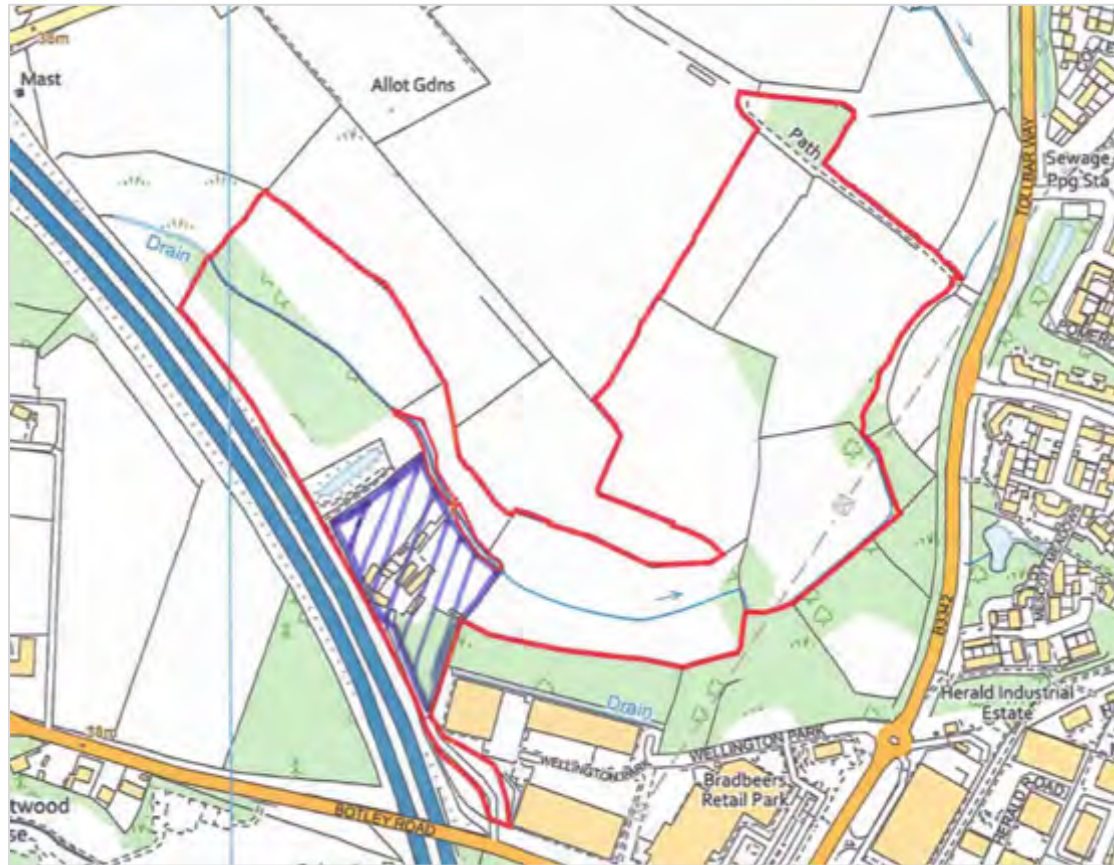
The site comprises of areas of unmanaged amenity grassland, unmanaged semi-improved grassland, areas of scrub, ponds, hardstanding, buildings, scattered trees and woodland. The site is located at Moorlands Farm, Hedge End, Hampshire, SO30 3HD (centred on OS grid reference SU 48172 14502) (**Fig 1**).

The wider landscape to the north of the site includes small areas of woodland, the Moorgreen allotments and agricultural fields. The wider environment to the south and east of the site is

¹ <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf>

primarily urban, comprising of commercial, industrial and residential. The M27 separates the site along the west, from urban commercial and residential.

Figure 1. The redline displays the approximate ownership boundary, the blue line is the area this report covers.



1.4 Proposed Development

At this stage it is understood the proposals will entail Demolition of all existing buildings and detailed planning approval for light industrial floorspace [Use Class E(g)(ii) & E(g)(iii)], warehouse floorspace [Use Class B8] and estate office (Use Class E(g)(i)).

2.0 RELEVANT LEGISLATION AND POLICY

2.1 Legislation

2.1.1 The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019)

This instrument makes changes to the three existing instruments which transpose the Habitats and Wild Birds Directives so that they continue to work (are operable) upon the UK's exit from the European Union (EU). These include The Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017. This instrument also amends section 27 of the Wildlife and Countryside Act 1981 to ensure existing protections continue. The intention is to ensure habitat and species protection and standards as set out under the Nature Directives are implemented in the same way or an equivalent way when the UK exits the EU.

This transposes the EU Habitats Directive (Council Directive 92/43/EEC) into UK domestic law. It provides protection for sites and species deemed to be of conservation importance across Europe. It is an offence to deliberately capture, kill or injure species listed in Schedule 2 or to damage or destroy their breeding sites or shelter. It is also illegal to deliberately disturb these species in such a way that is likely to significantly impact on the local distribution or abundance or affect their ability to survive, breed and rear or nurture their young.

In order for activities that would be likely to result in a breach of species protection under the regulations to legally take place, a European Protected Species (EPS) licence must first be obtained from Natural England.

2.1.2 The Wildlife and Countryside Act (1981) (as amended)

This is the primary piece of legislation by which biodiversity is protected within the UK. Protected fauna and flora are listed under Schedules 1, 5 and 8 of the Act. They include all species of bats, making it an offence to intentionally or recklessly disturb any bat whilst it is occupying a roost or to intentionally or recklessly obstruct access to a bat roost. Similarly, this Act makes it an offence to kill or injure any species of British reptiles and also makes it an offence to intentionally kill, injure or take any wild bird or to take, damage or destroy their eggs and nests (whilst in use or being built).

2.1.3 The Countryside and Rights of Way Act (2000)

This Act places a duty on Government Ministers and Departments to conserve biological diversity and provides police with stronger powers relating to wildlife crimes.

2.1.4 NERC Act

The Natural Environment and Rural Communities (NERC) Act 2006 requires that public bodies have due regard to the conservation of biodiversity. This means that Planning authorities must consider biodiversity when planning or undertaking activities. Section 41 of the Act lists species found in England which were identified as requiring action under the UK Biodiversity

Action Plan and which continue to be regarded as conservation priorities under the *UK Post – 2010 Biodiversity Framework*.

2.1.5 Protection of Badgers Act

The Protection of Badgers Act (1992) relates to the welfare of Badgers (*Meles meles*) as opposed to nature conservation considerations. The Act prevents:

- The wilful killing, injury, ill treatment or taking of Badgers and / or
- Interference with a Badger sett
- Damaging or destroying all or part of a sett
- Causing a dog to enter a set and
- Disturbing a Badger while it is occupying a sett

Provisions are included within the Act to allow for the lawful licensing of certain activities that would otherwise constitute an offence under the Act.

2.1.6 Overview of Legal Protection of Bats

All bat species, and their roosts, are afforded full legal protection in the UK, by a selection of legislation (both domestic and international). Under this collection of legislation, it is an offence to:

- Deliberately take, injure or kill a wild bat
- Intentionally or recklessly disturb a bat in its roost or deliberately disturb a group of bats
- Damage or destroy a bat roost or maternity site (even if bats are not occupying a roost at the time of such impact)
- Intentionally or recklessly obstruct access to a bat roost

This interpretation is provided by the Bat Conservation Trust (2019).

2.2 Policy

2.2.1 National

Section 15 of the National Planning Policy Framework (NPPF) (2021) 'Conserving and enhancing the natural environment' states that planning policies and decisions should contribute to and enhance the natural environment. They should do this by protecting and enhancing sites of biodiversity and minimising impacts on and providing net gains for biodiversity, including establishing coherent ecological networks.

The plan states to protect and enhance biodiversity plans should identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks. This includes the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them. Plans should identify the protection and recovery of priority species and opportunities for securing measurable net gains for biodiversity.

When determining planning applications, local planning authorities should apply the following principles:

- if significant harm to biodiversity resulting from a development cannot be avoided, adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
- development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact;
- development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists; and
- development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

2.2.2 Local – Eastleigh Borough Council

New Strategic Policy S10 'Green Infrastructure' is subject to proposed amendments that are currently out to public consultation. These include re-numbering the Policy to S9 Green Infrastructure which is still to seek the provision of connected habitats, linking the network of designated sites and existing priority sites.

This new strategic policy cross-refers to new Policy DM11 Nature Conservation which is also proposed to be amended to read...

'Policy DM11, Nature conservation

General Approach

1. The Council will work with statutory and voluntary agencies and developers, and will determine planning applications, to:

a. Protect, conserve and enhance all:

- i. international, national and local nature conservation designations; and*
- ii. networks of natural habitats and features, including the Local Ecological Network, Priority Biodiversity Areas and Priority Biodiversity Links, watercourses, wetland complexes, woodland trees, and trees and hedgerows important to biodiversity and local character;*

and facilitate their adaptation to climate change wherever possible;

b. Assist in achieving national, county and local biodiversity targets as set out in Biodiversity Action Plans (BAPs);

c. Seek a net gain of biodiversity on all development sites (including sites for redevelopment) through the protection, enhancement and connection of existing and provision of new habitats and features of nature conservation interest compatible with the native biodiversity characteristics of the Borough, having regard to local geodiversity and soils; and

d. Contribute to major elements of the PfSH Green Infrastructure Strategy and other strategies for the provision and enhancement of multifunctional green infrastructure including green routes, ecological networks and biodiversity enhancements (see strategic policy S910).

International Designations

2. Development which is likely (either individually or in combination with other developments) to adversely affect the integrity of an international or European nature conservation site will not be permitted subject only to imperative reasons of overriding public interest in the absence of alternative solutions. A 'project level' Habitat Regulations Assessment will be required. Any mitigation measures required to ensure no adverse impact must be implemented at the appropriate time.

3. The Council will work with PfSH, Natural England, the Environment Agency and other wildlife organisations to develop and implement with developers a strategic approach to the protection and enhancement of international and European sites from the direct and indirect effects of development. Within Eastleigh Borough this will include:

a. Implementing:

i. the Solent Recreation Mitigation Strategy (requiring contributions from residential developments within 5.6 kilometres of the Solent Special Protection Area to the Strategy); and
ii. the interim and any future New Forest Recreation Mitigation Strategy if required;
or alternative agreed site specific measures to address recreational disturbance;

b. preserving the water quality and flows within the Itchen and Hamble, Southampton Water and Solent;

c. protecting the River Itchen SAC, in particular the maintenance and where appropriate restoration of habitats and qualifying species to favourable conservation status (as defined by article 1 of the Habitats Directive); and

d. seeking contributions towards measures set out in the Southern Damselfly Conservation Strategy (or other strategy) specifically to deliver biodiversity net gain.

National and Local Designations

4. Development will not be permitted if it is likely (either individually or in combination with other developments) to have a direct or indirect adverse effect on a Site of Special Scientific Interest (SSSI), Site of Importance for Nature Conservation (SINC) or Local Nature Reserve (LNR)

as shown on the policies map (or on a more recent plan provided by the Hampshire Biodiversity Information Centre) unless it can be demonstrated that:

- a. there are no alternative solutions;*
- b. the adverse effects are unavoidable;*
- c. measures are taken to mitigate or, as a last resort, compensate for the adverse effects;*
- d. there is an overall biodiversity net gain; and*
- e. if there are any residual adverse effects, the benefits of the development clearly outweigh the adverse effects on the nature conservation value of the site and any broader impacts on national and local designations.*

Priority habitats, protected and priority species and the local ecological network

5. Development will not be permitted if it is likely (either individually or in combination with other developments) to have a direct or indirect adverse effect on priority habitats, protected or priority species, or on the local ecological network unless it can be demonstrated that:

- a. there are no alternative solutions;*
- b. the adverse effects are unavoidable;*
- c. measures are taken to mitigate or, as a last resort, compensate for the adverse effects;*
- d. there is an overall biodiversity net gain; and*
- e. if there are any residual adverse effects, the benefits of the development clearly outweigh the adverse effects on priority habitats, priority and protected species, and the local ecological network.*

Irreplaceable habitats

6. Development will not be permitted if it results in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees), unless there are wholly exceptional reasons and a suitable compensation strategy exists.

Buffers

7. Buffers free from development will be provided to designated sites to avoid/mitigate impacts, including recreational impact and impacts on edge habitats, and to maintain dark skies.

Surveys

- 8. Development will not be permitted unless it can be demonstrated that:*
- a. there have been thorough habitat and species surveys;*
 - b. the great crested newt strategic survey and strategy have been considered in all developments within 500m of a great crested newt pond; and*
 - c. the strategic bat trapping survey has been considered in all developments within the locality of a woodland or connected habitat networks.'*

2.3 Biodiversity Action Plans & UK Post-2010 Biodiversity Framework

The UK Post-2010 Biodiversity Framework (JNCC & DEFRA, 2010) supersedes the UK Biodiversity Action Plan 1992-2012 (UKBAP), setting out goals relating to nature conservation at a UK scale, for example the reduction and reversal in the decline of threatened species and improving the status of biodiversity. The specific habitats and species contained within the

UKBAP continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework, and are required to be a material consideration in the planning process under the 2019 NPPF.

3.0 METHODOLOGY

3.1 Desk Study

3.1.1 Data Request

A data request was submitted to the Hampshire Biodiversity Information Centre (HBIC) in order to ascertain any records held of nature conservation designations and protected species within 2 km of the boundary of the site.

The data search covered:

- Statutory designated sites
- Non-statutory designations such as SINC
- Records of protected and notable species.

3.1.2 Waterbodies

Any ponds located within 500 m of the proposed development were searched for using Ordnance Survey maps and available aerial images.

3.2 Field Survey

3.2.1 Habitats

The field survey work which forms the basis of the findings of this report was carried out by Holly Maynard MRes, BSc (Hons) (4 years post-graduation experience), with assistance from Julie Trelvelick and Zenobia Hatch BSc (Hons) on the 26th of November 2020. This was subsequently updated by Lyndsey McBean BSc (Hons) PGCert ACIEEM (NE class level I bat licence number 2018-38386-CLS-CLS; NE class level I Dormouse licence number 2020-44360-CLS-CLS; NE class level I GCN licence number 2022-10446-CL08-GCN) with assistance from Katalin Balacz and Amy Johnston on 16th August 2022.

The Phase 1 Habitat survey (JNCC, 2010) methodology was adopted which is a method of classifying and mapping wildlife habitats in Great Britain. It was originally intended to provide “...relatively rapidly, a record of semi-natural vegetation and wildlife habitat over large areas of the countryside”. The standard Phase 1 Habitat survey methodology has been ‘extended’ in this report to include the following:

- Floral species lists for each identified habitat;
- Descriptions of habitat structure, the evidence of management and a broad assessment of habitat condition;
- Mapping of additional habitat types (e.g. hardstanding);
- Identification of Priority Habitats under Section 41 of the NERC Act;
- Evidence of, or potential for, the presence of certain species/groups

3.3 Biodiversity Net Gain

3.3.1 Habitat Assessment

Habitats on site pre-development were identified in accordance with the categories specified for a UK Habitats survey, using Habitat Definitions Version 1.1 (UKHab Ltd., 2020). This was

chosen as an appropriate habitat categorisation system as it fits within the Biodiversity Metric 3.1 calculation.

A condition assessment, in line with the Biodiversity Metric 3.1 Technical Supplement, was carried out on the Site on the 14th April 2022. The area of identified habitats is calculated in hectares (ha), ignoring linear features or ditches (the area is measured to the centre line of such features). The length of linear features is measured separately in kilometres (km). The dominant habitat type was selected, according to those defined by UKHab Ltd (2020). Where there was disparity between the UK classification for habitat type and those present within the Biodiversity Metric 3.0 calculator tool, this was noted within the condition assessment tables.

3.3.2 Habitat Distinctiveness

Each habitat was assigned a score for distinctiveness, according to the Biodiversity Metric 3.1 calculator tool and Technical Supplement (Natural England, 2022). This ranged from Poor - High for most habitats, or Not Applicable (e.g. Developed Land – Sealed Surface). Using the tool, habitats were assigned a score based on their distinctiveness.

3.3.3 Habitat Condition

The condition of each habitat was assessed following criteria set out in the Biodiversity Metric 3.1 Technical Supplement (Natural England, 2021), which includes detailed assessment criteria for different habitats. Full results of the condition assessments can be found within **Section 4.10**. The condition of each habitat was assessed individually on site but was found to be the same for each type across the site. Therefore, the results of the habitat condition for each habitat are grouped together for each habitat.

3.4 Badger

The site was thoroughly searched for evidence of use by Badgers (*Meles meles*), with the specific aim of identifying the presence and location of any setts. In accordance with the *Badgers and Development: A Guide to Best Practice and Licensing* (Natural England, 2011) guidance, the survey accounted for a 30m from the site's boundary (observed where possible i.e. does not conflict with private dwellings). Evidence of Badgers could include latrines, dung pits, feeding remains and foraging evidence, trails and setts.

3.5 Bats

3.5.1 Preliminary Roost Assessments

An assessment was made of the suitability the buildings and trees on site to support roosting bats based on the presence of any Potential Roost Features (PRFs). This involved the use of 8 x 42 close focus binoculars and a high-powered torch (where required) for a more detailed inspection of any features along with an internal inspection of the accessible loft space. The survey conformed to current best practice guidance as described *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016) and was undertaken by Holly Maynard MRes BSc (Hons) (working as an accredited agent under licence number 2015-14147-CLS-CLS), with assistance from Julie Trellick and Zenobia Hatch BSc (Hons) on the 26th of November 2020. This was subsequently updated by Lyndsey McBean BSc (Hons) PG Cert ACIEEM (NE bat licence number 2018-38386-CLS-CLS) on the 16th August 2022.

3.5.2 Bat Emergence Surveys

3.5.2.1 Justification of Survey Effort

During the Phase II surveys in 2016, the residential dwelling on site was confirmed as a bat roost for low numbers of Common Pipistrelles. In addition, during the updating PEA undertaken in April 2020, the following buildings, as outlined in Table 1, were identified as having potential for roosting bats and therefore subsequently surveyed between the 7th of July 2020 and the 7th of August 2020.

Table 1. Recommended surveys at Belmont Farm (as per BCT, 2016). Please note building references are as per those illustrated in **Fig 2**.

Building	Assessment (2020)	Further Surveys Required
Building 1- Main dwelling	High potential	Three separate survey visits one dusk emergence and a separate dawn re-entry survey, the third visit can be dusk or dawn. Surveys to be undertaken between May – September with at least two surveys between May and August.
Building 2-Pigsty	Low potential	One survey visit - one dusk emergence or dawn re-entry survey. Surveys to be undertaken between May – August.
Building 4- Stable	Low potential	One survey visit - one dusk emergence or dawn re-entry survey. Surveys to be undertaken between May – August.
Building 6- Storage unit	Low potential	One survey visit - one dusk emergence or dawn re-entry survey. Surveys to be undertaken between May – August.

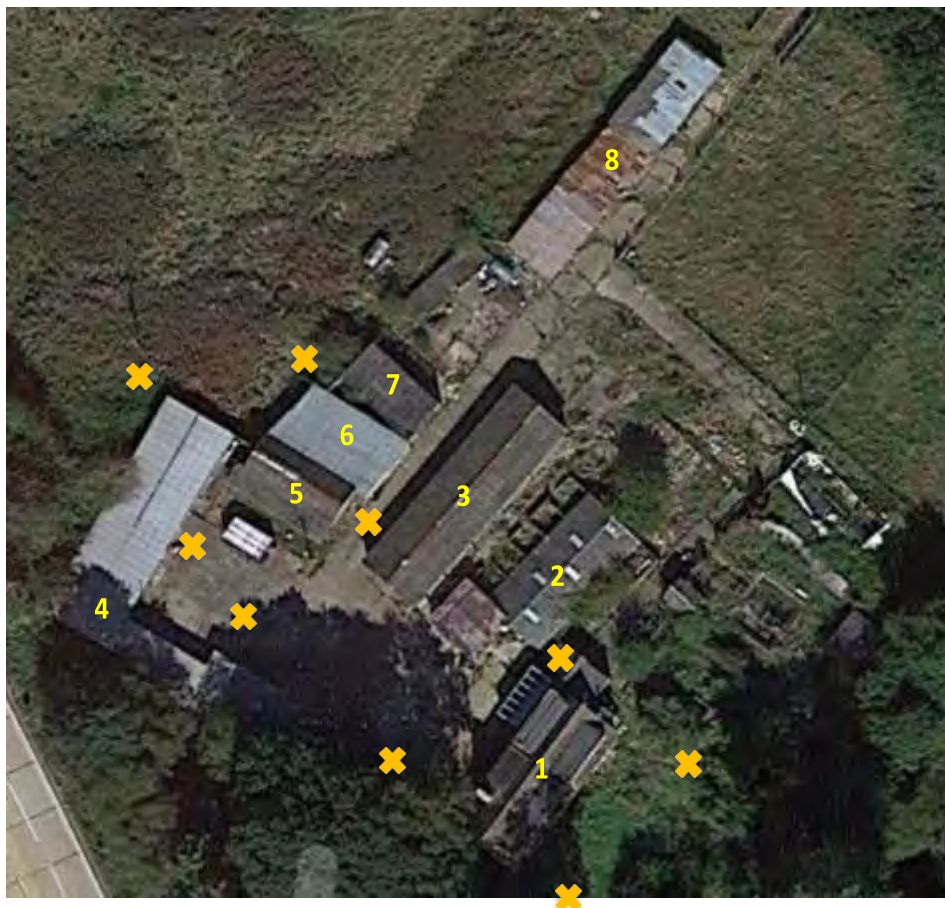
3.5.2.2 Methodology

The bat surveys on the main dwelling and outbuildings were led by Lyndsey McBean (Level 1 class license number 2018-38386-CLS-CLS), Sam Kelly (Level 1 class license number 2021- 51437-CLS-CLS) and Leah Murphy (working under 2018-38386-CLS-CLS), with assistance from Ashleigh Domblides, Lucie Hartmann, Lewis Lakudzala, Nick Saville, Rebecca Gane, Hannah McCabe, Leesha Hicks, Maddie Errington, Russell Brewer, Sam Wilson, Gregory Barratt and Harry Horn (all experienced surveyors with Ecosupport) (with the approximate locations of the surveyors indicated in **Fig 2**). Both heterodyne (Bat Box Duet, Peterson D230 and Elkon Batscanner) and time expansion (Elekon Batlogger) detectors were used for identifying species calls / analysis of calls via sonogram (where required). The dusk emergence survey began approximately 15 minutes prior to sunset and continued until approximately an hour and 30 minutes after with the dawn survey starting 1 hour and 30 minutes

prior to sunrise and finishing 15 minutes after sunset. Survey sheets were used to record the following information:

- Time of call registration
- Species (if possible to identify using heterodyne detector)
- Location / activity
- Direction of flight (if seen)

Figure 2. Approximate locations of the surveyors covering the main dwelling and outbuildings (orange crosses) during the bat surveys (Google Maps 2021).



3.6 Assessment of Nearby Waterbodies to Support GCN

A Habitat Suitability Index (HSI) assessment based upon guidance published by Oldham et al. (2000) and ARG's Active Advice Sheet 5 (2010), was undertaken for 5 of waterbodies identified on site, to assess their potential to support breeding GCN.

HSI assessments consider the following factors to calculate the suitability of a pond to support breeding GCN:

- | | | |
|--------------------|----------------------------------|----------------------------------|
| • Location | • Water quality | • Number of ponds within 1km |
| • Surface area | • Shade | • Quality of terrestrial habitat |
| • Desiccation rate | • Presence of waterfowl and fish | • Macrophyte cover |

This gives a score between 0 and 1, which relates to the suitability of a pond to support GCN (Table 1)

Table 1. HSI score and pond suitability for GCN.

HSI Score	Pond Suitability for GCN
0.4 – 0.5	Poor
0.51 – 0.59	Below average
0.6 – 0.69	Average
0.7 – 0.79	Good
0.8 - 1	Excellent

3.7 Reptile Surveys

A reptile survey was carried out in August and September 2021 following best practice methodology described in a number of sources (Griffiths & Inns 1998, Froglife 1999, Sewell et al., 2013). Artificial refugia comprising of bitumen roofing felt and corrugated tin were distributed throughout all suitable reptile habitats on site, the location of which is shown in Fig 2. Eight visits to the site were subsequently undertaken during suitable weather conditions during which all the refugia were checked for the presence of reptiles in combination with a visual observation transect. Surveyors remained vigilant and visually searching for reptiles whilst walking between points. During warm weather reptiles are less inclined to utilise refugia and instead bask in the open.

Figure 2. The approximate locations of reptile mats (orange line) (n=40) set out in the site (Google Maps, 2021)



3.8 Dormouse Surveys

All hedgerows and woodland were considered suitable for Dormice (*Muscardinus avellanarius*) on site. As a result, a dedicated survey took place. Nest tubes were installed at 15-20-meter intervals along stretches of the hedgerows and within pockets of woodland within the site boundary (where these did not conflict with public rights of way). Nest tubes were made from a stiff plastic folded into a tubular square, 25cm in length with a 5 x 5cm cross-section, with a plywood tray sealing one end. 150 tubes were tied to the underside of suitable branches using wire and or cable ties. These were put in place in June 2021 and then were checked monthly between June and November. By carrying out the surveys over these months the survey effort achieves a score of 20 for thoroughness². Guidelines state that the score should be no less than 20, therefore the survey effort expended was considered to be adequate and incorporated two of the best months (August and September). The approximate locations of the habitats on site covered by the nest tubes is outlined in **Fig 3** below.

² This is based on the standard 50 tubes and index of probability of finding dormice present in nest tubes as per Bright et al 2006.

Figure 3. Location of Dormouse nest tubes on-site (yellow dashed lines) (n=50) (Google Maps, 2021)



3.9 Assessment Methodology

The methodology for the assessment of the likely ecological effects of the proposed development is based on CIEEM's Guidelines for Ecological Assessment in the UK and Ireland (CIEEM, 2018). The guidelines provide a useful framework for assessing ecological impacts at any level.

The approach of the guidelines is to assess potential impacts to all features of ecological interest that could be affected by a scheme. As a scheme may have effects beyond its boundaries, it is important to identify the 'zone of influence' of the scheme and to assess the potential for significant ecological impacts throughout this zone as well as those within the application boundaries, for example impacts upon nearby species, habitats and sites designated for their nature conservation value. Where such features are identified, they are first valued and then assessed as to the likely magnitude and significance of potential impacts that may be exerted upon those features by the proposed scheme. 'Significant' impacts are considered to be where they affect the integrity and/or conservation status of a designated site for a habitat or species. All potential significant impacts are considered in the absence of any avoidance, mitigation or compensation to inform the suitable design of such measures (where necessary), which can then be incorporated into the scheme to reduce such impacts. Finally, an assessment is made to identify any residual impacts upon these features (both positive and negative) that would remain once any impact avoidance, mitigation or compensation measures have been implemented.

All ecological features identified within the site boundaries and the identified zone of influence of the proposals are considered within a defined geographical context, as follows:

- International
- National
- County
- District
- Local
- Site

The guidelines state that ecological features that are valued, under the ecological assessment of a scheme, to be of less than local value are not considered sufficiently valuable for an impact to be considered significant. Therefore, only those features assessed as being of at least local value require avoidance, mitigation and/or compensation. That said, where a feature is of less than local value but where impacts upon this feature hold the potential to result in contravention of relevant wildlife legislation, measures must be implemented to ensure compliance with legislation, regardless of the level of value of the feature.

Potential impacts are considered at all stages of the proposed development. The assessment should consider all types of impact (both direct and indirect) and whether potential impacts are short, medium, long-term, permanent, temporary, reversible, irreversible, positive and/or negative.

3.10 Limitations

For Health and Safety reasons (the buildings were structurally unstable and the dwelling was boarded up), it was not possible to undertake a full internal examination of the buildings

onsite to either assess their suitability to support roosting bats or to search for evidence that might confirm such use; as Phase II surveys will be recommended as part of the PEA report's findings, this was not considered to represent a significant limitation to the overall assessment.

No other limitations were identified.

4.0 ECOLOGICAL BASELINE

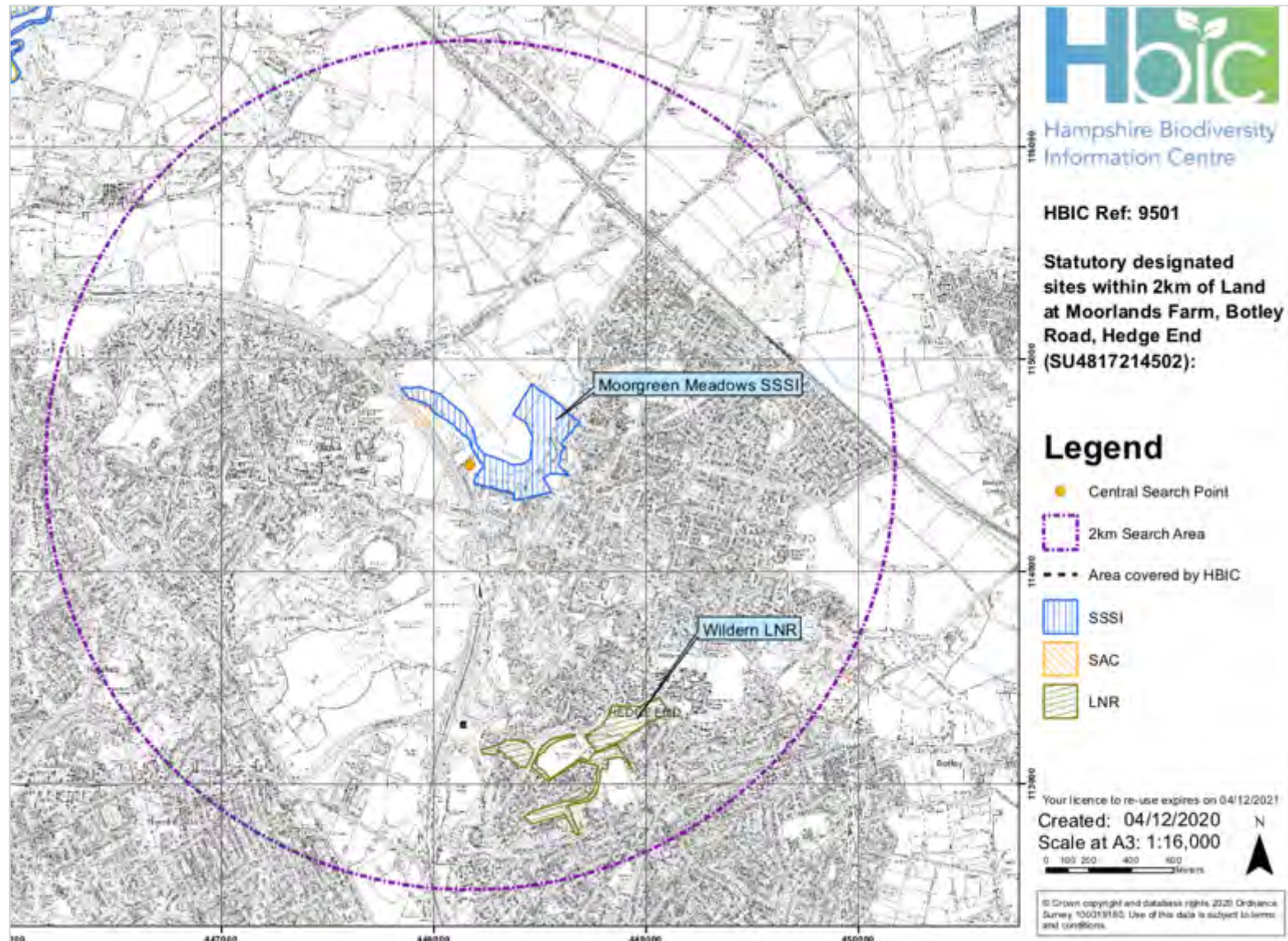
4.1 Designated Sites

4.1.1 Statutory

The HBIC data request has identified the following statutory designated sites located within 2km of the site (shown in **Fig 4**):

- Moorgreen Meadows SSSI (adjacent to the site on its S, E and N boundaries)
- Wildern LNR (1.315km SE)

Figure 4. Map provided by HBIC which indicates the proximity of the site to the nearby statutory designations.



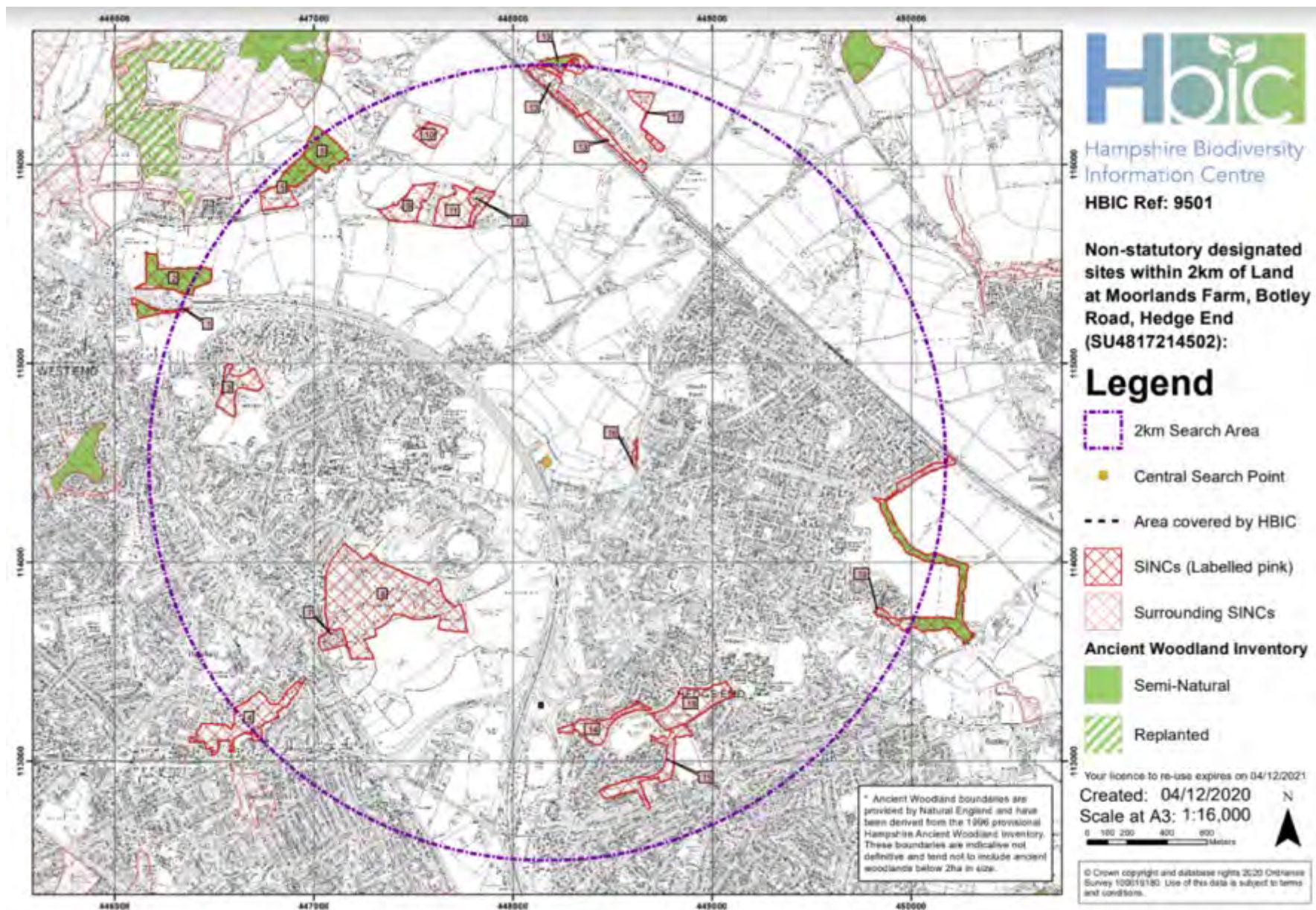
4.1.2 Non-Statutory

A total of 16 SINC's were identified as falling within the 2km search radius by HBIC (**Table 2 and Fig 5**).

Table 2. SINC's within 2km of Moorlands Farm.

Map label for Fig 3	SINC	SINC Criteria	Species supported that meet Section 6 of SINC selection criteria	Closest proximity to site (distance, km, and direction)
16	Moorgreen Woodlands	1A/1Cii		0.427 E
8	Telegraph Woods	1D/3Bi		1.117 SW
11	Meadow adjacent to Home Covert	2B		1.287 NNW
14	Hogsty Corner	1A/1Cii/3Bi/5B		1.322 S
12	Home Covert, West End	1A		1.35 NNW
7	West End Covered Reservoir	2D/6A	<i>Anacamptis morio</i>	1.386 SW
18	Wildern Nature Park	1B/1Cii/2A/5B		1.404 SE
9	Winslowe House Meadow	2A		1.62 WNW
3	Hatch Grange Meadows	1Cii/2B		1.62 WNW
10	Copse by Oaklands House	1A/1Cii		1.697 NNW
17	Round Copse, West End	1A		1.751 NNE
15	Bridget Mary Garden	1Cii/2B		1.755 SSE
13	Chalcroft Distribution Park	1B		1.898 N
5	Withybed Covert / Ridgeway Copse	1A		1.9 NW
4	Harefield Copse	1B		1.96 SW
6	Bushy Copse, West End	1A		1.98 NW

Figure 5. Map provided by HBIC which indicates the proximity of the site to the nearby non-statutory designations. See **Table 2** for sites.

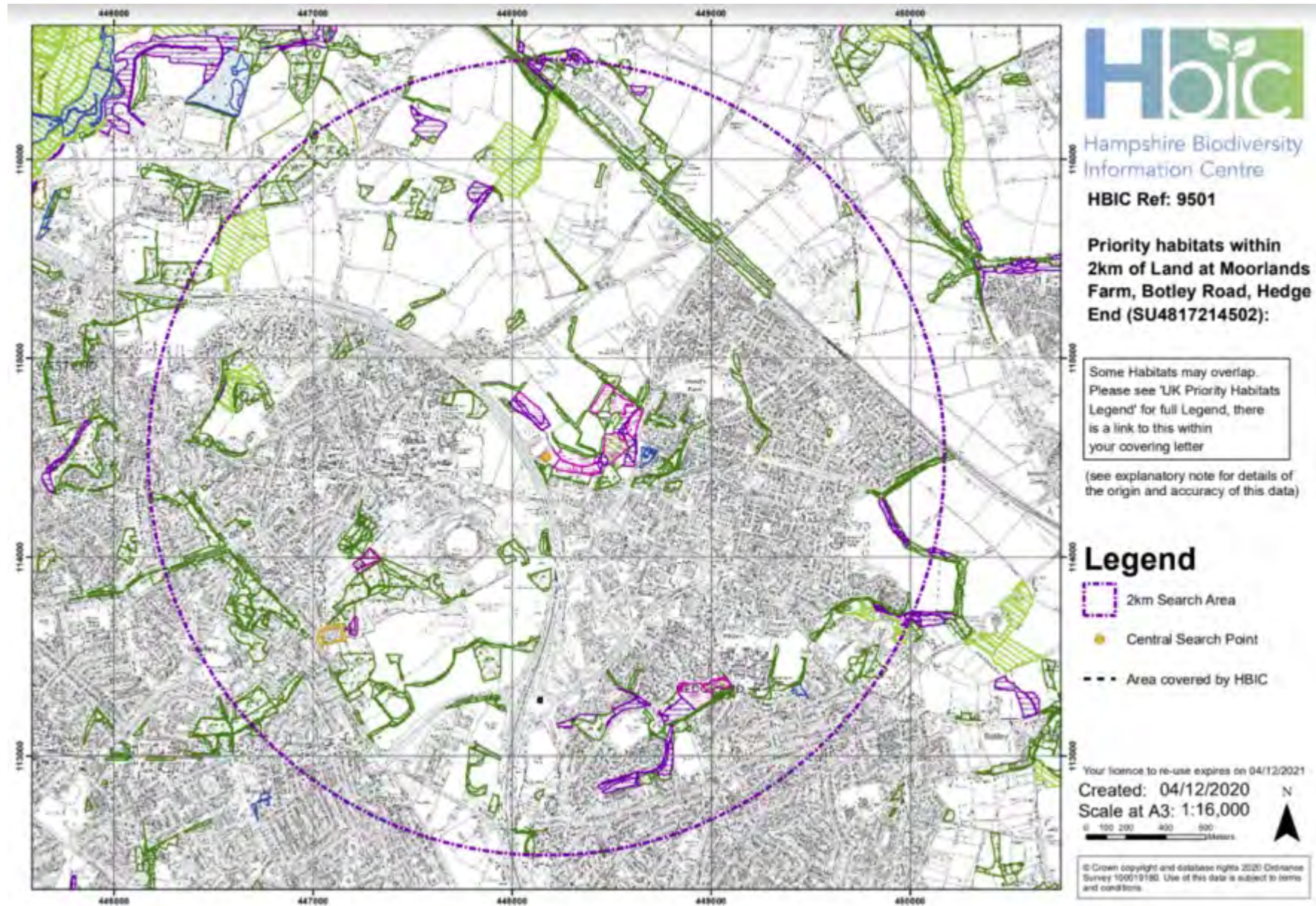


4.1.3 Priority Habitats

The HBIC data request has identified a priority habitat for Lowland Mixed Deciduous Woodland onsite, with additional priority habitats within 2km of the site and their corresponding map colour (shown in **Fig 6**):

- Lowland Mixed Deciduous Woodland (dark green) (on-site)
- Purple Moor Grass and Rush Pastures (pink)
- Lowland Fens (blue)
- Wet Woodland (purple horizontal lines)
- Coastal and Floodplain Grazing Marsh (light green diagonal lines)
- Lowland Dry Acid Grassland (orange)

Figure 6. Map provided by HBIC which indicates the proximity of the site to priority habitats.



4.2 Vegetation Survey Results

The vegetation within the site has been described below using the UKHab classification terminology as described with UKHab (2020). The below species noted should not be considered an exhaustive list and instead refer to dominant, characteristic, and other noteworthy species associated with each community within the survey area. These habitat descriptions should be read in conjunction with the UKHab map (**APPENDIX 2**). The habitat types on site comprise:

- Other neutral grassland- g3c (80)
- Modified grassland- g4 (66)
- Modified grassland/tall herb (not Annex 1)- g4 (16 11 366)
- Bramble scrub- h3d
- Bracken- g1c
- Developed land- u1b6
- Buildings- u1b5

4.2.1 g3c (80)- Other neutral grassland

Poor semi-improved grassland is predominantly located to the northwest of the site. Species present include Ragwort (*Senecio jacobaea*), Teasel (*Dipsacus fullonum*), European Gorse (*Ulex europaeus*), Sorrel (*Rumex acetosa*), Yarrow (*Achillea millefolium*), Common Vetch (*Vicia sativa*), Ribwort Plantain (*Plantago lanceolata*), Spear Thistle (*Cirsium vulgare*), Ground Ivy (*Glechoma hederacea*), Nettle (*Urtica dioica*), Buttercup (*Ranunculus bulbosus*) and *Juncus* spp (indicating seasonal wetness) (**Fig 7**). The grassland was found to be in poor condition on the most recent visit, with an absence of management resulting in the development of a rank structure.

Figure 7. Area of unmanaged poor semi-improved grassland to the northwest of the site (August 2022).



4.2.2 g4 (66)-Modified grassland

In the centre of the eastern border is an area of managed modified grassland. This area shows evidence of damage from vehicle use, creating patches of bare earth. Species recorded include Perennial Rye-grass (*Lolium perenne*), Buddleia (*Buddleja davidii*), Cock's-foot (*Dactylus glomerata*), Sorrel, Scentless Mayweed (*Tripleurospermum inodorum*), and Lesser Swine Cress (*Coronopus didymus*) and Common Nettle (**Fig 8**).

Figure 8. Area of unmanaged amenity grassland to the northwest of the site (August 2022).



4.2.3 g4 (16 11 366) Modified grassland/tall herb (not Annex 1)

The managed modified grassland was found to succeed into tall herb vegetation/early successional and nutrient tolerant species towards the south of the site, where previous vegetation clearance had taken place. Dominant species noted included Dock (*Rumex* spp, Nettle, low growth Bramble, Ragwort and Canadian Fleabane (*Erigeron canadensis*) and Common Hawkweed (*Hieracium vulgatum*) and False Oat Grass (*Arrhenatherum elatius*) (**Fig 9**). Trees including Beech (*Fagus sylvatica*), Oak (*Quercus robur*), *Buddleja* spp, Hazel (*Corylus avellana*) and Goat Willow (*Salix caprea*).

Please note, some of this area was found to be lowland deciduous woodland during the November 2020 walkover, this has since been felled and become overgrown with tall herb.

Figure 9. Tall herb communities developed in the southern half of the site (previously deciduous woodland) (August 2022).



Ponds

Pond 1 is located towards the southern corner of the rear garden of the derelict residential dwelling and is surrounded by an area of unmanaged modified grassland, tall herb and Bracken (**Fig 10**). The pond is artificial and elliptical in shape, approximately 2m x 2m in size, but devoid of water. The pond empty pond was filled with refugia/litter, leaf litter and some grass species were growing through the lining (indicating a damaged lining).

Figure 10. Pond 1, in the southern part of the rear garden of the residential dwelling (August, 2022).



Pond 2 is located to the northeast of the derelict dwelling, but still within the garden area. The pond also contained leaf litter and new plant growth. The pond was found to be empty, however was previously found to support a high percentage of duckweed cover (November, 2020) (**Fig 11**).

Figure 11. Pond 2, in the northern part of the rear garden (August, 2022).



Pond 3 was not located in the updated walkover, most likely due to a high density of Nettle growth within the area. Despite this, an additional small pond was noted close to the location of pond 3 (**Fig 12**). This pond supported raised sides and was heavily covered by Bramble growth. The pond was thought to measure approximately 2mx2m and supported poor water quality.

Figure 12. New pond identified to the south east of the dwelling (August 2022).



4.2.4 h3d- Bramble Scrub

Due to lack of management, an area of Bramble dominated scrub has developed within the centre of the site (**Fig 13**).

Figure 13. Area of scrub next to a scattered tree to the northeast of the derelict dwelling (August, 2022).



4.2.5 u1b6- Developed Land

A tarmac track leads into the site and an area of hard standing is located around the buildings on site. An additional gravel track leads from the buildings to towards the adjacent fields to the north east which currently has public access.

4.2.6 u1b5- Buildings

The final habitat type is buildings and these have been described in greater detail in **Section 4.4.2** as part of the preliminary roost assessment.

4.3 Protected Species Records from HBIC

Within 2km of the site and the previous ten years, the HBIC data request has identified a total of 44 protected species records. This includes three reptile, three terrestrial mammal, nine bat and 29 Bird of Conservation Concern Red Listed (BOCC Red) species. No protected species records have been recorded on site. Marsh Tit (*Poecile palustris*) was the nearest species recorded to the site, at 0.144km west from the proposed development boundary. Please see **Appendix I** for full results.

4.4 Bat Survey Results

4.4.1 Pre-existing Records

There were nine records for bat species identified by HBIC, the nearest being Natterer's (*Myotis nattereri*) approximately 0.164km northwest. Barbastelles (*Barbastella barbastellus*) (2 records) were also identified within 2km of the site boundary.

4.4.2 Preliminary Roost Assessment (buildings)

A total of one dwelling and nine outbuildings were present on site and have been subsequently numbered (**Fig 14**). The results of the preliminary roost assessment undertaken covering the buildings on site is provided within **Table 3**.

Figure 14. One dwelling and 9 outbuildings on site with their associated numbers.



4.4.3 Preliminary Roost Assessment (trees)

All scattered trees proposed for removal within the proposed development site boundary are considered to have smooth bark with no PRFs identified.

Table 3. Bat Potential Roosting Feature (PRF) assessment of the buildings on site.

Building number	Figure	Description of Construction	PRFs / Evidence of Occupation	Assessed Roost Potential
1	Figure 15. View of the from the western aspect (front) of the dwelling, showing numerous lifted and missing tiles (August 2022). 	Single story derelict brick building with pitched (clay) interlocking tiled roof, with two lower dormer windows with bitumen felt hanging tiles (Fig 17). A conservatory is present to the northwest of the dwelling. It is noted to be very well sealed. NB: The dwelling has been boarded up, providing no internal access during the PEA. On the updated visit in August 2022, the building was found to be in a very poor state of repair with much of the roof missing. The roost locations were still largely intact.	Multiple raised, hanging, and missing roof tiles. Around the chimney to the west of the dwelling are gaps (including gaps at the base), which appear to be largely superficial. However, they may still provide internal access. The soffit has fallen down on the north-western and south-eastern aspects, which provides direct access into the internals.	Dwelling: High potential Later confirmed to support Common and Soprano Pipistrelle summer day roosts in hanging tiles to the rear of the building.
2	Figure 16. North-western aspect of the pigsty (August 2022). 	Single story pigsty with a corrugated asbestos roof (Fig 19). This building was found to be heavily dilapidated in August 2022.	It is very exposed, with direct internal access, as well as gaps in the roof. NB: A Swallow nest was identified within this building in November 2020.	Negligible potential

3	Figure 17. North-eastern aspect of the derelict warehouse (August 2022). 	Single story breeze-block derelict warehouse with part of the corrugated asbestos roof remaining (Fig 20). This building was found to be heavily dilapidated in August 2022.	Very exposed and open as over half of the roof having been burned down.	Negligible potential
4	Figure 18. Longer section of the stables / storage unit (August 2022).  Figure 19. Shorter section of the stables / storage unit (August 2022). 	Derelict stables / storage sheds to the southwest area of the site. Buildings have an L-shaped layout with the longer section comprised of timber-clad sheds (Fig 18) and the short section consisting of breeze-block stables (Fig 19); both sections have corrugated tin roofing. Internally there is a lot of clutter at ground level.	Some areas of the stables / storage unit are more sheltered and direct internal access is present. Despite this, no PRFs were identified.	Negligible potential

5	Figure 20. Internal view of the storage unit (August, 2022). 	Storage unit constructed of breeze-blocks and corrugated tin roof (Fig 20). This building is constantly open.	No PRFs were identified.	Negligible potential
6	Figure 21. Storage unit (August, 2022). 	Storage unit constructed of brick with a flat corrugated tin roof (Fig 21).	No PRFS identified.	Negligible potential

7	Figure 22. Internal view of the storage unit (August, 2022). 	Storage unit with largely only the metal framework remaining (Fig 22). A section of the timber cladding still remains, though the building is very exposed.	Very exposed and open as predominantly only the frame left.	Negligible potential
8	Figure 23. External and internal view of the open storage 'barn'. 	Open storage 'barn', constructed with a timber frame and corrugated metal roof. Walls are constructed of part metal, part wood (Fig 23). Part of the building has collapsed at the far end.	No PRFs identified.	Negligible potential
9	Figure 24. Static caravan that was erected after November 2022 (August, 2022). 	Closed and unoccupied metal static caravan that had been erected between the November 2020 and August 2022 walkover surveys.	No PRFs identified.	Negligible potential

10	Figure 25. Second static caravan that was erected after November 2022 (August, 2022). 	Occupied metal static caravan that had been erected between the November 2020 and August 2022 walkover surveys.	No PRFs identified.	<i>Negligible potential.</i>
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4.4.4 Emergence / Re-entry Surveys

The results of the bat emergence survey along with other relevant information of survey conditions are provided in **Tables 4** and 5 below.

Table 4. Relevant information on survey conditions recorded.

Date	Start Temp (°C)	End Temp (°C)	Cloud Cover (%)	Wind (beaufort scale)	Sunset / sunrise Time	Start Time	Finish Time	Additional Information	Building(s) covered
03/06/2021	16	14	50	1	21:12	20:57	22:42	Dry (rain at end of survey)	1,2,4 and 6
22/06/2021	12	12	10	1	21:23	21:08	22:53	Dry	1
08/07/2021	15	15	95	0	05:01	03:31	05:16	Dry	1

Table 5. Results from dusk emergence survey on the buildings at Moorlands Farm. HNS = Heard Not Seen.

Survey Date / buildings covered	Recorded Bat Roost(s)	Bat Activity on Site		
03/06/2021 Building 1, 2, 4 and 6	6 Common Pipistrelle and 1 Soprano Pipistrelle Emergences (Building 1 - main dwelling)	Species	First Pass	Last Pass
		Common Pipistrelle	20:58	22:42
		Soprano Pipistrelle	21:04	22:36
		Noctule	22:10	22:17
		<u>Summary:</u>		
		Activity during this survey was considered to be moderate with low numbers of bats constantly foraging around the main dwelling for the entire survey, as well as a number of emergences from the main dwelling. Activity levels around the other areas of the site was however significantly lower with only occasional bat passes recorded. Species diversity was low with only 3 species recorded. The first species recorded was Common Pipistrelle (<i>Pipistrellus pipistrellus</i>) which was first recorded at 20:58 emerging from the dormer window on the north western facing aspect of the dwelling (Fig 26 and 27). A second Common Pipistrelle was then recorded emerging from this same location at 21:00. Between 21:02 and 21:05 a further 4 Common Pipistrelles emerged from the main dwelling –		

		this time from the dormer window on the south east facing aspect (Fig 26 and 28). Following this low numbers (max 3 at a time) of Common Pipistrelle were recorded constantly foraging around the main dwelling until the end of the survey. Additionally some territorial behaviour between one Common Pipistrelle and one Soprano Pipistrelle was recorded for much of the survey – which resulted in both bats becoming grounded and fighting for about 30 seconds before flying off again. The second species recorded was Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>) which was first recorded at 21:04 emerging from the same location on the south eastern aspect of the main dwelling (Fig 26 and 28). Following this, the Soprano Pipistrelle and one of the Common Pipistrelles were observed exhibiting territorial behaviour until 22:36. As previously mentioned at one stage they were observed fighting each other on the ground, after they both fell whilst fighting mid-air. No other Soprano Pipistrelles were recorded during this survey. The final species recorded was Noctule (<i>Nyctalus noctula</i>) which was first recorded commuting over the site at 22:10 as HNS. The only other Noctule was recorded at 22:17 and was also HNS.		
22/06/2021	1 Common Pipistrelle emergence	Species	First Pass	Last Pass
		Common Pipistrelle	21:51	22:36
		Serotine	22:15	22:15
		<u>Summary:</u> Activity during this survey was considered to be low and limited to individual bats commuting / occasionally foraging (with most activity confined to the east of the main dwelling. Species diversity was again low with only 2 species recorded. The first species recorded was Common Pipistrelle which was recorded emerging from the south eastern aspect of the main dwelling at 21:51 from the hanging tiles of the dormer window (Fig 26 and 28). Following this Common Pipistrelle were recorded occasionally foraging and occasionally commuting past the dwelling, with the last pass recorded at 22:36. The only other species recorded was a single Serotine (<i>Eptesicus serotinus</i>) which was HNS to the west of the dwelling at 22:15.		
08/07/2021	1 Common Pipistrelle re-entry	Species	First Pass	Last Pass
		Common Pipistrelle	03:48	04:42
		<i>Myotis spp</i>	03:54	03:54
		<i>Plecotus spp</i>	04:10	04:10

		Noctule	04:23	04:23
		<u>Summary:</u> Activity during this survey was considered to be low and restricted to occasional brief foraging / occasional commuting individual bats. Species diversity was moderate during this survey with a total of 4 species recorded. The first species recorded was Common Pipistrelle which was first recorded as HNS to the east of the dwelling at 03:48. Following this, until 04:26, occasional Common Pipistrelle foraging and occasional commuting was recorded around the dwelling, the majority of which was to the east of the dwelling. At 04:42 a Common Pipistrelle was then recorded returning to roost under than hanging tiles of the dormer window on the south east aspect of the main dwelling. The second species recorded was a single <i>Myotis spp</i> which was HNS to the east of the dwelling commuting along the treeline at 03:54. The third species recorded was a single <i>Plecotus spp</i> which was recorded as HNS to the east of the main dwelling, again believed to the commuting along the treeline at 04:10. The final species recorded during this survey was a single Noctule which was recorded as HNS at 04:23 to the west of the main dwelling.		

Figure 26. Approximate locations of the Common Pipistrelle and Soprano roost location (orange dot) and Common Pipistrelle roost locations (red dot) during the bat surveys. The numbers refer to which survey the bats were recorded.



Figure 27. Approximate locations of 2 x Common Pipistrelle emergence (Red dot) on the north west facing aspect during the first survey.



Figure 28. Approximate locations of individual Common Pipistrelle emergences (Red dot) and 4 Common Pipistrelle and 1 Soprano Pipistrelle (orange dot) on the south east facing aspect of the dwelling.



4.5 Badgers

4.5.1 Pre-existing Records

There were nine records for Badgers identified by HBIC, the nearest being approximately 0.699km north.

4.5.2 Site Survey

During the PEA, no evidence of resident Badgers were noted. Owing to suitable habitats for Badgers on site (unmanaged grassland and scrub), it is considered they provide **moderate suitability** for Badgers at **site level**.

4.6 Reptiles

4.6.1 Pre-existing Records

There were records of Slow-worm (*Anguis fragilis*), Grass Snake (*Natrix helvetica*) and Common Lizard (*Zootoca vivipara*) identified by HBIC. The nearest is Grass Snake, at approximately 0.382km east.

4.6.2 Survey Results

The results of the reptile presence / likely absence survey are presented below in **Table 6** and **Fig 29** with the survey refugia distribution provided in **Fig 2**.

Table 6. Reptile Survey Results. AF = Adult Female, AM = Adult Male, SA = Sub-adult, Juv = Juvenile, Yr = Yearling, GS = Grass Snake

Survey No	Date	Time	Air Temp (°C)	Weather conditions	Grass Snakes	Total ²
1	31/08/2021	15:50	19	Still, cloudy, dry	1 A	1 GS
2	03/09/2021	11:50	20	Still, cloudy, dry	1 A 1 SA	1 GS
3	07/09/2021	08:00	17	Still, sunny, dry		
4	09/09/2021	10:50	19	Breezy, partial cloud, dry	1 A 1 SA	1 GS
5	15/09/2021	10:25	17	Still, cloudy, dry		
6	17/09/2021	11:30	18	Still, cloudy, dry	1 AF 1 AM	1 GS
7	21/09/2021	09:40	13.5	Still, partial cloud, dry		
8	23/09/2021	12:20	19	Breezy, cloudy, dry		

² Only including adult individuals

Figure 29. Locations of where the grass snakes (orange circles) were found within the site (Google Maps, 2021).



4.7 Great Crested Newts

4.7.1 Pre-existing Records

HBIC did not return any records of GCN presence from within the 2km search radius.

4.7.2 On Site Suitability

Like with reptiles, the structural heterogeneity provided by the different sward heights of the grassland and shelter provided by scrubs is considered suitable to support terrestrial GCN.

4.7.3 Waterbodies Within 500m

A total of three waterbodies were identified on-site and seven waterbodies within 500m of the site boundary were shown on available OS maps within a 500m radius from the site (excluding three which are also on site) (**Fig 32**). Two ponds were identified within contiguous habitat and were also subject to a HIS assessment, as outlined below. The locations of these are detailed within figure

Pond 4 is located adjacent (outside of) the proposed development boundary along the northeast side of the site (**Fig 30**).

Figure 30. Pond 4, adjacent to the northeast boundary of the site (November 2020).



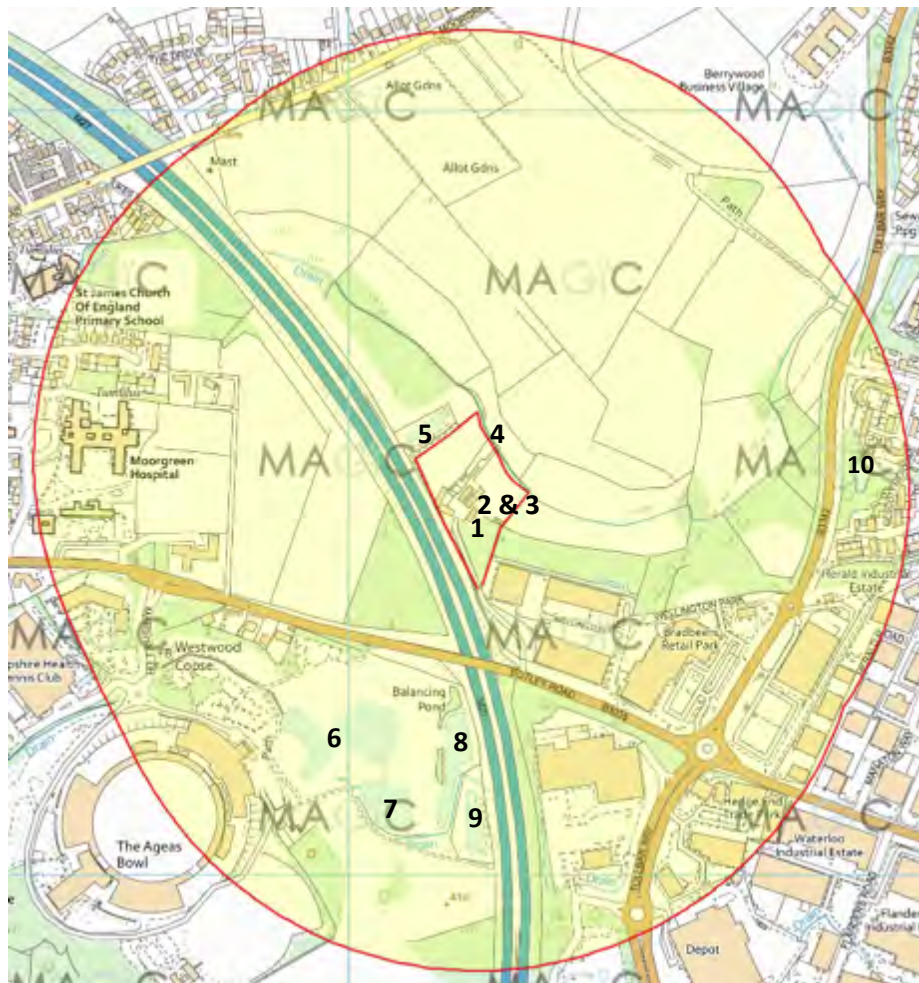
Pond 5 is located close to, but outside of the proposed development boundary along the northwest part of the site (**Fig 31**).

Figure 31. Pond 5, close to the northwest boundary (November 2020).



It is considered there will be **negligible** impact on ponds 6, 7, 8, 9 and 10 owing to the major barriers (M27 and Tollbar Way) present between the site and those ponds.

Figure 32. Location of ponds within 500m of the site. The inner red outline indicates the approximate site location, and the circle indicates the 500m buffer around the site (Magic Maps, 2021).



The ponds on-site achieved the following HSI scores:

Pond Number	HSI Score	Suitability
1	0.57	Below Average
2	0.50	Below Average
3	0.58	Below Average
4	0.59	Below Average
5	0.39	Poor

4.8 Hazel Dormouse

4.8.1 Pre-existing Records

There were seven records for Hazel Dormice identified by HBIC, the nearest being approximately 0.98km south.

4.8.2 Survey Results

No Dormouse nests or individuals were observed during the surveys, however several wood mouse (*Apodemus sylvaticus*) nests were found during September and October surveys, locations are noted in **Fig 33**.

Figure 33. Locations of where the wood mouse nests (yellow circles) were found within the site (Google Maps, 2021).



4.9 Nesting and Breeding Birds

4.9.1 Pre-existing Records

HBIC have returned records for a variety of different bird species including a number of NERC S41 listed species and Birds of Conservation Concern (BoCC).

4.9.2 On Site Suitability

During the PEA, a Swallow nest was identified within building number 2. Furthermore, it is considered the habitats on site, particularly scrub and trees, provide **moderate suitability** for a variety of nesting and breeding birds.

The habitats on site also provide ample opportunities for foraging birds from the wider landscape.

4.10 Other species

4.10.1 Pre-existing Records

There were 47 records for Hedgehogs identified by HBIC, the nearest being approximately 0.424km north.

4.10.2 On Site Suitability

Hedgehogs may occasionally use the site for commuting and foraging purposes.

5.0 EVALUATION

5.1 Desk Based Search

5.1.1 Protected Sites

Moorgreen Meadows SSSI and Wildern LNR are both of ***national value***. The SINC's are of ***county value***.

5.1.2 Priority Habitat

The priority habitat on site is of ***national value***.

5.1.3 Protected Species

In line with the findings of the data search it is considered that the site supports habitats suitable to support foraging, commuting and roosting bats, nesting birds, reptiles. Bats, Grass Snakes and Swallows have been confirmed on-site utilising suitable habitat.

5.2 Habitats

Grassland: The areas of neutral and modified grassland are considered to have the potential to support foraging bats and support confirmed presence of reptiles. As a result, it is of ***local value***.

Scrub: This provides optimum habitat for nesting birds and is also likely to be utilised by foraging and commuting bats and small mammals. As a result, it is at least of ***local value***.

Trees/Tree lines: The trees on site provides nesting bird opportunities and are used by foraging and commuting bats. It is therefore considered to be of ***local value***.

Hardstanding: This aspect of the site is considered to be ***negligible value***.

Buildings: The dwelling supports roosting Common and Soprano Pipistrelle bats and is therefore considered to be of ***local value***. The outbuildings are of ***local value*** due to their potential to support nesting Swallows.

5.3 Badger Survey

No evidence of active Badger setts were recorded during the survey effort. The main body of the site provides opportunities for foraging and commuting Badgers. The site is considered to have potential to support foraging and/or commuting Badgers and/or Hedgehogs (*Erinaceus europaeus*). It is therefore considered to be of ***site value***.

5.4 Great Crested Newts

As there are no records of GCN within 2km of the site and the surrounding ponds hold poor-below average suitability for Great Crested Newts, the site is considered to hold ***negligible*** suitability for GCN.

5.5 Bats

5.5.1 Foraging and commuting

Overall, the levels of foraging and commuting bats recorded on site during the surveys was low-moderate and almost entirely restricted common species (Common Pipistrelle, Soprano Pipistrelle)

with occasional activity from other common species and rarer bats (*Myotis* spp, *Plecotus* spp, Noctule and Serotine). Given the nature of the existing site, the close proximity of the motorway and the nature of the proposed development, it is considered there will only be minor impacts to foraging and commuting bats.

5.5.2 Roosting

Based on the results of the preliminary roost assessment and follow up emergence surveys, the main dwelling (building 1) has been classified as supporting a Common Pipistrelle and Soprano Pipistrelle Day Roost, and building 2, 4 and 6 are all considered to have a likely absence of roosting bats. The proposed works will result in the permanent loss of these day roosts due to the proposed demolition of the dwelling.

5.5.3 Site Status Assessment

In accordance with the *Bat Mitigation Guidelines* (Mitchell – Jones, 2004), the Common Pipistrelle and Soprano Pipistrelle day roosts present within the main dwelling are considered to be of **LOW CONSERVATION SIGNIFICANCE** and therefore of **LOCAL SIGNIFICANCE** using the IEEM valuation criteria for bat roosts (Wray et al., 2010).

5.5.4 Implications

Due to the presence of a bat roosts within the main dwelling, any works to the building that will result in damage or disturbance to the roosts (i.e. roofing works / works to the dormer window) would likely constitute an offence under the Conservation of Habitats & Species Regulations (2010). In order for works that may result in such an offence (including demolition, modification of the building and repair) to legally take place, a European Protected Species (EPS) licence will be required. To inform an EPSL, section 6.2 details appropriate mitigation and compensation measures.

5.6 Dormice

Based on the survey results, it is considered unlikely Dormice are currently using the site, however, due to the number and distance of nearby records, and the connectivity of on-site habitats to the wider environ, there is the potential for future dispersal of Dormice onto the site.

5.7 Reptiles

The reptile surveys indicated that a **medium** population (max count of 2 adults in one survey) of Grass Snakes (*Natrix natrix*) are present on-site. All observations were noted on the eastern side as shown in **Fig 8**. No other reptile species were observed during these surveys. In addition to the one adult noted, one sub-adult was also noted within this area, indicating an established population within the local vicinity (most likely within the SSSI to the east). With this considered, the site is considered to be of **local** value for Grass Snakes. The site is not considered to be a key reptile site (Froglife, 1999).

5.8 Nesting and Breeding Birds

Nesting Swallows have been identified utilising one of the outbuildings. In addition, suitable nesting bird habitat has been identified in the form of scattered trees, scrub and tree lines. The site is considered to be of **site value** for nesting and breeding birds.

6.0 ZONE OF INFLUENCE

The Zone of Influence is defined by CIEEM as being the areas / resources that may be affected by the biophysical changes caused by activities. The Zone of Influence is based on the sensitivity of the receptor to any biophysical changes which could occur and the extent to which those changes could occur.

6.1 Construction Phase

6.1.1 Change in Land Use

The change of use of the site will result in the physical structure of the present site being altered by the proposed development. Site preparation activities will include earthworks and earth stripping associated with a phased construction. Therefore, the zone of influence is predicted to extend across the development footprint. All protected species and habitats within the development footprint and along the boundary have the potential to be disturbed.

6.1.2 Noise Pollution

Noise disturbance occurs as a result of plant operation, traffic movements and movements of site personnel associated with the continued extraction, crushing, screening and tipping within the application area.

When ground cover or normal unpacked earth is present between the source and receptor, the ground becomes absorptive to noise energy and is called a soft site. This can reduce in-air noise over distance. As these conditions are present on site is considered that the noise from construction will not travel far past the development boundary. This will be aided by the presence of screening vegetation around the boundary of the site. The retention of perimeter vegetation and reinforcing planting of hedgerows will reduce noise levels outside of the development footprint.

No sensitive receptors for noise have been identified within 2km of the site, therefore, the Zol is considered to be the application site itself.

6.1.3 Air Pollution

Particulates associated with the construction phase of this development will come from three main sources. The vehicles on site, from exhaust emissions, the contact of tyres on the road surface or dust blowing from materials carried via vehicles, stripping of topsoil/vegetation and excavation of footings for the new properties.

The zone of influence for air pollution, particularly dust, will depend on the time of year/weather condition within which works are carried out. For example, in dry conditions there may be dust generated by activities taking place during the construction phase, where as in wet weather less dust will be generated. It is also dependant on the wind speed at the time of the activity as this determines how far the air pollution will be transported and indeed the direction.

Fugitive dust from development sites is typically deposited within 100-200m of the source; the greatest proportion of which comprise larger particles (greater than 30 microns) is deposited within 100m (Greater London Authority, 2006). Therefore, the zone of influence for

air pollution during construction will be the development footprint itself with a 200 meter buffer.

6.1.4 Water Pollution

The impact area is related to releases of pollutants to a water body will depend on the type of water body (e.g. stream, river or lake), the volume and flow of that water body, the nature of the pollutant and the chemical characteristics of the water body. Due to the close proximity of Portsmouth Harbour the water to the north and east is considered to fall within the zone of impact.

6.2 Operational Phase

The zone of influence associated with the operational phase is extended beyond the site boundaries due to the nature of the development resulting in an increase in human activity and disturbance in the direct vicinity and further afield.

6.2.1 Light Pollution

This impact of lighting will be confined within the development footprint itself. There is the possibility of light spilling into adjacent land however by retaining and enhancing existing vegetation it is considered this will be minimal. Therefore, the zone of influence will encompass the development footprint with a one meter buffer along the outside of the boundary.

6.2.2 Noise

The site is currently screened by vegetation. The retention of this and additional planting will continue to provide screening for wildlife populations. As there are already levels of noise associated with nearby road networks it is not considered noise generation will be significantly increased. Similarly, as the noise associated with this development will not be continuous and will not reach high levels, it is considered unlikely that the zone of influence for this development in operation will extend 10m from development boundary.

7.0 LIKELY ECOLOGICAL IMPACTS IN ABSENCE OF MITIGATION

7.1 Introduction

The CIEEM guidelines (CIEEM 2018) require that the potential impacts of the proposals should be considered in absence of mitigation. In order for a significant adverse effect to occur, the feature being affected must be at least of local value. However, in some cases, features of less than local value may be protected by legislation and/or policy and these are also considered within the assessment. Although significant effects may be identified at this stage of the assessment, it is often possible to provide appropriate mitigation.

7.2 Site Preparation and Construction

7.2.1 Impacts to Designated Sites

Due to the close proximity of Moorgreen Meadows SSSI (along the sites S, E and N boundaries), there is potential for it to be significantly impacted through dust deposition and surface run-off/drainage. Therefore, there will be a **likely significant negative impact** at a **national level**.

Wildern LNR falls beyond the ZoI for air pollution and aquatic pollution impacts, therefore, there will be a likely **negligible impact**.

7.2.2 Impacts to Habitats

The development will result in the loss of unmanaged grassland, scrub and some scattered trees, with the majority of these habitats considered to be of a **local level** of significance. The development will also be taking place adjacent to mature hedgerows and tree lines which could be harmed through dust deposition and root zone compaction (with these features considered to be of **local** value). **Therefore, there will be a likely significant adverse impact upon habitats of value at the local level.**

7.2.3 Impacts to Wildlife

There were a range of suitable habitats present on site noted which could be used by breeding and nesting birds with a diverse range of local records also returned by HBIC for within a 2km radius of the site. In addition, confirmed presence of Swallows was noted in building 2. Therefore, there will be a likely adverse impact if clearance works are undertaken without adequate mitigation.

Suitable habitat for foraging and commuting bats was also identified. Consequently, construction works could result in the disturbance of foraging habitat and commuting routes. In the absence of mitigation, this is considered to have a likely **moderate adverse impact** at the local level.

Should the main dwelling be demolished in the absence of mitigation both Common and Soprano Pipistrelle roosts would be permanently lost and both species would likely be disturbed, harmed or even killed. This would result in a **certain adverse impact** and the **Local Level**.

Suitable habitat for foraging and commuting mammals, including Badger and Hedgehogs was identified. Consequently, any open excavations at night could result in the entrapment of any

foraging and commuting small mammals, this has the potential to result in **adverse impacts** for these animals.

A moderate population of Grass Snakes has been found within the grassland habitats on-site. The destruction and disturbance of these habitats during the construction phase, if reptiles are present, will result in a **likely adverse impact at the local level**.

7.3 Site Operation

7.3.1 Impacts to Wildlife

The development is taking place in an area within which night time lighting is minimal and therefore any additional lighting associated with the development could result in disturbance to bats along with any other nocturnal wildlife present. Therefore, an **adverse impact is likely** on local foraging and commuting bats.

8.0 MITIGATION AND COMPENSATION

8.1 Introduction

Mitigation refers to measures that can be undertaken to avoid or reduce ecological impacts. Compensation refers to measures taken in order to offset potential significant impacts.

8.2 Bats

8.2.1 Mitigation

8.2.1.1 EPS Licence

All works that affect bat roosts carried out on building 1 (the main dwelling at Moorlands Farm) (as per **Fig 27 – 28**) must take place under an EPSL obtained from Natural England and the destruction of the roosts and capture of bats (if required) will need to be carried out under the supervision of a licenced Ecologist. All works would be detailed within the EPSL Method Statement required as part of the licence application.

8.2.1.2 Timing

It is recommended that works avoid the hibernation period (November – February or when temperatures have not dropped below 8°C over four consecutive days and nights), when bats are in a torpid state and therefore more vulnerable (as per Bat Mitigation Guidelines). According to the Bat Mitigation Guidelines, there are no particular timing constraints imposed upon low conservation significance roosts during the summer months (March- October). Works will take place in suitable weather conditions as defined by best practice guidance (Mitchell-Jones et al. 2004).

8.2.1.3 Supervision

Prior to any works getting underway the licensed bat worker will give a Tool Box talk which will detail best practice methods of sensitive stripping/removal of roofing tiles/materials, sensitive demolition of the building once the areas surrounding the roosts have been stripped and identifying signs of bats. Personnel will be educated on signs of bats and that, in the unlikely event a bat is found whilst the licensed ecologist is not on site, that all works should stop immediately until the licensee returns to site.

The licensed bat worker will then assist contractors with the removal of construction materials surrounding the roosts. Once this has been completed the building will be sensitively demolished.

8.2.1.4 Capture (if required)

If during the sensitive removal of construction materials bats are discovered, the supervising ecologist will place the individuals into a holding bag (a soft cloth bag with closure-strings and with seams on the outside (Mitchell-Jones and McLeish, 2004) to ensure the bat keeps calm and will not take flight during daylight hours. They will then immediately transport the bat to one of the mitigating bat boxes where the bat will be released and left undisturbed. During this time, the licenced bat worker will be wearing appropriate bat handling gloves to ensure the bat does not come to any harm. The licenced bat worker will have ample experience in handling a variety of bats and is confident in doing so.

8.2.1.5 Bat boxes

Prior to any works getting underway two 2F (general purpose) bat boxes (or similar for Pipistrelles) will be erected on to suitable trees on the eastern boundary of the site. This box is designed as a suitable alternative for small bat roosts, such as Common and Soprano Pipistrelles day roosts. The hollow nature of the box also makes it suitable for a wider range of other species also noted using the site (including Noctules)³. The bat box maintains a stable temperature inside the box and is painted black to absorb warmth.

The bat boxes are manufactured from long-lasting Woodcrete which will not rot, leak, crack or warp, and will last for at least 20 - 25 years, making it suitable for long-term mitigation projects. It also provides a rough surface for bats to cling on to and climb. This is a proportionate approach to mitigating for the loss of low-level roosts.

English Nature (2004) state that 'where roosts of low conservation significance are to be lost to development, bat boxes provide an appropriate form of mitigation, either alone or, preferably, in combination with the provision of roosts in buildings'.

8.2.1.6 Roof underlining

To cover for the eventuality that all the new buildings may become suitable for bats in the future, where roofing felt is used, non fibrous short woven bitumen roofing must be utilised as opposed to Breathable Roof Membrane (BRM) or other fibrous materials for all roofing works, as there is considerable evidence to suggest that such material poses a threat to bats occupying a structure due to entanglement in the fibres (Natural England, 2015).

8.2.1.7 Compensation

Given the low scale of the proposed works, the most appropriate compensation would be to leave the mitigation bat boxes *in situ* for perpetuity in addition to the bat brick that will be incorporated into units F and G.

The newly renovated farmhouse building will also incorporate four bat tiles on the southern elevation to allow access back into this building once renovation works have been completed. The top 'tunnel' tile offers the bat an 18mm high x 165mm long tunnel to an entrance hole in the under tiles. This allows the bat to crawl into the roost area. The two tiles beneath the 'tunnel' tile have small cutaway sections to facilitate access for the bat.

8.2.1.8 Monitoring and Maintenance

The *Bat Mitigation Guidelines* do not recommend further conditions in relation to the post development monitoring of bat roosts of low conservation significance. However, a compliance check will be carried out to ensure all agreed mitigation and compensation techniques have been implemented.

8.3 Reptiles

The site will be subject to a reptile capture to prevent reptiles being negatively impacted by the proposals. As a result, the following steps will be undertaken:

8.3.1 Fencing

Semi-permanent exclusion fencing will be installed around the perimeter of the development

to both facilitate the reptile capture to prevent reptiles in the field boundaries from re-colonising the grassland (**Fig 34**). This provides a division between the areas of retained and protected vegetation and the 'working' areas i.e. those areas where humans and machinery will disturb the ground and also will prevent reptiles from passively passing through the site from surrounding favourable habitat. The fencing will remain in place until all works are completed. Any breaches/damaged fence will be repaired and/or replaced as quickly as possible, at the cost of the contractors responsible.

Figure 34. Proposed approximate reptile fencing plan. Reptile fencing to separate the reptile receptor from the development during construction (blue dashed line) (Radley House Partnership, 2022).



8.3.2 Donor area set-up

Initial habitat manipulation will be implemented across the site. The Bramble and grass level will be cut to reduce the sward height to 10cm (if possible, this should be completed between September- February to avoid nesting bird season). This will increase the reptile's reliance on the artificial refugia to enhance the capture effort. (This may need to be repeated if the grass level begins to increase).

Artificial refugia will be distributed throughout the main body of the site. The refugia used will

be a mixture of bitumen roofing felt and corrugated metal. The density will be increased, if necessary, to facilitate the capturing process, in an attempt to reduce the number of capture days required.

8.3.3 Capture

Timing

The optimum period for capture of reptiles is April to June and September, however, it is possible to capture reptiles outside of this period providing weather conditions are suitable. By ensuring that all reptiles are translocated by the end of September, it will allow sufficient time for reptiles to find suitable hibernation sites within the receptor site.

Catching

Suitably qualified ecologists, with experience in reptile capture, will carry out the trapping of reptiles during the active reptile season on days where reptiles were likely to be found (i.e. between 10°C and 20°C with little or no wind or rain). Reptiles will be captured by hand from beneath the artificial refugia and placed into a suitable container. All captured reptiles will be released on to the receptor site immediately.

Capture effort

The HGBI guidelines (1998) suggest that for 'medium' populations a minimum of 70 days capture is undertaken (**Table 5**). However, as a large amount of the area where the Grass Snakes were found is being retained, with the use of habitat manipulation increased density in refugia, it is considered likely the capture may be completed in a much shorter timeframe (30 days) although this can be reviewed during the capture works. Artificial refugia will be distributed across the site at a minimum density of 50/ha. The capture effort will not be deemed completed until five consecutive negative days are recorded.

Table 7. The minimum capture effort for common reptile species based on HGBI (1998). The figures relevant to this scheme are emboldened and italicised.

Species	Population Size (adult density)	Refugia Density / ha	Minimum No of Trapping Days in Good Weather
Grass Snake	High (>4 / ha)	100	All suitable days between March and September (min 90 suitable days)
	<i>Medium (2-4 / ha)</i>	<i>100</i>	<i>All suitable days between March and September (min 70 suitable days)</i>
	Low (< 2 / ha)	50	60 Suitable days

Suitably qualified ecologists, with experience in reptile capture will undertake the capture between April-October. Reptiles will be captured by hand from beneath the artificial refugia and placed into a suitable container during suitable conditions (i.e. between 10°C and 20°C with little or no wind or rain). All captured reptiles will be released into the receptor area immediately. By ensuring that all reptiles are translocated by the end of October it will allow

sufficient time for reptiles to find suitable hibernation sites within the receptor site.

8.3.4 On-site Reptile Receptor

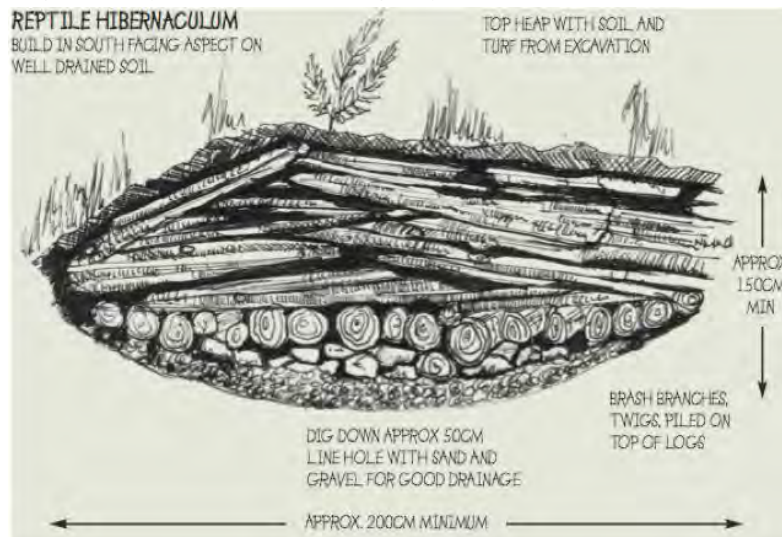
Receptor Site

Wherever possible, reptiles should be retained on site, or released immediately adjacent to the site (English Nature, 2004). This will be the case for this development as the Moorgreen Meadows SSSI is immediately adjacent to the east of the site (and therefore is likely to support Grass Snakes from the same population as those found on-site). The SSSI is designated for supporting 14.06 ha of neutral meadows of exceptional scientific importance for its population of Marsh Orchids (*Dactylorhiza* spp), and Alder (*Alnus* spp) woodland mosaic. In addition, a small tributary of the River Hamble flows past the south west of the designed site (separating the development site from the SSSI). It is recommended the centre of the SSSI (closest to the eastern boundary of the development site) is enhanced for reptiles as per the below recommendations.

Receptor Site Enhancement

Two wood-based hibernacula will be constructed within the receptor area to enhance the carrying capacity of the area. It is recommended these are sited in a sunny position within suitable habitat away from the public footpaths and avoiding any wetter areas. This will provide shelter and hibernation opportunities as well as providing a significant habitat resource for invertebrates (a food resource for reptiles). **Figure 35** illustrates hibernacula design that follows best practice guidelines (HART, 2009). The size of the hibernaculum will be at least 5m².

Figure 35. Reptile hibernaculum design as provided in HART (2009).



It is also recommended that an ecological enhancements report for the ecology area should be requested as an appropriately worded condition with the granted planning permission. This report should detail further enhancement measures to improve the suitability of the meadow for reptiles, and to contribute towards a biodiversity net gain to replace lost grassland habitats on-site as a result of the proposals.

8.3.5 Funding and Safeguard

Habitat monitoring and subsequent management at the receptor site must be undertaken as required to maintain its suitability to support reptiles. The management and on-going monitoring of the receptor site will be funded by the developer for a period of no less than five years following the completion of the development. The responsibility will eventually be passed onto the relevant management company.

Management will include the repair or replacement of damaged hibernacula and the maintenance of habitats within the receptor to ensure the habitats remain suitable for reptiles.

8.4 Updating Badger Walkover

Due the mobility of Badgers, prior to construction works, an updating Badger walkover is required immediately prior to construction works commencing to identify if any new setts have established on site.

8.5 Avoidance to Nesting Birds

In order to avoid disturbance / harm to nesting birds or damage to their nests, all construction works (i.e. tree, shrub and scrub removal), and the removal of the outbuildings, will be undertaken outside of the bird nesting season (bird nesting season is typically between March – August, dependent on weather). If this is not possible, any potential nesting sites must be checked by a suitably qualified Ecologist. If an active nest is identified a 5m buffer will be established, within which no works will be able to take place until the Ecologist has confirmed the fledglings have left the area of impact.

8.6 Protective Fencing

Tree protective fencing will protect boundary vegetation from direct impact and from severance or asphyxiation of the roots. Fences must be installed at the distance of the branch spread away from the tree trunk (British Standard 5837:2012 Trees in relation to construction) at a distance half the height of the tree and be of chestnut paling or of another similarly robust style of fencing. No vehicles will enter the protective ring fencing and no materials will be stored within their circumference. All protective fencing must be in place prior to any construction machinery arriving on site, before any works on site get underway, and will remain in place until all work is completed. This will minimise the level of disturbance within the boundary vegetation during construction.

8.7 Lighting during the Construction Phase

In order to avoid any disturbance to bats (and other potential nocturnal wildlife) construction works should be limited to daylight hours and should not be undertaken 30 minutes prior to dusk through to dawn. All lighting should be sensitive to the use of the site by nocturnal wildlife, for example by including low-level downward-facing / hooded lights that are sensor-operated where possible.

8.8 Avoidance of Entrapment during the Construction Phase

During construction, any excavations on site should be covered nightly and/or include a suitable escape ramp for the protection of wildlife e.g. Hedgehogs (a suitable escape ramp

can be created using wooden planks placed at a 45-degree angle or provision of a sloping end wall). Any temporarily exposed open pipe systems should be covered.

8.9 CEMP

A CEMP will be produced and followed to mitigate for air and aquatic pollution to Moorgreen Meadows SSSI during the construction phase.

8.10 Operational Phase

8.10.1 Sensitive Lighting

A document (*Guidance Note 08/18 Bats and Artificial Lighting in the UK*) has recently been produced via a collaboration between the Institute of Lighting Professionals (ILP) and the Bat Conservation Trust (BCT), which outlines the latest recommendations to minimise the impacts of increased artificial lighting on bats. The key recommendations within this document have been outlined below and will be implemented with a view to ensuring light spill onto the new roosts and flight lines to the woodland are kept at or below 1 Lux.

‘Luminaires come in a myriad of different styles, applications and specifications which a lighting professional can help to select. The following should be considered when choosing luminaires:

- *All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used. LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.*
- *A warm white spectrum (ideally <2700Kelvin) should be adopted to reduce blue light component.*
- *Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012).*
- *Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.*
- *The use of specialist bollard or low-level downward directional luminaires to retain darkness above can be considered. However, this often comes at a cost of unacceptable glare, poor illumination efficiency, a high upward light component and poor facial recognition, and their use should only be as directed by the lighting professional.*
- *Column heights should be carefully considered to minimise light spill.*
- *Only luminaires with an upward light ratio of 0% and with good optical control should be used – See ILP Guidance for the Reduction of Obtrusive Light.*
- *Luminaires should always be mounted on the horizontal, ie no upward tilt.*
- *Any external security lighting should be set on motion-sensors and short (1min) timers.*
- *As a last resort, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed (Fig 36).*
- *The use of low-level bollard lighting for the driveway leading to the house can also be considered where appropriate.*

Figure 36. (a) Shield ‘barn doors’ (b) cowl hood; (c) shield and; (d) external louvre Images from ILP (2011).



8.11 Ecological Enhancements

Enhancements will be implemented to increase the value of the site in comparison to the baseline, ensuring a net gain for biodiversity.

8.11.1 Native Tree and Shrub Planting

In line with the Chartered Institute of Ecology and Environmental Management (CIEEM) guidance (2012), any proposed planting on site must aim for a 70:30 ratio in favour of native species over non-natives and ornamentals. In addition, fruit bearing trees provide food sources for birds and small mammals during the autumn and winter and nest sites during the spring and summer.

The planting scheme has been developed to focus on native tree and scrub planting to maintain and improve connectivity throughout the site. Species incorporated into the design include Field Maple (*Acer campestre*), Hawthorn (*Crateagus monogyna*), Dogwood (*Cornus sanguinea*), Hazel, Common Privet (*Ligustrum vulgare*), Holly (*Ilex aquifolium*), Blackthorn (*Prunus spinosa*), Oak, Willow (*Salix* spp), Yew (*Taxus baccata*) and Guelder Rose (*Viburnum opulus*).

8.11.2 Neutral Grassland Planting

The ecology area, triangle to the south of the site and open space will be planted with diverse, native wildflower mixes and managed as wildflower meadows to improve opportunities for local invertebrates and compensated for areas of neutral grassland being lost to make way for the development. Further details of these should be included within a BEMP report secured by a suitably worded condition.

8.11.3 Creation of Priority Habitat

To compensate for the loss of priority habitat deciduous woodland on-site, new areas of deciduous woodland will be created within the ecology area and around the site peripheries. In addition, the SUDS will be planted with reedbeds to create new wetland opportunities for local birds. Traditional Orchard will also be created within the ecology area to provide a mix of habitats within the recreational space. When mature, fruit trees produce many veteran features that provide suitable roosting habitat for bats. In addition, the nectar-rich flowers, and fruit provides a protracted food source for local insects and birds.

8.11.4 Bat and Bird Bricks

To act as biodiversity enhancement, the new buildings will incorporate a total of 34 Swift bricks and 17 bat bricks.

The bat bricks used should be the Ibstock Bat Brick B as they are available in a variety of different brick colours and requires no maintenance (**Fig 36**). Both types of boxes should be positioned as close to the eaves as possible and away from windows and sources of artificial light.

Figure 37. The Ibstock bat brick 'B' that will be incorporated into the newly built units.



The 'CJ Wildlife swift maxi nesting box' with entrance via a CJ Wildlife 'Cambridge swift fullface brick' is recommended as it provides ideal nesting opportunities for Swifts and the fullface brick is available in different colours and can also be painted if necessary, to blend in with the surrounding brickwork. If this model is not suitable for the building specifications, an alternative swift box with internal floor space exceeding 400cm squared must be used. This feature should be installed at 6-7m above the ground, ensuring that there is unobstructed access for birds entering and leaving. The box should be installed under the eaves in shaded areas out of direct sunlight and away from windows.

8.11.5 Log Piles

Two log piles will be created within the retained southern triangle on-site. These will form ideal places of shelter for important species such as Hedgehogs, and a significant habitat resource for invertebrates, which in turn will benefit local foraging and commuting bird and bat species.

8.11.6 Hedgehog Home

As well as the log piles, three Hedgehog homes will also be incorporated into the wider landscaping of the development to enhance sheltering opportunities for local Hedgehogs (such as Igloo Hedgehog home or Hogitat Hedgehog house) (**Fig 38**). This will provide a rapidly declining species with a place to shelter/hibernate.

Figure 38. Igloo Hedgehog House (Amazon, 2020).



8.12 Biodiversity Net Gain

In accordance to assessed condition assessment completed of habitats during the walkover, the above enhancement recommendations, and the landscape plan produced by ACLA Ltd, calculations for the net gain to biodiversity completed in Defra Metric 3.1 has **achieved a net gain of 0.08% (or 0.01 habitat units) (Fig 39)**. In addition to this, there is a **net gain 419.11% of linear habitats** (with all hedgerows retained).

Figure 39. Screenshot taken from the Defra Metric 3.1 calculation headline results.

On-site baseline	Habitat units	12.93
	Hedgerow units	0.94
	River units	0.00
On-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	12.94
	Hedgerow units	4.88
	River units	0.00
On-site net % change (Including habitat retention, creation & enhancement)	Habitat units	0.08%
	Hedgerow units	419.11%
	River units	0.00%
Off-site baseline	Habitat units	0.00
	Hedgerow units	0.00
	River units	0.00
Off-site post-intervention (Including habitat retention, creation & enhancement)	Habitat units	0.00
	Hedgerow units	0.00
	River units	0.00
Total net unit change (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	0.01
	Hedgerow units	3.94
	River units	0.00
Total on-site net % change plus off-site surplus (including all on-site & off-site habitat retention, creation & enhancement)	Habitat units	0.08%
	Hedgerow units	419.11%
	River units	0.00%

The habitat net gain assessment of 0.08% takes into account the removal of mature trees that has already been undertaken to the south of the existing dwelling. This net gain, whilst small, still reflects the significant retained and new habitats that will be provided and that includes significant new tree and woodland planting. The new woodland trees will take some years to fully mature but the overall landscaping scheme will provide an positive contribution towards a gain for local biodiversity, both within the site and connected to its wider setting.

9.0 REFERENCES

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APPENDIX I – Data search for protected fauna

UK and EU protected species records within 2km of the site, within the previous ten years.

Name (common, scientific)	Most recent record	Closest Record Proximity to site (distance and direction)	Max count	Legal status
Amphibians and Reptiles				
Slow-worm, <i>Anguis fragilis</i>	2015	0.982km west	17	NERC s41 WACA s5s91(t)
Grass Snake, <i>Natrix helvetica</i>	2017	0.382km east	3	NERC s41 WACA s5s91(t)
Common Lizard, <i>Zootoca vivipara</i>	2019	1.296km southeast	8	NERC s41 WACA s5s91(t)
Bats				
Barbastelle, <i>Barbastella barbastellus</i>	2017	1.328km southwest	2	EU Hab 2np EU Hab 4 Hab Reg s2 IUCN GB VU NERC s41 WACA s5s94b WACA s5s94c CI
Serotine, <i>Eptesicus serotinus</i>	2019	0.982km west	10	EU Hab 4 Hab Reg s2 WACA s5s94b WACA s5s94c WACA s5s95a
Daubenton's, <i>Myotis daubentonii</i>	2018	1.82km north	1	EU Hab 4 Hab Reg s2 WACA s5s94b WACA s594c
Natterer's, <i>Myotis nattereri</i>	2012	0.164km northwest	1	EU Hab 4 Hab Reg s2 WACA s5s94b WACA s5s94c
Noctule, <i>Nyctalus noctula</i>	2019	0.982km west	15	EU Hab 4 Hab Reg s2 NERC s41 WACA s5s94b WACA s5s94c UK BAP
Nathusius's Pipistrelle, <i>Pipistrellus nathusii</i>	2018	1.114km northwest	1	EU Hab 4 Hab Reg s2 WACA s5s94b WACA s5s94c
Common Pipistrelle, <i>Pipistrellus pipistrellus</i>	2019	0.989km south	30	EU Hab 4 Hab Reg s2 WACA s5s94b

				WACA s5s94c UK BAP
Soprano Pipistrelle, <i>Pipistrellus pygmaeus</i>	2019	0.989km south	19	EU Hab 4 Hab Reg s2 NERC s41 WACA s5s94b WACA s5s94c UK BAP
Brown Long-eared, <i>Plecotus auritus</i>	2019	1.15km north	14	EU Hab 4 Hab Reg s2 NERC s41 WACA s5s94b WACA s5s94c UK BAP
Birds				
Lesser Redpoll, <i>Acanthis cabaret</i>	2018	1.365km north	80	BOCC Red NERC s41
Skylark, <i>Alauda arvensis</i>	2018	1.753km north	50	BOCC Red NERC s41
Tree Pipit, <i>Anthus trivialis</i>	2017	1.753km north	13	BOCC Red NERC s41
Hawfinch, <i>Coccothraustes coccothraustes</i>	2018	1.205km west	14	BOCC Red NERC s41 CI
Corncrake, <i>Crex crex</i>	2014	2.523km northwest	1	BOCC Red EU Bird 1 NERC s41 WACA s1p1
Cuckoo, <i>Cuculus canorus</i>	2018	1.4km north	16	BOCC Red NERC s41
Lesser Spotted Woodpecker, <i>Dendrocopos minor</i>	2013	1.804km southwest	7	BOCC Red
Merlin, <i>Falco columbarius</i>	2017	1.765km northwest	4	BOCC Red EU Bird 1 WACA s1p1
Pied Flycatcher, <i>Ficedula hypoleuca</i>	2017	0.99km north	10	BOCC Red CR
Herring Gull, <i>Larus argentatus</i>	2018	1.401km south	1582	BOCC Red CR
Lesser Black-backed Gull, <i>Larus fuscus</i>	2018	1.753km northwest	44	BOCC Red CR
Linnet, <i>Linaria cannabina</i>	2014	1.753km north	23	BOCC Red
Grasshopper Warbler, <i>Locustella naevia</i>	2017	2.115km northwest	5	BOCC Red NERC s41 CR
Grey Wagtail, <i>Motacilla cinerea</i>	2018	0.892km north	34	BOCC Red

Yellow Wagtail, <i>Motacilla flava</i>	2017	1.219km north	153	BOCC Red CR
Spotted Flycatcher, <i>Muscicapa striata</i>	2018	1.205km southwest	59	BOCC Red NERC s41
Whimbrel, <i>Numenius phaeopus</i>	2017	1.055km north	116	BOCC Red WACA s1p1
House Sparrow, <i>Passer domesticus</i>	2019	1.272km south	85	BOCC Red NERC s41
Black Redstart, <i>Phoenicurus ochruros</i>	2014	1.753km north	2	BOCC Red WACA s1p1 CR
Marsh Tit, <i>Poecile palustris</i>	2017	0.144km west	10	BOCC Red
Whinchat, <i>Saxicola rubetra</i>	2014	1.753km north	28	BOCC Red CR
Woodcock, <i>Scolopax rusticola</i>	2017	1.753km north	16	BOCC Red
Starling, <i>Sturnus vulgaris</i>	2018	1.004km north	970	BOCC Red
Redwing, <i>Turdus iliacus</i>	2018	1.119km south	2401	BOCC Red WACA s1p1
Song Thrush, <i>Turdus philomelos</i>	2019	1.119km south	214	BOCC Red
Fieldfare, <i>Turdus pilaris</i>	2018	1.119km south	1884	BOCC Red WACA s1p1
Ring Ouzel, <i>Turdus torquatus</i>	2016	2.548km northwest	4	BOCC Red NERC s41
Mistle Thrush, <i>Turdus viscivorus</i>	2019	1.753km north	173	BOCC Red
Lapwing, <i>Vanellus vanellus</i>	2017	1.192km north	415	BOCC Red NERC s41
Terrestrial Mammals				
European Hedgehog, <i>Erinaceus europaeus</i>	2019	0.424km north	47	NERC s41 UK BAP
Badger, <i>Meles meles</i>	2019	0.699km north	9	PBA
Hazel Dormouse, <i>Muscardinus avellanarius</i>	2011	0.98km south	7	EU Hab 4 Hab Reg 2 NERC s41 WACA s5s94b WACA s5s94c CI

APPENDIX 2- PHASE 1 HABITATS MAP

