



Preliminary Ecological Appraisal

Munden Parva, Hertfordshire

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LIABILITIES:

Whilst every effort has been made to guarantee the accuracy of this report, it should be noted that living animals and plants are capable of migration/establishing. Whilst such species may not have been located during the survey duration, their presence may be found on a site at a later date. This report provides a snap shot of the species that were present at the time of the survey only and does not consider seasonal variation. Furthermore, where access is limited or the site supports habitats that are densely vegetated, only dominant species may be recorded.

The recommendations contained within this document are based on a reasonable timeframe between the completion of the survey and the commencement of any works. If there is any delay between the commencement of works that may conflict with timeframes laid out within this document, or have the potential to allow the ingress of protected species, a suitably qualified ecologist should be consulted.

It is the duty of care of the landowner/developer to act responsibly and comply with current environmental legislation if protected species are suspected or found prior to or during works.

1.0 INTRODUCTION

Background

1.1 The Ecology Partnership was commissioned by Cousins and Cousins to undertake a Preliminary Ecological Appraisal (PEA) at Munden Parva, Hertfordshire, SG12 0PD (Figure 1).

1.2 The key objectives of a PEA (CIEEM 2017) are to:

- Identify the likely ecological constraints associated with a project;
- Identify any mitigation measures likely to be required, following the 'Mitigation Hierarchy' (CIEEM 2016; BSI 2013, Clause 5.2);
- Identify any additional surveys that may be required to inform an Ecological Impact Assessment (EcIA); and
- Identify the opportunities offered by a project to deliver ecological enhancement.

1.3 This report comprises the:

- Legislative and planning context (Section 1);
- Assessment methodologies (Section 2);
- Results (Section 3);
- Implications for development (Section 4);
- An impact assessment (Section 5); and
- Conclusions (Section 6).

Site Context

1.4 The site (TQ 1755 7200) is approximately 1.72ha and includes a large house with associated hardstanding and driveway, a large area of amenity grassland with areas of amenity planting, orchard, woodland, hedgerows, a pond and scattered trees. A semi-improved grassland field is located to the north of the driveway and is bordered by trees lines. The site is surrounded by a mosaic of arable and grassland fields with blocks of woodland.



Figure 1: Approximate location of the red-line boundary

Description of Proposed Development

- 1.5 The proposed works include the construction of a new gym/yoga studio with natural swimming pool on the existing tennis court and an area of grasscrete parking to the east. The proposed work to the house is undecided, although may include the removal of the third storey and reconstruction of the roof.

Planning Policies

- 1.6 The site was surveyed to assess its ecological value and to ensure the proposals were compliant with relevant planning policy and legislation. Policy guidance is provided by the National Planning Policy Framework (NPPF 2021) as well as policies from the East Herts District Plan. The District Plan includes the following policies which are considered relevant to ecology, biodiversity and nature conservation;

- Policy NE1 International, National and Locally Designated Nature Conservation Sites
- Policy NE2 Sites or Features of Nature Conservation Interest (Non-Designated)
- Policy NE3 Species and Habitats
- Policy NE4 Green Infrastructure

-
- 1.7 The Environment Bill (Environment Act 2021) received Royal Assent on 9th November 2021 and is now an Act of Parliament (Law). The Environment Act 2021 outlines the requirement for granted developments to provide a biodiversity value post-development which exceeds the pre-development biodiversity value of the onsite habitat by at least 10%. Proposals also need to provide a net gain in biodiversity in accordance with the NPPF (2021).
- 1.8 This report addresses the site in relation to nature conservation and wildlife and indeed to the local planning requirements as well as national planning and nature conservation legislation.
- 1.9 The site was surveyed to assess its ecological value and to ensure compliance with national and local plan policies. The report has been produced with reference to current guidelines for preliminary ecological appraisal (CIEEM 2017) and in accordance with BS 42020:2013 Biodiversity – Code of Practice for Planning and Development.

2.0 METHODOLOGY

Desktop Study

- 2.1 A desktop study was completed using an internet-based mapping service (www.magic.gov.uk) for statutory designated sites and an internet-based aerial mapping service (maps.google.co.uk) was used to understand the habitats present in and around the survey area and habitat linkages and features (ponds, woodlands, etc.) within the wider landscape.
- 2.2 Records of protected and notable species within 2km of the site were requested from Herts Environmental Records Centre (HERC). Information on the presence of non-statutory designated sites within 1km of the site was also obtained from HERC. Records were screened for relevance and age with only those from the last two decades and of species that could occur on site considered further.

Phase 1 Habitat Survey

- 2.3 A site survey was undertaken on 27th January 2022 by The Ecology Partnership ecologists Eddie Selwyn BSc (Hons) MSc QCIEEM and Digby Hayden BSc (Hons). The surveyors identified the habitats present, following the standard 'Phase 1 habitat

survey' auditing method developed by the Joint Nature Conservancy Council (JNCC). The site was surveyed on foot and the existing habitats and land uses were recorded on an appropriately scaled map (JNCC 2010). In addition, the dominant plant species in each habitat were recorded. The potential for the site to support protected species was also assessed.

- 2.4 Plant species abundance was recorded using the DAFOR scale and species abundance was assigned to one of the following categories in Table 1.

Table 1: DAFOR Scale Lettering

| DAFOR Category | Letter |
|----------------|--------|
| Dominant | D |
| Abundant | A |
| Frequent | F |
| Occasional | O |
| Rare | R |

Bat Internal and External Survey

- 2.5 The buildings on site were internally and externally assessed for their suitability for roosting bats. The survey was undertaken on the 27th January 2022 by The Ecology Partnership ecologists Eddie Selwyn BSc (Hons) MSc QCIEEM and Digby Hayden BSc (Hons), under the authority of Natural England bat licence holder Alexia Tamblyn MA (Oxon) MSc CEol CEnv MCIEEM FRGS.
- 2.6 The surveyors assessed the building visually and searched for evidence such as:
- Staining beneath or around a hole caused by natural oils in bat fur.
 - Bat droppings beneath a hole, roost or resting area.
 - Bat droppings and/or insect remains beneath a feeding area.
 - Audible squeaking from within a hole.
 - Insects (especially flies) around a hole.
 - Dead bats.
- 2.7 Buildings that are considered to have a higher potential to support roosting bats would include the following:

-
- Agricultural buildings (e.g. farmhouses, barns and outbuildings) of traditional brick or stone construction and/or with exposed beams;
 - Buildings with weatherboarding and/or hanging tiles that are within 200m of woodland and/or water;
 - Pre-1960s detached buildings and structures within 200m of woodland and/or water;
 - Pre-1914 buildings within 400m of woodland and/or water;
 - Pre-1914 buildings with gable ends or slate roofs regardless of location;
 - Buildings which are located within or immediately adjacent to woodland and/or immediately adjacent to water;
 - Dutch barns or livestock buildings with a single skin roof and board and gap or Yorkshire boarding if, following a preliminary roost assessment the site appears to be particularly suited to bats.

Additional Protected Species Assessments

2.8 Any evidence of additional protected species was recorded. Standard methods of search and measures of presence, or likely presence based on habitat suitability were used for bats in trees (Collins 2016), breeding birds (BTO 2020), hazel dormice (Bright *et al.* 2006), great crested newts (ARG 2010), reptiles (Froglife 2015), badgers (Creswell *et al.* 1990) and water voles (Strachan *et al.* 2011).

Limitations

2.9 It should be noted that whilst every effort has been made to provide a comprehensive description of the site, no single investigation could ensure the complete characterisation and prediction of the natural environment. The site was visited over the period of one site visit, as such seasonal variations cannot be observed and potentially only a selection of all species that potentially occur within the site have been recorded. Therefore, the survey provides a general assessment of potential nature conservation value of the site and does not include a definitive plant species list.

2.10 The protected species assessment provides a preliminary view of the likelihood of protected species occurring on-site, based on the suitability of the habitat and any direct evidence on site. It should not be taken as providing a full and definitive survey of any protected species group. The assessment is only valid for the time when the

survey was carried out. Additional surveys may be recommended if, on the basis of this assessment it is considered reasonably likely that protected species may be present.

3.0 RESULTS

Desktop Study

- 3.1 The site does not fall within or adjacent to any statutory designated areas, nor are there any within 2km of the site. The closest of which is Benington High Woods SSSI, approximately 3.8km northeast of the site.
- 3.2 There are 24 non-statutory sites within a 2km radius of the site. The nearest of these is Banfield Wood & Graves Wood Local Wildlife Site (LWS), approximately 70m west of site.
- 3.3 There are several units of priority habitat within 2km of the site (Figure 2). The closest is the ancient woodland (Banfield Wood), approximately 70m west of site.

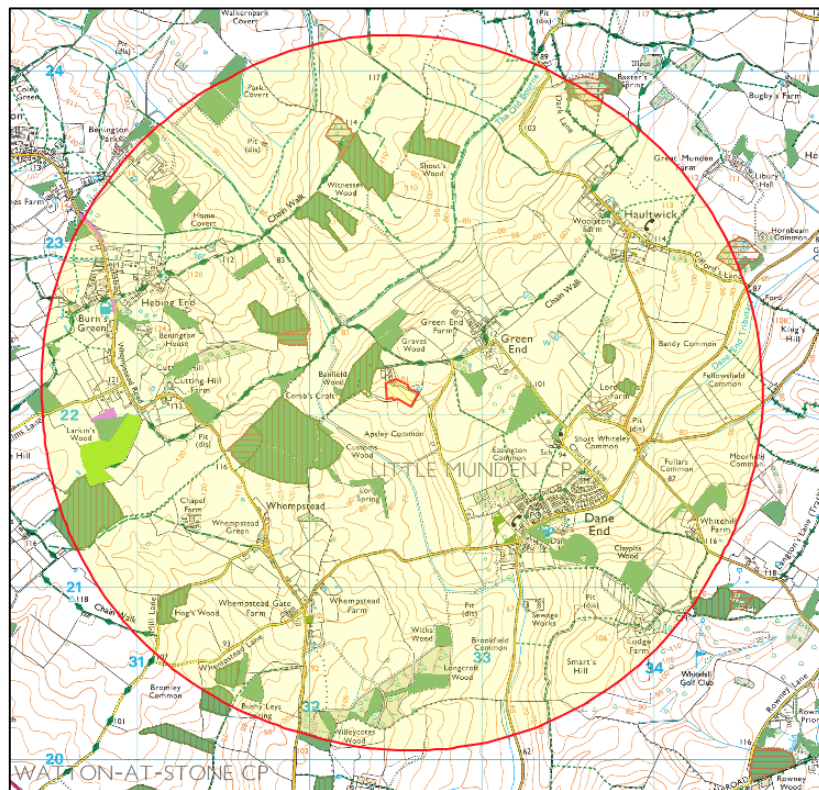


Figure 2: Priority habitat within 2km of the site. Areas of priority deciduous woodland (dark green), traditional orchard (middle green), ancient woodland (green/brown lines) and lowland meadows (light green) are present.

- 3.4 There was one small ornamental pond on site, and 4 ponds are within 250m of the site (Figure 3). Pond 1 was located on private land, and could not be accessed. Ponds 2, 3 and 4 were all able to be accessed.

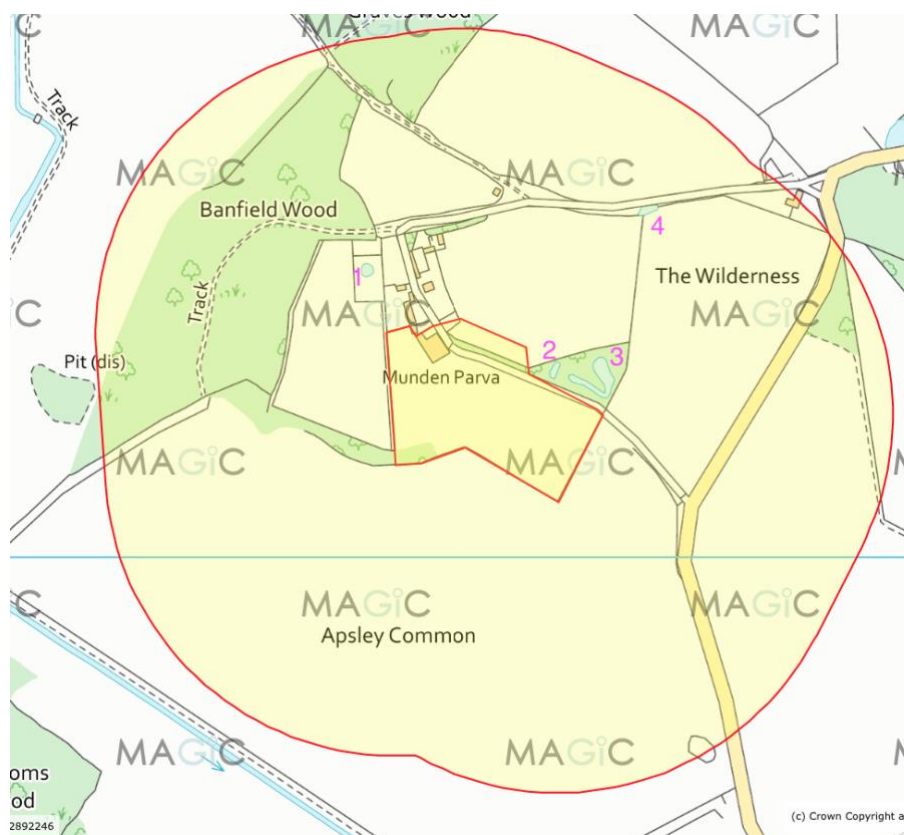


Figure 3: Ponds located within 250m of the red line boundary

- 3.5 A 2km radius data search was requested from HERC. Notable protected species from this search are outlined below (Table 2). Only records from within the last ten years and those closest to site have been included.

Table 2: Biological Records from HERC within 1km of the site from the past 10 years¹

| Species | Status | Approx. distance and direction of closest record |
|---|---|--|
| Brown Long-eared bat <i>Plecotus auritis</i> | The Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5 | c. 1.4km west (2017) |

¹ *Additional species are present within the biological records but may be older than 10 years or outside our search radius. Some species have not been included due to the likelihood of presence on site due to habitat types.

| | | |
|--|---|---------------------------|
| Great Crested Newt <i>Triturus cristatus</i> | Wildlife and Countryside Act (1981 as amended) Schedule 5; Habitats Directive Annex 2 & 4; NERC Act (2006) Section 41 | c. 1km north west (2017) |
| Natterer's Bat <i>Myotis nattereri</i> | The Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5 | Within 2km (2017) |
| Daubenton's Bat <i>Myotis daubentonii</i> | The Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5 | Within 2km (2017) |
| Brown Long-Eared Bat <i>Plecotus auritus</i> | The Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5 | Within 2km (2016) |
| Common pipistrelle <i>Pipistrellus pipistrellus</i> | The Conservation of Habitats and Species Regulations (2017) Schedule 2; Habitat and Species Directive (1992) Annex 4; Wildlife and Countryside Act (1981 as amended) Schedule 5; NERC Act (2006) Section 41; UK BAP Priority. | c. 800m South east (2016) |

Phase 1 Habitat Survey

- 3.6 The site contains a large residential house with a driveway and garden including amenity grassland, a small orchard, amenity planting, woodland, semi-improved grassland, an amenity pond, and a wide range of trees and hedgerows.
- 3.7 The habitat map is presented in **Appendix 1**. Only species of note have been listed within this section, the full species list can be found within **Appendix 3**.

Amenity grassland

- 3.8 The majority of the site consisted of amenity grassland. This was regularly managed, so was at a short sward. The grassland was dominated by cock's-foot, with red fescue, white clover and daisy.

Semi-improved grassland

- 3.9 The northernmost edge of the site includes a semi-improved grassland field. This grassland supported a longer sward compared to the amenity grassland and looks to be occasionally grazed. Species present included Yorkshire fog, common bent, perennial ryegrass, common sorrel, and creeping buttercup. Towards the edges of the field, patches of common nettle were present.

Scattered Trees

- 3.8 The site contained scattered trees throughout the residential garden, which were confined to the boundaries of the site. Species present included poplar, pear, redwood, snowdrops, cotoneaster, field maple, spruce and scots pine.

Hedgerows

- 3.9 The eastern, southern and western boundaries of the garden support hedgerows, with species including hawthorn, blackthorn, leyland cypress and yew.

Orchard

- 3.10 The western edge of the site comprised of an orchard, comprised of mature apple and young pear trees. The understorey was well managed and had a similar composition to the amenity grassland.

Tree Lines

- 3.11 Tree lines ran parallel along sections of the driveway. Species included black locust, lime, redwood, yew, field maple, silver birch and elder. The understorey of the southern line comprised of the amenity grassland, whilst the understorey of the northern tree line comprised of winter aconite, ground ivy, herb robert, cow parsley, and snowdrops.

Amenity Pond

- 3.12 A small amenity pond was present on site. The pond was well maintained and raised above the ground with a tiled edge.

Woodland

- 3.13 The eastern edge of the site comprised of an area of woodland, which was also continued to the north of the driveway. Mammal holes were present throughout, but these were considered to be rabbit due to their small size, and droppings found

nearby. Species included horse chestnut, sycamore, ash, field maple, elm, blackthorn and hawthorn.

Building

- 3.14 There was one three-storey residential dwelling on site. The entirety of the roof was slate-tiled, and mainly in good condition. Four separate roof voids were able to be accessed and assessed at the time of the survey, and are labelled in Figure 5 below.



Figure 5: Arrangement of loft voids

- 3.15 The voids all have a thick layer of insulation on the floor, supported by wooden beams. The voids contained piping and wiring of various amenities for sections of the house, but were otherwise empty.

Protected Species

Bats

- 3.16 The majority of the house has a slate tiled roof that is in good condition. A small area of flat lead roof was present on the north western face. Externally, there was one area of raised lead flashing, at the peak of the roof, in the south western corner. Otherwise some small gaps were present in various places between the soffits and the brickwork,

as well as other smaller areas of lifted lead flashing. The voids could be fully accessed at the time of the survey.

- 3.17 Void 1 was a large, u-shaped void and contained a large number of larger bat droppings, that were scattered throughout the void, with three concentrated piles along the north eastern ridge.
- 3.18 Void 2 was a smaller void, with felt lining in mostly good condition, with minor gaps at seams and joints. A light scattering of small bat droppings was present throughout.
- 3.19 Void 3 was a small void, which supported a new felt lining. A low number of scattered bat droppings were recorded throughout the void. There was a clear gap in the soffit to the east, which provided clear access into the void.
- 3.20 Void 4 was a large, long void. The felt lining was older than the previous voids, but retained good condition with only minor gaps at seams and joints. The void includes a low number of scattered bat droppings.
- 3.21 Droppings from each void were collected and sent for DNA analysis to identify the species utilising the voids (see Appendix 4). The results of the DNA testing has identified that the droppings in voids 1 and 3 are common pipistrelle. The droppings in voids 2 and 4 are brown long-eared.
- 3.22 Multiple trees within the site are considered to have suitable bat roosting features such as broken and split limbs, woodpecker holes, cavities, and dense ivy cover. However, the few trees being affected by the proposed development (installation of the new driveway) were considered to have 'negligible' potential to support roosting bats owing to their small stature and/or lack of suitable roosting features.
- 3.23 The hedgerows and tree lines surrounding the site could all provide linear commuting corridors for bats in addition to foraging opportunities. The amenity grassland and ornamental planting, which dominate the site, are considered to be of limited interest for foraging bats.

Badgers

- 3.24 No evidence of badger activity including setts were recorded within and adjacent to the site. Rabbit holes were recorded within the woodland with rabbit droppings

located outside the entrances. It is considered that badgers may use the site for foraging or commuting.

Great Crested Newts

- 3.25 The on-site habitats including amenity grassland and hardstanding are largely unsuitable for Great Crested Newts (GCN). However, the woodland, scrub, hedgerows, and semi improved grassland could prove opportunities for shelter, foraging and commuting.
- 3.26 One small ornamental pond was present on site, and 4 ponds were present within 250m of the site. Pond 1 was located 50m north west, ponds 2 & 3 were located directly adjacent to the site, in the area of woodland to the north east, and pond 4 was located 160m north east.
- 3.27 The ornamental pond on site was small, with very little aquatic flora, and considered highly unsuitable for GCN, given its construction.
- 3.28 A habitat suitability assessment was carried out for ponds 2, 3 & 4 in order to assess the suitability of the ponds to support GCN. Pond P1 could not be accessed during the survey, as it is located within private ownership. Habitat Suitability Index (HSI) is based on 10 suitability indices. These are then analysed using the equation below to obtain the geometric mean or HSI score.

$$\text{HSI} = (\text{SI}_1 \times \text{SI}_2 \times \text{SI}_3 \times \text{SI}_4 \times \text{SI}_5 \times \text{SI}_6 \times \text{SI}_7 \times \text{SI}_8 \times \text{SI}_9 \times \text{SI}_{10})^{1/10}$$

- 3.29 The calculated score should be between 0 and 1 and will fall within one of several bands, which correspond to a given category for the pond. Table 2 below shows the HSI scores and their corresponding pond suitability category. Table 3 shows the results of the HSI assessment on ponds 2, 3 & 4.

Table 2: HSI Scores and Pond Suitability

| HSI | Pond Suitability |
|------------|------------------|
| < 0.5 | Poor |
| 0.5 - 0.59 | Below Average |
| 0.6 - 0.69 | Average |
| 0.7 - 0.79 | Good |
| > 0.8 | Excellent |

Table 3: HSI Scores for nearby ponds

| Suitability indices no. | Feature | Ornamental Pond | Pond 2 | Pond 3 | Pond 4 |
|-----------------------------|-----------------------------------|----------------------|----------------|----------------|----------------------|
| 1 | Location | 1.00 | 1.00 | 1.00 | 1.00 |
| 2 | Area | 0.05 | 0.14 | 0.60 | 0.17 |
| 3 | Permanence | 0.9 | 1.00 | 1.00 | 1.00 |
| 4 | Water quality | 0.33 | 0.33 | 0.33 | 0.33 |
| 5 | Shading | 1.00 | 0.60 | 0.2 | 0.2 |
| 6 | Presence of waterfowl | 1.00 | 1.00 | 1.00 | 1.00 |
| 7 | Presence of fish | 1.00 | 1.00 | 1.00 | 1.00 |
| 8 | Pond density | 1.00 | 1.00 | 1.00 | 1.00 |
| 9 | Suitable newt habitat within 500m | 0.33 | 0.33 | 0.33 | 0.33 |
| 10 | Macrophyte content | 0.4 | 0.90 | 0.90 | 0.90 |
| 10th Root | | 0.54 | 0.64 | 0.64 | 0.57 |
| Pond Suitability | | Below Average | Average | Average | Below Average |

3.30 As outlined in table 3, ponds 2 & 3 all have a scoring of 'average' and the ornamental pond and pond 4 scored 'below average'.

Hazel Dormice

3.31 The majority of the habitats within the site are considered to be of low value for dormice, due to these habitats being subject to regular management and including amenity species. The boundary of the site contained limited hawthorn and blackthorn hedgerows which do provide some limited habitat for dormice, although these have limited connectivity to suitable habitat.

3.32 Only a single non-specific record for Dormice was returned within 2km of the site boundary and this record was from 1990 and located 0.4km (edge of the 1km grid square to the site red line boundary) southwest of the site. The local area contained good opportunities for dormice, such as the area of ancient woodland to the west, which has good connectivity to furthermore suitable habitat.

3.33 It is considered highly unlikely dormice would be present in the less favourable and fragmented habitat on site and there are no records of reptiles within 2km of the site boundary.

Reptiles

- 3.34 The majority of the site is not suitable for reptiles with the grassland subject to regular management, and there are no records of reptiles within 2km of the site boundary. Due to the lack of suitable habitats on site and nearby records, it is not considered that reptiles are present on site and they will not be discussed further within this report.

Nesting Birds

- 3.35 No evidence of nesting birds was recorded on the site or in the building on site. Nesting and foraging birds would likely utilise the trees, tree lines, woodland and hedgerows on site.

Other species

- 3.36 The site is considered suitable for hedgehogs, although no direct evidence was recorded and it is considered that hedgehogs would not be reliant on the habitat within the site, given the surrounding habitat.
- 3.37 Due to a lack of suitable habitat, the site was not considered suitable for other protected species, such as water voles and otters.

4.0 DISCUSSION

- 4.1 The following paragraphs consider the effects of the development on designated sites, priority habitats and protected and priority species. Where the desk study and Phase 1 survey provide sufficient evidence for an assessment of effects on any of these groups to be taken through planning, these are detailed below, the need for additional surveys and when and how these should be completed are summarised, if required.
- 4.2 Provisional recommendations are also given for means to achieve net biodiversity gain, following the principle (CIEEM et al. 2016) of following the mitigation hierarchy of; avoidance, minimisation of loss, compensation on site and biodiversity offset.

Effects on designated sites

- 4.3 The site does not lie within any designated sites. The closest statutory site is Benington High Woods SSSI, approximately 3.8km north east of the site and the Impact Risk Zones do not indicate that the proposed development will have any impact on statutory sites. Therefore the proposed works are not considered to result in any direct or indirect impacts to any statutory designated sites.

- 4.4 The closest non-statutory site is Banfield Wood & Graves Wood LWS, approximately 70m west of site and given the distance and scale of the proposed works, it is considered that the development would not impact (direct or indirect) this or any non-statutory designated sites.

Effects on priority habitats

- 4.5 There are a number of priority habitats within the wider landscape, which are all habitats of principle importance for the conservation of biodiversity under Section 41 of the NERC Act 2006. The closest is Banfield Wood, an area of ancient woodland that is located adjacent 70m west of the site.
- 4.6 Given the scale of the proposed works and the lack of any related habitat being removed, it is unlikely that any significant direct impacts on priority habitats will occur as a result of the development.

Effect on on-site habitats

- 4.7 The habitats on site offer limited opportunities for wildlife due to use as a residential dwelling and regular management of the grounds of the site. The habitats are widespread and common throughout the local area and the UK as a whole.
- 4.8 The proposed yoga/gym studio and swimming pond is proposed on the existing hardstanding tennis court, whilst the new driveway will remove some trees and semi-improved grassland, as well as a small area of amenity grassland, ornamental planting and scrub. Overall the impacts to ecology and biodiversity are low and the proposed development will enhance an area of existing amenity grassland to wildflower grassland and includes hedgerow planting along the driveway to offset the losses.
- 4.9 Enhancements have also been recommended below to further increase the ecological value of the proposed wildflower grassland and hedgerow planting and include additional enhancements to further increase the biodiversity of the site post-development.
- 4.10 The retention of the habitats in combination with the implementation of the below recommendations for enhancements, further surveys, mitigation, and compensation

would ensure the proposals are completed in accordance with the local planning policies.

Effects on Protected Species

Bats

- 4.11 The presence of bat droppings in all four voids confirms the main house is utilised by roosting bats (common pipistrelle and brown long-eared). If the proposed works to the house are going to be undertaken, a licence will need to be obtained from Natural England prior to any works and a total of three bat emergence and/or re-entry surveys will need to be undertaken to inform the licence application.
- 4.12 These surveys must be undertaken when bats are most active, which is between May and the end of September, although May to August is the optimum time for surveys. Dusk emergence surveys commence at least 15 minutes before sunset until 2 hours after sunset, during which time, bats are identified and recorded using a bat detector, such as the EchoMeter Touch 2. Dawn emergence surveys follow a similar methodology, commencing at least 1.5 hours before sunrise and lasting until 15 minutes after sunrise. In addition to the above, bat surveys are required to be undertaken during suitable weather conditions, when conditions are relatively dry and mild with little/no wind. Surveys are required to be spaced at least two weeks apart.
- 4.13 The proposed building works look to maintain a void within the new roof and it is highly likely that the new loft void can provide sufficient mitigation for the licence application, if the void is designed to support roosting bat.
- 4.14 The trees affected by proposals on site were assessed as having negligible potential to support roosting bats, and therefore no further survey is required.
- 4.15 The overall suitability of the site for foraging and commuting bats is limited due to the majority of the site being comprised of grassland. The hedgerows, woodland and tree lines of the site all provide potential commuting corridors for bats and will be retained as part of the proposed development. It is recommended that any proposed lighting

avoids hedgerows, woodland and trees to retained foraging opportunities post-development.

Great Crested Newts

- 4.16 The semi-improved grassland and woodland habitats on site have some potential for GCN due to the long sward of the grassland and ground cover within the woodland being able to provide shelter from predators.
- 4.17 The ornamental pond on site is considered highly unsuitable for GCN due to its raised and highly managed nature, and the lack of suitable aquatic habitat.
- 4.18 Ponds 2, 3 & 4 were all accessed during the site visit. Pond 1 lies within private land and hence could not be accessed.
- 4.19 A Natural England risk assessment was carried out in order to assess the likelihood of an offence being committed if the proposed development was undertaken. The risk assessment used the closest pond (Pond 2) to the works and the results are shown below.

| Component | Likely effect (select one for each component; select the most harmful option if more than one is likely; lists are in order of harm, top to bottom) | Notional offence probability |
|--|---|------------------------------|
| Great crested newt breeding pond(s) | No effect | 0 |
| Land within 100m of any breeding pond(s) | 0.01 - 0.1 ha lost or damaged | 0.3 |
| Land 100-250m from any breeding pond(s) | No effect | 0 |
| Land >250m from any breeding pond(s) | No effect | 0 |
| Individual great crested newts | No effect | 0 |
| | | Maximum: 0.3 |
| Rapid risk assessment result: | AMBER: OFFENCE LIKELY | |

"Amber: offence likely" indicates that the development activities are of such a type, scale and location that an offence is likely. In this case, the best option is to redesign the development (location, layout, methods, duration or timing; see **Non-licensed avoidance measures tool**) so that the effects are minimised. You can do this and then re-run the risk assessment to test whether the result changes, or preferably run your own detailed site-specific assessment. Bear in mind that this generic risk assessment will over- or under-estimate some risks because it cannot take into account site-specific details, as mentioned in caveats above. In particular, the exact location of the development in relation to resting places, dispersal areas and barriers should be critically examined. Once you have amended the scheme you will need to decide if a licence is required; this should be done if on balance you believe an offence is reasonably likely.

Figure 6: Natural England Risk Assessment – Amber

- 4.20 As outlined in table 3, ponds 2 & 3 all have a scoring of 'average' and the ornamental pond and pond 4 scored 'below average'.
- 4.21 The HSI recorded ponds 2 & 3 as having 'average' suitability to support GCN and the ornamental pond and pond 4 have 'below average' suitability. It is recommended that

ponds 1, 2, 3 & 4 are subject to eDNA surveys in order to determine the presence/likely absence of GCN. eDNA surveys analyse samples taken from the pond's water column for GCN DNA in order to indicate historical presence of GCN within the pond. These surveys must be completed between 15th April and 30th June in any given year. If presence is confirmed, Reasonable Avoidance Measures (RAMs) should be put in place on site during works.

4.22 Employing RAMs during construction will involve working practices to avoid killing and injuring individual newts and other animals. This method statement describes the required timings and precautionary actions prior and during redevelopment works, which will minimise the risk of an offence being committed under Regulation 41 of the Conservation of Habitats and Species Regulations 2010.

4.23 The following RAMs should be employed throughout development:

- Prior to the commencement of works on site, the location of the proposed development and potential compound should be kept in a state that is unattractive to GCN and without potential refuge opportunities.
- During development, construction and demolition materials, as well as skips and pallets, should be stored on hardstanding where possible and furthermore, should be elevated off the ground. This is to ensure no features are created that GCN could potentially use as refuge habitat.

4.24 Where trenches and holes are dug, these should not be left open overnight. GCN (and other amphibians, reptiles and small mammals) may get trapped in vertical-sided trenches. Therefore, where there is a risk of this occurring, the holes should be refilled or planks of wood should be placed so that any trapped animals may use these to escape.

Birds

4.25 Birds are likely to use the trees and hedgerows on site and along the boundaries for foraging and breeding. Any tree removal should be implemented outside the breeding bird season (March-September) or immediately after a nesting bird check by a suitably qualified ecologist. If active nests are identified, works in the vicinity of the nest must cease until the birds have fledged the nest.

- 4.26 Bird boxes can be hung on mature trees to increase the number of breeding opportunities throughout the site. Woodcrete (or similar) boxes are recommended as they provide better thermal properties, are longer lasting and more durable than wooden boxes. These should be positioned at least 2.5m from ground level, on retained mature trees on site

Ecological Enhancements

- 4.27 A number of enhancements have been recommended in order to enhance the ecological value of the site.
- 4.28 The proposed development includes the creation of wildflower grassland. The areas of existing grassland to be enhanced should be cut short, scarified and sown with a suitable wildflower seed mixture such as Emorsgate EG1 or EM1 during the summer or spring. The grassland should be left to establish and subject to either one or two cuts throughout the year. All arising should be removed to reduce the levels of nutrients in the soil and encourage wildflower species.
- 4.29 New hedgerow planting should include a mixture of native species including blackthorn, hawthorn, hazel, holly, elder, guelder rose, dog rose and spindle. The hedgerows should be planted with a mixture of the species, with 3 species per meter. The hedgerow planting will create new habitats for a wide range of species, including nesting birds and hedgehogs, and will create wildlife corridors and connectivity to the wider landscape.
- 4.30 It is recommended the hedgerows are subject to limited management with light pruning, between January and March, in the first two or three years of growth, if required. More intensive trimming can be completed on rotation every 2-3 years if necessary, again between January and March, which avoids the nesting bird season.
- 4.31 Planting the base and edges of hedgerows with herbaceous plants and bulbs attract bees, butterflies and other insects as well as provides ground cover for smaller animals. Seeds that are tolerant of semi-shade and are suitable for sowing beneath newly planted or established hedges would provide the greatest benefit.
- 4.32 Bat boxes should be hung on mature trees or buildings around the site to create new roosting opportunities on site. Recommended boxes include:

- Vivara Pro WoodStone Bat Box – A general purpose bat box that supports a range of species (Figure 5). These can be hung on trees in a variety of heights and aspects in order to provide a variety of micro-climates.
- Large Multi Chamber WoodStone Bat Box – This is a multipurpose box designed for larger colonies and a range of bat species including pipistrelles, noctules and brown long-eared bats. These should be hung on mature trees around the site (Figure 5).



Figure 5: Vivara Pro WoodStone Bat Box (left) and Large Multi Chamber WoodStone Bat Box (right)

4.33 The siting of bat boxes is important and have the best rate of occupancy when they are situated within or adjacent to bat-friendly features, such as treelines. The bat boxes should be situated where they are sheltered from strong winds and should be exposed to the sun for most of the day, therefore southern aspects are favourable. Multiple boxes may be hung on one large tree, facing different aspects. Bat boxes should be hung as high as possible, preferably around 5m high, although lower boxes may also be used by brown long-eared bats.

4.34 It is recommended that the proposed lighting scheme as part of the development considers bats in the surrounding area, as well as on site. All bat species are nocturnal, resting in dark conditions in the day and emerging at night to feed. Bats are known to be affected by light levels which can affect both their roosting behaviour as well as their foraging behaviour. This needs to be considered, with a sympathetic lighting scheme for the development. Recommendations include:

- Installing lighting only if there is a significant need;
- Using LED luminaries due to their lower intensity, sharp cut-off and good colour rendition – any lights with UV elements or metal halide lights should not be used;

-
- Lights with peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012);
 - Lights with an upward light ratio of 0% and good optical control;
 - Careful consideration of column height to avoid light spill;
 - Any external security lights should use motion-sensors and short (1-minute) timers;
 - Accessories such as baffles and hoods should be used as a last resort to reduce light spill and direct light only to where needed;
 - Avoid putting lighting near trees or hedgerows and angling light away from these linear features which are used by commuting and foraging bats.

5.0 IMPACT ASSESSMENT

5.1 This section of the report forms an EcIA (Ecological Impact Assessment) and is designed to quantify and evaluate the potential impacts of the development on habitats and species present on site, or within the local area.

Methodology

5.2 The approach to this assessment accords with guidance presented within the CIEEM Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM 2018). In essence, an EcIA assesses the activities associated with a proposed scheme that are likely to generate changes within identified zones of influence, on identified ecological features and receptors. The proposals are subsequently reviewed and mitigation and compensation measures are outlined which help to reduce negative impacts.

5.3 The zone of influence for the development is defined as:

- The project red-line, for effect on habitats and species;
- Adjacent habitat, considered by species, for mobile species with territories or foraging ranges that may overlap the site;
- Up to 1km for national statutory and non-statutory designations; and,
- Up to 15km for international statutory designations.

5.4 The types of features considered in the assessment of effects, to meet legislative and policy requirements are:

- Designated sites (European, national and local);

- Protected species;
- Habitats and species of principal importance (Section 41 list);
- Hedgerows and woodland, where not of principal importance; and
- Habitats, where not of principal importance, that may function as wildlife corridors or stepping stones.

Impact Assessment and Mitigation

5.6 Table 3 below summarises the impacts and required mitigation for each receptor as previously detailed in the discussion.

Table 3: Assessment of effects from the proposal after mitigation and compensation

| Feature | Scale of Importance | Mitigation/Compensation Required | Residual Effect |
|--------------------------------|---------------------|--|-----------------|
| Statutory Designated Sites | National | None required – all a considerable distance from the site, with no related habitats will being lost through this scheme and wider landscape connectivity is to be maintained | Not significant |
| Non-Statutory Designated Sites | National | None required – given the scale of the proposed works. | Not significant |
| Bats (roosting) | Undetermined | The building a confirmed bat roost 3 surveys needed to inform EPS Licence | Undetermined |
| Bats (foraging and commuting) | Undetermined | The site provides limited foraging and commuting opportunities. Those that exist are not being removed. | Undetermined |
| Nesting Birds | Local | Mitigating direct harm to nests by removal of any suitable nesting habitat outside of nesting bird season or after a check by a suitably qualified ecologist. Compensation in the form of the installation of bird boxes. | Not significant |
| GCN | Undetermined | eDNA surveys needed to determine presence/likely absence | Undetermined |
| Badgers | Local | No evidence identified on site. Precautionary method of works during construction to ensure that commuting and foraging badgers are protected. | Not significant |

| | | | |
|---------------|-----|---|-----------------|
| Other Species | N/A | The site does not support suitable habitats for reptiles, water voles, or otters and it is considered unlikely that dormice would be present within the site. | Not significant |
|---------------|-----|---|-----------------|

Summary

5.5 The development is unlikely to have any significant effects on designated sites or priority habitats in the local area, due to the location of the proposed development and the majority of the impacts are to low value habitat (semi-improved grassland and ornamental planting).

5.6 Due to the proximity of the ponds to the proposed works, eDNA surveys should be undertaken on ponds 1, 2, 3 & 4 in order to determine the presence/likely absence of GCN.

5.7 The house has a confirmed bat roost and therefore should be subject to three further surveys to inform the Natural England Licence application, if the proposed works to the house are to proceed.

6.0 CONCLUSIONS

6.1 The site does not lie within any statutory sites. The closest statutory site is Benington High Woods SSSI, approximately 3.8km north east of the site. The Impact Risk Zones do not indicate that the proposed development will have any impact and given the distance to the closest statutory site, the proposed works would not result in any impacts to statutory designated sites.

6.2 The closest non-statutory site is Banfield Wood & Graves Wood LWS located 70m west of site, and given the scale of the proposed works, it is considered that the development would not impact this or any other non-statutory designated sites.

6.3 The site is dominated by a short amenity grassland, ornamental planting, and scattered trees. These habitats are common and widespread throughout the local area and the UK as a whole.

6.4 The main house supports roosting bats (common pipistrelle and brown long-eared) in the loft voids. A Natural England Licence will be required if the proposed works to

the house are due to be undertaken. The licence will need to be supported by three further bat surveys between May and September and any new loft voids will need to be utilised for mitigation and providing roosting opportunities post-development.

- 6.5 The trees to be removed on site were considered to have 'negligible' potential for roosting bats.
- 6.6 Birds may use the introduced shrubs, hedgerows, and trees on site to nest within. Any works to these features should therefore be undertaken outside of bird nesting season (March – September inclusive) or after a nesting bird check by a qualified ecologist.
- 6.7 It is recommended that the ponds within 250m of the site are subject to further surveys to determine if great crested newts are within the site.
- 6.8 The site does not support suitable habitat for reptiles, water voles, or otters and no evidence of badger activity was recorded within the site. As such, no further surveys for these species are required.
- 6.9 Recommendations for enhancements have been made within this report, aimed at improving the ecological value of the site and providing a net gain in biodiversity post-development.

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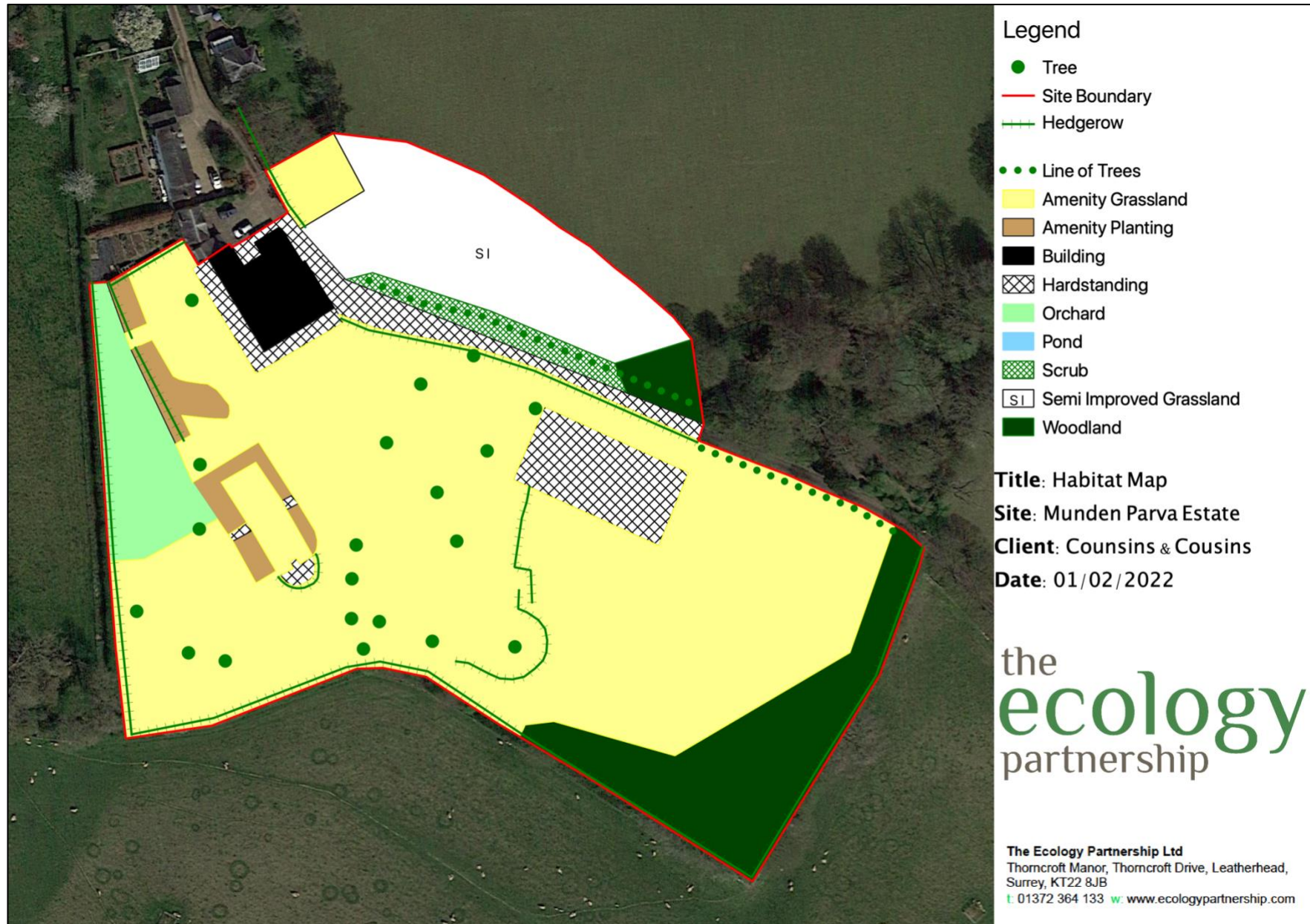
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Internet resources:

Google Maps: www.google.co.uk/maps

Magic Interactive Map: www.magic.gov.uk

Appendix 1: Habitat Map



Appendix 2: Site Photographs

Photograph 1: Small hole in felt inside roof void 1



Photograph 2: Bat droppings inside roof void 1






Photograph 3: Inside roof void 2.



Photograph 4: Inside roof void 2.



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| <p>Photograph 5: Gaps in soffit inside roof void 3.</p> |  A photograph showing the interior of a roof void. The focus is on the soffit area, which appears to be made of concrete or plaster. There are several dark, narrow gaps or recessed areas where blue light is being shined, highlighting the texture and potential issues. The overall lighting is dim, with the primary light source being the blue flashlight beams. |
| <p>Photograph 6: Inside roof void 3.</p> |  A photograph showing the interior of a roof void. The walls are made of concrete or masonry, showing some discoloration and texture. A person's leg and foot, wearing a blue boot, are visible in the lower left corner, indicating the person is standing in the void. A bright light source is illuminating the wall, creating a strong contrast and highlighting the surface details. |
| <p>Photograph 7: Inside roof void 4.</p> |  A photograph showing the interior of a roof void. The structure consists of wooden rafters and a concrete or masonry soffit. The lighting is focused on the soffit area, which shows some texture and discoloration. The rafters are visible above, and the overall scene is dimly lit, with the primary light source being a bright flashlight beam. |

Photograph 8: North western face of building



Photograph 9: Gaps between soffit and brick on north western most face.



Photograph 10: South western face, with lifted lead flashing








Photograph 11: North eastern face of building



Photograph 12: Existing driveway



| | |
|---|--|
| <p>Photograph 13: Existing tennis court</p> |  A photograph of an existing tennis court. The court is a rectangular area with a green and yellowish-green surface, enclosed by a black fence. The background shows a line of trees and a cloudy sky. |
| <p>Photograph 14: Amenity grassland</p> |  A photograph of an amenity grassland. The grass is green and appears to be mowed. There are several trees in the background, including a tall, thin tree on the right. The sky is overcast and grey. |
| <p>Photograph 15: Existing ornamental pond</p> |  A photograph of an existing ornamental pond. The pond is a long, narrow, rectangular feature with dark grey stone or concrete edges. The water is still and reflects the surrounding green grass and trees. There are some lily pads or similar plants in the water. The background shows a large, well-maintained lawn and several trees, including a large evergreen. |

| | |
|---|--|
| <p>Photograph 16: Area of orchard</p> |  A photograph showing a grassy area with several bare trees, likely an orchard, under a cloudy sky. A small wooden structure is visible in the foreground. |
| <p>Photograph 17: amenity planting and grassland</p> |  A photograph showing a large grassy area with various trees and shrubs, including a tall evergreen, under a cloudy sky. |
| <p>Photograph 18: Pond 2</p> |  A photograph showing a small pond with green algae, surrounded by grass and trees, with reflections visible in the water. |

Photograph 19: Pond 3



Appendix 3: Species List

| Common name | Latin name | DAFOR score |
|-------------------------------------|------------------------------|-------------|
| Amenity Grassland | | |
| Field maple | <i>Acer campestre</i> | R |
| White Clover | <i>Trifolium repens</i> | F |
| Daisy | <i>Bellis perennis</i> | F |
| Red Fescue | <i>Festuca rubra</i> | D |
| Creeping Buttercup | <i>Ranunculus repens</i> | F |
| Creeping Cinquefoil | <i>Potentilla reptans</i> | F |
| Yorkshire fog | <i>Holcus Lanatus</i> | F |
| Oak | <i>Quercus robur</i> | O |
| Common Self Heal | <i>Prunella vulgaris</i> | F |
| Cock's Foot | <i>Dactylis glomerata</i> | A |
| Semi-improved Grassland | | |
| Yorkshire Fog | <i>Holcus lanatus</i> | A |
| Creeping Buttercup | <i>Ranunculus repens</i> | F |
| Perennial Ryegrass | <i>Lolium perenne</i> | F |
| Common sorrel | <i>Rumex acetosa L.</i> | F |
| Red Fescue | <i>Festuca rubra</i> | F |
| Common Bent | <i>Agrostis capillaris</i> | A |
| Field Speedwell | <i>Veronica persica</i> | O |
| Cow Parsley | <i>Anthriscus sylvestris</i> | O |
| Nettles | <i>Urtica dioica</i> | O |
| Chickweed | <i>Stellaria media</i> | R |
| Scattered trees & hedges | | |
| Field Maple | <i>Leylandii sp.</i> | A |
| Oak | <i>Malus sp.</i> | O |
| Yew | <i>Carpinus sp.</i> | R |
| Poplar | <i>Quercus robur</i> | O |
| Pear | <i>Viburnum opulus</i> | R |
| Redwood | <i>Quercus cerris</i> | O |
| Field Maple | <i>Corylus sp.</i> | R |
| Spruce | <i>Fagus sp.</i> | O |
| Scots Pine | <i>Tilia sp.</i> | R |
| Hawthorn | <i>Prunus sp.</i> | R |

| Treelines and woodland | | |
|------------------------|-------------------------------|---|
| Ash | <i>Fraxinus excelsior</i> | R |
| Black locust | <i>Robinia pseudoacacia</i> | O |
| Blackthorn | <i>Prunus spinosa</i> | R |
| Box | <i>Buxus sempervirens</i> | R |
| Butchers Broom | <i>Ruscus aculeatus</i> | R |
| Cherry | <i>Prunus sp.</i> | O |
| Cow Parsley | <i>Anthriscus sylvestris</i> | R |
| Dogwood | <i>Cornus sp.</i> | O |
| Elder | <i>Sambucus nigra</i> | O |
| Elm | <i>Ulmus sp.</i> | O |
| Field Maple | <i>Acer campestre</i> | R |
| Ground Ivy | <i>Glechoma hederacea</i> | O |
| Holly | <i>Ilex sp.</i> | O |
| Horse Chestnut | <i>Aesculus hippocastanum</i> | O |
| Ivy | <i>Hedera helix</i> | O |
| Lime | <i>Tilia cordata</i> | O |
| Lords and Ladies | <i>Arum alpinum</i> | F |
| Perennial Ryegrass | <i>Lolium perenne</i> | F |
| Redwood | <i>Sequoioideae sp.</i> | O |
| Silver Birch | <i>Betula pendula</i> | O |
| Snowdrop | <i>Galanthis sp.</i> | O |
| Stinking Iris | <i>Iris foetidissima</i> | O |
| Sycamore | <i>Acer pseudoplatanus</i> | O |
| Yew | <i>Taxus baccata</i> | O |
| Winter Aconite | <i>Eranthis hyemalis</i> | F |

Appendix 4: Bat DNA Analysis



Folio No: E12482
 Report No: 1
 Purchase Order: Munden Parva
 Client: THE ECOLOGY
 PARTNERSHIP
 Contact: Digby

TECHNICAL REPORT

ANALYSIS OF BAT DROPPINGS FOR SPECIES OF ORIGIN IDENTIFICATION

SUMMARY

The droppings of bats contain small amounts of DNA belonging to the organism from which they originated. By analysing droppings collected from a bat roost or colony for the presence of DNA, a robust identification of the species present can be made. Recent advancements in molecular methods including PCR (polymerase chain reaction) and DNA sequencing mean that 92% of bat species worldwide can be identified including all 17 UK resident bat species.

RESULTS

Date sample received at Laboratory: 01/02/2022
Date Reported: 04/02/2022
Matters Affecting Results: None

| Lab Sample ID. | Site Name | O/S Reference | Genetic Sequence | Common Name | Result | Sequence Similarity |
|----------------|------------------------|---------------|---|--------------------------|--|---------------------|
| B466 | Munden Parva Loft 1 | TL3249022189 | TAATAATTGGAGCCCTGAC ATGGCATTTCCTCGTATAAA TAATATAAGTTTCTGACTCCT ACCTCCTCTTTTCTACTACT ACTAGCCTCGTCTATAGTAG AAGCGGGAGCGGTACAGG CTGAACAGTCTACCCCTC TAGCAGGAAANCT | Common pipistrelle | <i>Pipistrellus</i> <i>pipistrellus</i> | 100.00% |
| B467 | Munden Parva Loft 2 | TL3249422175 | GATTGGTGGCCACTAATAATT GGAGCCCTGATATAGCTTT TCCCGAATAAATAACATAA GCTTCTGACTGCTTCCCCA TCTTTTCTACTACTTTIAGCT TCGCTGCGAGTAGAGGCTGG AGCAGGTACCGGTTGAACAG TCTATCCTCCTTTAGCGGGA AACCTAGC | Brown long- eared bat | <i>Plecotus auritus</i> | 100.00% |
| B468 | Munden Parva Loft 3 | TL3248222183 | CTAATAATTGGAGCCCTGGA CATGGCATTTCCTCGTATAA ATAATATAAGTTTCTGACTCC TACCTCCTCTTTTCTACTAC TACTAGCCTCGTCTATAGTA GAAGCGGGAGCGGTACAG GCTGAACAGTCTATCCCTC CTAGCAGGAAA | Common pipistrelle | <i>Pipistrellus</i> <i>pipistrellus</i> | 99.31% |



Forensic Scientists and Consultant Engineers
 SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
 UK Tel: +44 (0)1332 292003 Email: scientifics@surescreen.com
 Company Registration No. 08950940

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| | | | | | | |
|------|------------------------|--------------|--|--------------------------|-------------------------|--------|
| B469 | Munden Parva Loft 4 | T13247822188 | GATTGGTGCCNCTAATAATT GGAGCCCCTGATATAGCTTT TCCCGAATAAATAACATAA GCTTCTGACTGCTTCCCCCA TCTTTTCTACTACTTTTAGCT TCGTCTGCAGTAGAGGCTGG AGCAGGTACC GGTTGAACAG TCTATCTCTCTTAGCGGGA AANC | Brown long- eared bat | <i>Plecotus auritus</i> | 99.39% |
|------|------------------------|--------------|--|--------------------------|-------------------------|--------|

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

Reported by: Chelsea Warner

Approved by: Gabriela Danickova

METHODOLOGY

Once samples have arrived in the laboratory, a single bat dropping is selected for its suitability (freshness and size). The DNA is then isolated using a commercial DNA extraction kit. Using PCR, bat DNA (if present within the sample) is amplified using bat DNA-specific molecular markers designed to amplify a short fragment of the mitochondrial gene. If amplification is successful, the resulting DNA sequence is revealed using a process known as Sanger Sequencing in order to obtain the genetic sequence. The sequence results are aligned against a library of known bat reference sequences using bioinformatics software, which enables us to determine which species the extracted DNA matches with, informing the species identity and sequence similarity (%).

If the initial analysis is unsuccessful, the entire process is repeated up to two additional times with fresh reserve droppings. If no DNA is detected after three attempts, we can be confident that any further analysis of the sample will likely also fail to result in species identification.

INTERPRETATION

Genetic Sequence: The unique DNA sequence obtained from the sample.

Sequence Similarity: How closely matched the DNA sequence from your sample is to the sequences within our reference database. This can be interpreted as a score of result accuracy, with the maximum score of 100% indicating an exact match of dropping to the indicated species' reference sequence. Lower scores (80-99%) indicate some variation between the sample and reference genetic sequence, likely due to natural variation between individual genetic sequences and/or systematic variations generated through the sequencing process. Scores below 80% similarity should be interpreted with care and can indicate part degraded or part contaminated samples.

Inconclusive Result: **Degraded sample:** DNA degraded, unable to determine species identification due to degradation of sample DNA. This can happen either before sample collection (old droppings, exposure to UV etc.) or after sample collection if stored for long periods before analysis or not handled correctly.

Inhibited/contaminated sample: Unable to determine species identity due to contamination or the suspected presence of large quantities of PCR inhibitors. Contamination sources can come from other species which come into contact with droppings, human contamination during sample collection.



Forensic Scientists and Consultant Engineers
SureScreen Scientifics Ltd, Morley Retreat, Church Lane, Morley, Derbyshire, DE7 6DE
UK Tel: +44 (0)1332 292003 Email: scientific@surescreen.com
Company Registration No. 08950940

Page 2 of 3

The Ecology Partnership Ltd

Thorncroft Manor

Thorncroft Drive

Leatherhead

KT22 8JB

Tel: 01372 364 133

www.ecologypartnership.com

Approved: Alexia Tamblyn MA (Oxon) MSc CEcol CEnv MCIEEM FRGS

Date: 14/02/2022