Elite Ecology

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The Leys,

Thornborough

Preliminary Ecological Appraisal

November 2023

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Document Control			
Document Properties			
Organisation	Elite Ecology		
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Title	The Leys, Thornborough Preliminary Ecological Appraisal		
Version History			
Date	Version	Status	Description/Changes
12/10/2023	V1	Draft	First Draft
16/10/2023	V1	Final Report	Proofread
01/11/2023	V2	Draft	Updated report to reflect the entirety of the supplied red line and blue line boundary.
14/11/2023	V2	Final Report	Proofread

0. Executive Summary

This report has been prepared at the request of Mr. Adam Powell (propreitor). It relates to the proposed re-development works at The Leys, Hatchet Leys Lane, Thornborough, Buckinghamshire, MK18 2BU (Central OS Grid Reference: SP 73790 33828). This survey effort involved both a desktop study and field survey being undertaken.

Under the current proposals, the main house (The Leys) is proposed to have the southern end demolished, and a two-storey extension constructed. In addition to this, the stables will be demolished and rebuilt. These works will result in both the permanent and temporary loss and/or alteration of some of the habitats located on the proposed redevelopment site.

Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC) was commissioned to carry out an ecological data search of all protected species and sites recorded within a 2km radius of the site. No records lay on the proposed re-development site itself, although a number of records are present in very close proximity. Please see **Section 3** for a review of the records revealed.

The preliminary ecological appraisal survey revealed multiple habitats on site. The phase 1 habitat map, habitat codes and target notes for the site are located within **Appendix D**. The following habitats were recorded on site at the time of survey (in habitat code order):

B6 – Poor Semi-Improved Grassland
C3.1 – Tall Ruderal
J2.1.2 – Species Poor Hedge
J2.4 – Fence
J3.6 – Buildings
J4 – Hard Standing Ground
J5 – Target Notes

Designated Sites:
No designated sites that were revealed by the ecological data search provided by BMERC fell on or were adjacent to the proposed re-development site itself.

Habitats:
Priority Habitats: No habitats of conservation concern were located on the site itself. Therefore, the proposed scheme of works will not impact upon any rare or valuable habitats.

Species:

Amphibians: Due to the confirmed presence of amphibians on site, possibly including great crested newts (*Triturus cristatus*), a Herptile Method Statement is required to be adhered to during the proposed works to ensure any amphibians encountered are not harmed by the works. In addition, to compensate for the potential loss of amphibian hibernacula, it is recommended that post-development a minimum of two amphibian hibernacula are created in suitable areas on or off site.

[redacted]

Bats: The stables (**B1**) was confirmed to support roosting bats and nesting birds. Therefore, a minimum of three bat activity surveys are required on the stables (**B1**) within the bat activity survey season of May to September, with at least two of these surveys carried out within the optimal bat activity survey season of May to August. In addition, the residential dwelling (**B2**) was deemed to be of low potential to support roosting bats, and therefore one bat activity survey is required on **B2** within the optimal bat activity survey season of May to August. Additional recommendations will be devised following the additional survey effort. A minimum of four surveyors are deemed necessary to cover all aspects of the buildings (two surveyors each).

Birds: Due to the confirmed presence of nesting birds within the stables, works on this structure must be undertaken outside of the main bird breeding season (March to August, inclusive). If the works are required to be undertaken during the bird breeding season, then a further inspection by a suitably qualified ecologist is required no more than twenty-four hours before these are to be removed. This is to ensure that no active nest site is illegally destroyed, due to the protection afforded to all active bird nests under the Wildlife and Countryside Act 1981. If an active nest is found by a site inspection, an exclusion zone around the nest will be necessary, where no vegetation removal can take place, to preserve this feature until the chicks have fledged the nest.

In addition, to compensate for the loss of the three barn swallow (*Hirundo rustica*) and blackbird (*Turdus merula*) nests, it is recommended that suitable bird boxes are installed in a suitable location on site post-development.

Hedgehogs (*Erinaceus europaeus*): It is recommended that precautionary measures are incorporated if works to the stables and vegetation clearance works are undertaken during the active hedgehog season of mid-March to October. This will also include provisions for hedgehogs to escape from all trenches dug into the ground, by creating slopes or providing ramps at the end of each working day. Additionally, any pipework left on site that is greater than 150mm in diameter will need to be planked off.

In addition, precautions should be in place to avoid accidental killing/injury of hedgehogs:

Contractors made aware of the potential presence of hedgehogs within the stables and nearby vegetation.
During vegetation clearance, vegetation should be initially lowered to a height of 20cm, followed by an inspection for hedgehogs. Once the area is deemed to be clear of hedgehogs, then the rest of the vegetation can be removed.
Should any non-hibernating hedgehogs be discovered within the stables, they should be picked up (with a gloved hand) and relocated off site, away from the working areas. They should be placed under a suitable hedgerow or dense vegetation.
If any hibernating hedgehogs are discovered during the works (i.e., located during the hedgehog hibernation season of November to mid-March) they must be re-covered, and works must temporarily cease in that area. Site contractors should contact an ecologist, who will visit site to ensure that suitable replacement refugia (e.g., leaf litter pile or accumulation of material most resembling what the hedgehog has been found in) can be constructed in an undisturbed part of the site that will remain unaffected for the rest of the winter. The ecologist, wearing suitable thick gloves, will then carefully translocate the specimen to the hibernacula. If there is any doubt over translocating the hedgehog to a different part of the site, or if it appears to be harmed or underweight, the ecologist will take it into care and contact the local wildlife hospital for advice.

Reptiles: Due to the potential presence of reptiles on site, a Herptile Method Statement is required to be adhered to during the proposed works to ensure any amphibians encountered are not harmed by the works.

Site Enhancements:

For the proposed site enhancements, please see **Section 5.4** of this report.

Biodiversity Net Gain:

Biodiversity Net Gain needs to be ensured within the scheme of works and this will be devised utilising the latest DEFRA metric. A feasibility report will be required to determine if a net gain is possible on site due to the private ownership anticipated for the entire land.

Contents

1. Introduction

1.1 Report Rationale

This report has been prepared at the request of Mr. Adam Powell (propreitor). It relates to the proposed re-development works at The Leys, Hatchet Leys Lane, Thornborough, Buckinghamshire, MK18 2BU (Central OS Grid Reference: SP 73790 33828). This survey effort involved both a desktop study and field survey being undertaken.

The main purpose of this assessment was to identify the broad habitats (as stated in the JNCC Phase 1 Handbook) and the flora species present within the survey area, with any further evidence of protected species usage and/or features of potential ecological interest also included. The field survey was carried out on the 18th of September 2023 by **Mr. Matthew Hodgson:** Ecologist, Natural England Bat Survey Licence Number: 2023-11375-CL18-BAT and **Mr. Lewis Simpson:** BSc (Hons), Assistant Ecologist.

1.2 Site Description and Works

The site is located in a semi-rural setting in the village of Thornborough, approximately 3km east of Buckingham. The site measures approximately 1.2ha habitats on site consists of amenity grass, broad-leaved scattered trees, building, hard standing ground, hedgerows, improved grassland, introduced shrub, and tall ruderal. Therefore, the habitats on site have potential to support a variety of protected species. The photographs of the site are found within **Appendix E**.

Within the wider landscape further habitats are present, which include arable land, buildings (and their associated gardens/yards), floodplain grazing marsh, hedgerows, lowland fen, lowland meadow, modified grassland, standing water, running water, and woodland. This shows that the habitats in the area surrounding the site have the potential to support a variety of protected species.

Under the current proposals, the main house (The Leys) is proposed to have the southern end demolished, and a two-storey extension constructed. In addition to this, the stables will be demolished and rebuilt. These works will result in both the permanent and temporary loss and/or alteration of some of the habitats located on the proposed redevelopment site.

Figure 1: An aerial map showing the approximate boundary of the surveyed site at The Leys, Thornborough (as shown by the red outline).

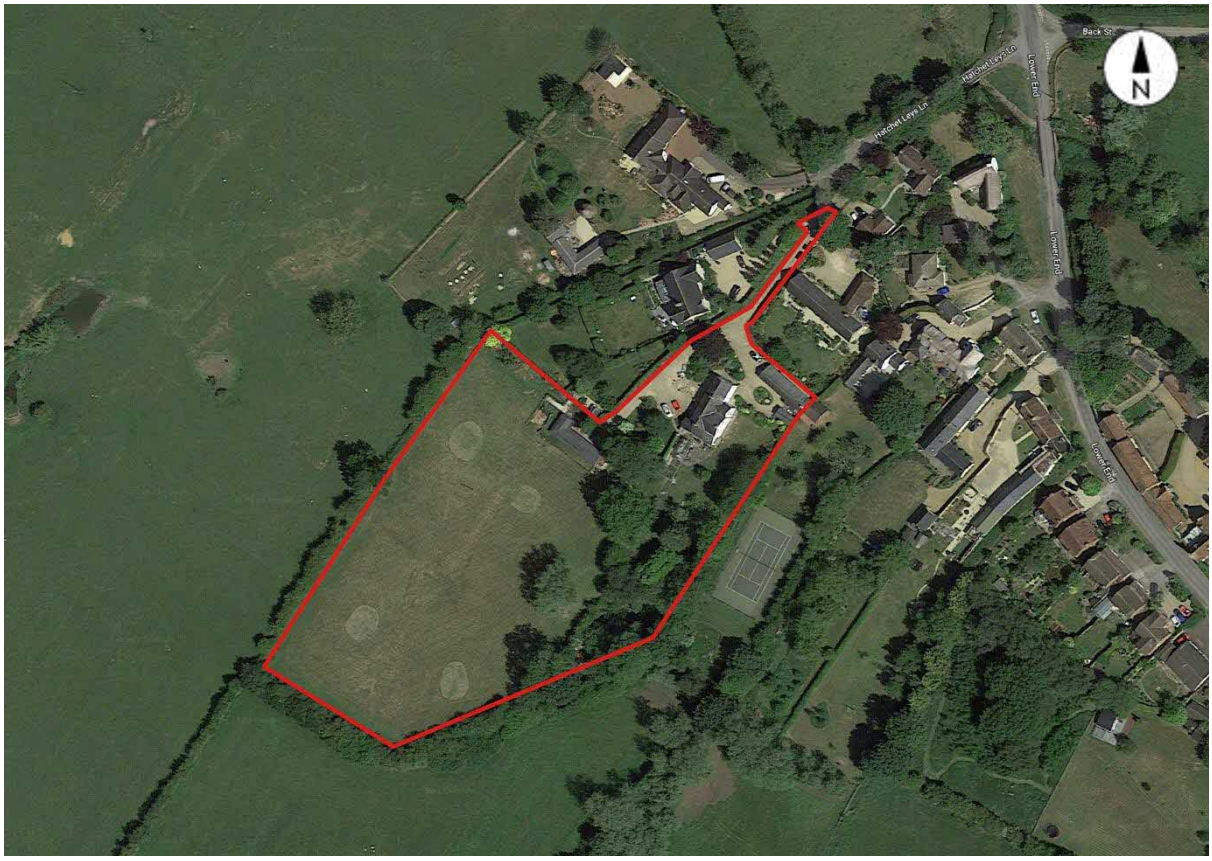


Figure 2: An aerial map showing the site at The Leys, Thornborough (as shown by the yellow star) in relation to some of the local landscape.

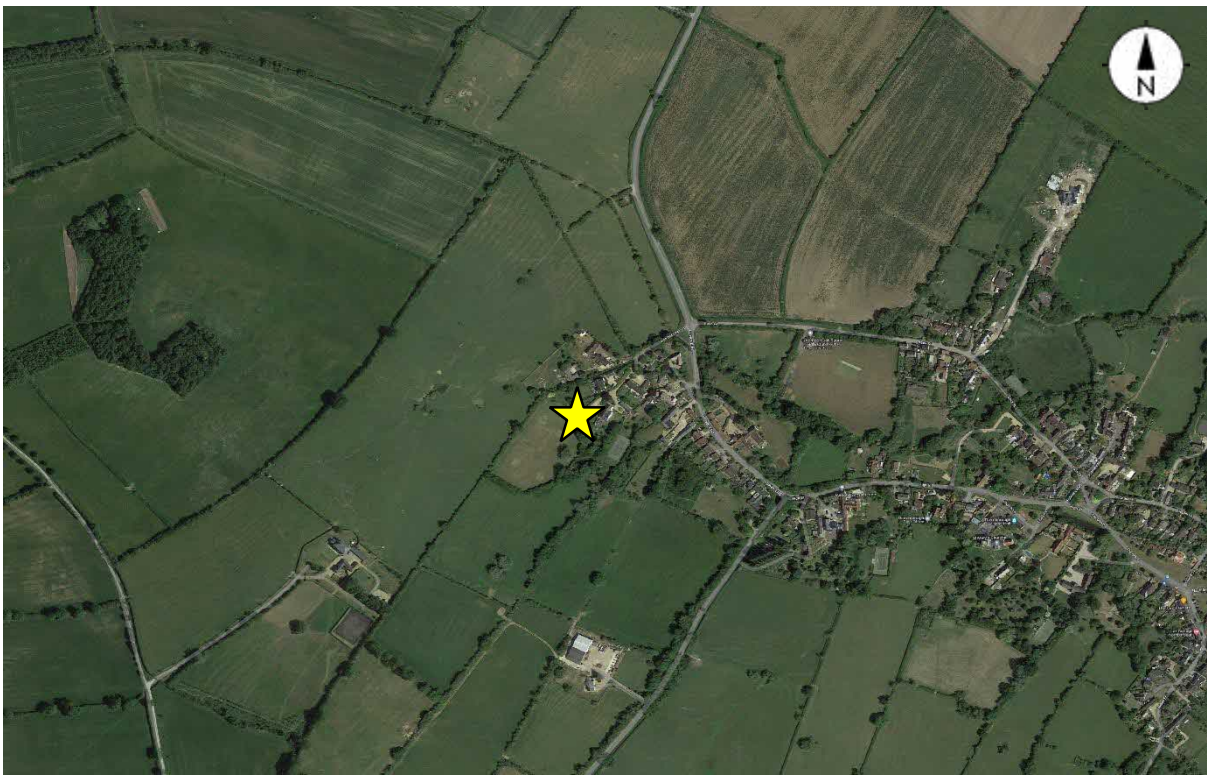
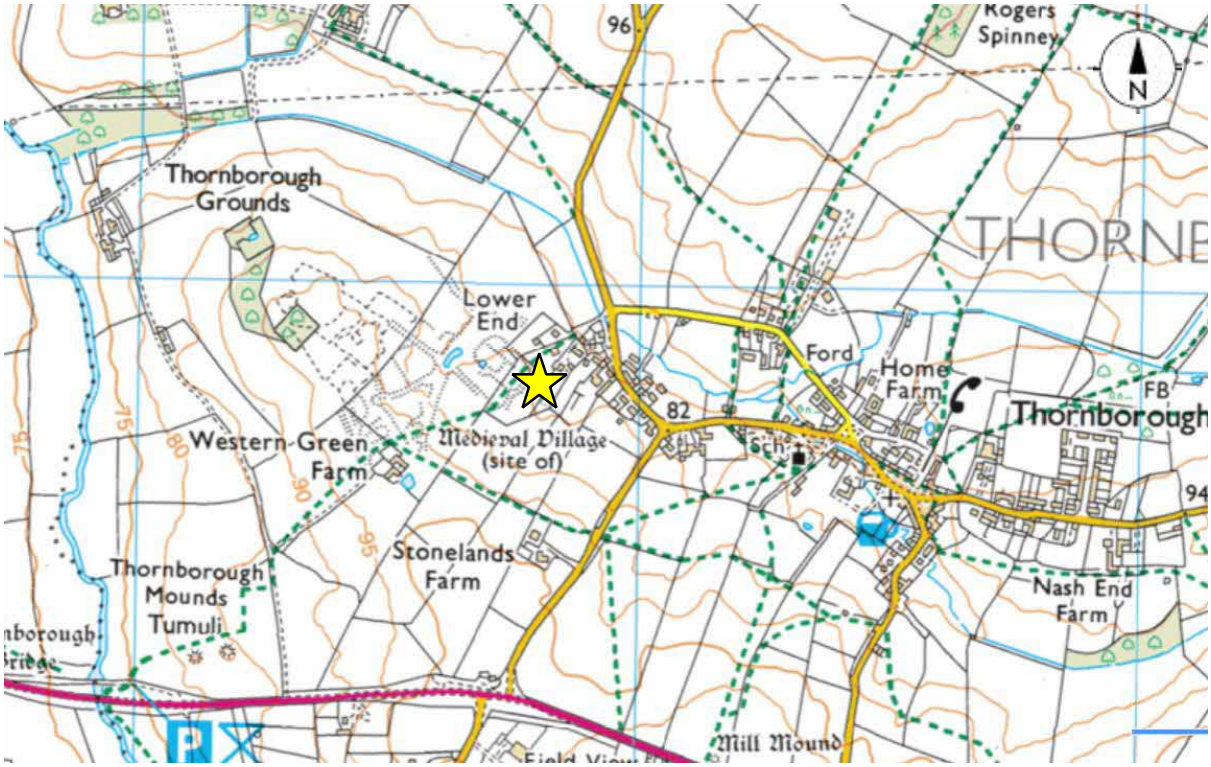


Figure 3: An OS map obtained from Bing showing the location of The Leys, Thornborough (as shown by the yellow star).



2. Survey Methodology

2.1 Desktop Survey

A variety of resources were independently consulted to assess the known local records within the nearby area and the importance of the site within the local landscape from an ecological perspective. The resources used were the Local Records Centre, www.naturalengland.org.uk, www.ordnancesurvey.co.uk, Google Maps, Google Earth, and Bing Maps. A search of other relevant nature conservation information was made through the use of the Multi-Agency Geographic Information for the Countryside (MAGIC) database.

The local records centre was contacted to provide data on all protected species and sites within 2km of the proposed development site. Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC) was the relevant local record centre for this project.

2.2 Field Survey

A Preliminary Ecological Appraisal (previously referred to as an Extended Phase 1 Habitat Survey) was carried out using the method outlined in the JNCC Handbook for *Phase 1 Habitat Survey: a technique for environmental audit (2010)*. This method aims to map and describe the broad habitat types and notable features present on the surveyed site.

As part of the field survey, the floral species will be identified and noted down. This will consider the dominant, abundant, frequent, occasional, and rare (DAFOR) species within each habitat on the survey site. The impacts of the proposed development scheme will be assessed by this report.

Each habitat will be assessed for the presence and/or the potential presence of protected species. The impacts of the proposed scheme of works on all potential protected species on site will be assessed. From this, either remedial action or recommended phase 2 presence/absence surveys will be devised.

Some of the classification codes and colours listed within the JNCC handbook may have been slightly modified for this project.

Habitat Surveys can be carried out at any time of the year, with the optimal time period falling between the months of April through until September. This survey was carried out in September 2023, which is inside the optimal time period for flora surveys. Elite Ecology feels confident that this report reflects an accurate representation of the site's suitability for protected species to be present.

All sites surveyed by Elite Ecology will be run against the relevant Local Wildlife Site Criteria to assess whether or not they meet the required standards.

3. Desktop Survey Results

3.1 Statutory Sites

The ecological data received from BMERC revealed two statutory protected sites (e.g., LNR, SSSI, SPA, SAC or Ramsar) within the 2km radius of the site. These are a Site of Special Scientific Interest (SSSI) and a Local Nature Reserve (LNR), which are as follows:

Site Name	Designation	Approx. Distance (m)	Heading
Coombes Quary	LNR	1,300	S
Pilch Fields	SSSI	1,800	SE

3.2 Non-statutory Sites

The ecological data received from BMERC confirmed the presence of seven non-statutory protected sites within 2km of the site. These were in the form of Local Wildlife Sites, Biological Notification Site (BNS), and Biodiversity Opportunity Areas (BOA). These are as follows:

Site Name	Designation	Approx. Distance (m)	Heading
Bridge East of Thornborough Mill	BNS	1,450	N
Buckingham Canal and Wet Grassland	BNS	1,420	NW
Coombes Meadow Complex	LWS	1,150	S
Hydelane Reservoir & Surroundings, Foscote	LWS	1,900	NW
River Ouse, Buckingham	BNS	1.300	NW
Thornborough Fields	LWS	1,900	E
Whaddon Chase	BOA	1,900	E

3.3 Woodland Sites

The information provided by BMERC revealed no Ancient and Semi-natural Woodland (ASNW) and/or Ancient Replanted Woodland (ARW) within the 2km search radius.

3.4 Regionally Important Geological Sites (RIGS)

The information provided by BMERC revealed no RIGS within the 2km search radius.

3.5 Species Records

3.5.1 Amphibians

Within the ecological data search provided by BMERC, four amphibian species have been revealed within 2km of the survey site. These were of common frog (*Rana temporaria*), common toad (*Bufo bufo*), great crested newt (*Triturus cristatus*) and smooth newt (*Lissotriton vulgaris*). The closest record to the site was of great crested newt(s) recorded approximately 380m to the south-east of the site.

3.5.2 Birds

Within the ecological data set received by BMERC, ninety-two bird species were revealed. The closest records to the site pertain to many bird species, all of which were recorded approximately 730m to the south-east of the site. A table with the collated bird species recorded can be found within **Appendix B**.

3.5.3 Flora

Within the ecological data search provided by BMERC, thirty-five floral species have been revealed, of which four are invasive. The closest of the higher plants was of dwarf elder (*Sambucus ebulus*), which was located approximately 230m to the south-east of the site. A table with the collated floral species recorded can be found within **Appendix B**.

3.5.4 Fungi

Within the ecological data search provided by BMERC, no fungi species have been revealed within 2km of the site.

3.5.5 Invertebrates

Within the ecological data search provided by BMERC, forty-eight invertebrate species have been identified within a 2km radius of the site. The closest record was of *Nebrioporus depressus* which was recorded approximately 1,100m to the west of the site. A table with the collated invertebrate species recorded can be found within **Appendix B**.

3.5.6 Mammals

Bats

Within the ecological data search provided by BMERC, six confirmed species of bat were revealed within the 2km search radius.

The UKBAP species recorded in the search were brown long-eared (*Plecotus auritus*), noctule (*Nyctalus noctula*), and soprano pipistrelle (*Pipistrellus pygmaeus*) bats. The non-UKBAP species recorded in the search was common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's (*Myotis daubentonii*) and Natterer's (*Myotis nattereri*). Also recorded was unidentified bat (*Chiroptera* sp.), unidentified myotis (*Myotis* sp.), and unidentified pipistrelle (*Pipistrellus* sp.).

The closest record to the survey site was of a roost of common pipistrelle bats (at least four individuals) located approximately 140m to the east of the site, at Lower End Farm, Thornborough.

Other Mammals

Within the ecological data search provided by BMERC, six other mammals were revealed within the 2km search radius. These come in the form of American mink (*Neovison vison*), brown hare (*Lepus europaeus*), Eurasian badger (*Meles meles*), European otter (*Lutra lutra*), European water vole (*Arvicola amphibius*) and west European hedgehog (*Erinaceus europaeus*). The closest record to the proposed site is of European water vole located approximately 400m to the east of the site.

3.5.7 **Reptiles**

Within the ecological data search provided by BMERC, two reptile species have been identified within 2km of the survey site. These come in the form of grass snake (*Natrix helvetica*) and slow worm (*Anguis fragilis*). The closest record to the proposal site is of grass snake located approximately 930m to the north-west of the site.

4. Field Survey

4.1 Habitats

The preliminary ecological appraisal survey revealed multiple habitats on site. The phase 1 habitat map, habitat codes and target notes for the site are located within **Appendix D**. The following habitats were recorded on site and in the surrounding area (in habitat code order):

4.1.1 A3.1 – Broad Leaved Scattered Trees

Scattered trees are present throughout the site at the south and south-east sections, and feature occasionally occurring apple (*Malus sp*.), ash (*Fraxinus excelsior*), hawthorn (*Crataegus monogyna*), hazel (*Corylus avellana*), sycamore (*Acer pseudoplatanus*), and white willow (*Salix alba*). No trees identified on site were seen to have potential to support roosting bats. This habitat overall however is deemed to be of **high** protected species potential.

4.1.2 B6 – Poor Semi-Improved Grassland

An area of unmanaged improved grassland is present on site and measures approximately 0.82ha. This grassland features tall, tussocky swards which are currently under little to no management with scattered stands of successional tall ruderal vegetation. This grass is abundant in cock's foot (*Dactylis glomerata*) and false oat-grass (*Arrhenatherum elatius*), with occasionally occurring common hogweed (*Heracleum sphondylium*), creeping buttercup (*Ranunculus repens*) and Yorkshire fog (*Holcus lanatus*). This grassland is deemed to be of **high** protected species potential, thanks to its current lack of management.

4.1.3 C3.1 – Tall Ruderal

Tall ruderal vegetation is present surrounding the stables area and is dominated by common nettle (*Urtica dioica*), with frequently occurring creeping thistle (*Cirsium arvense*), sorrel (*Rumex acetosa*) and wood avens (*Geum urbanum*). Occasionally occurring species include bramble (*Rubus fruticosus*), cleavers (*Galium aparine*), climbing nightshade (*Solanum dulcamara*), cow parsley (*Anthriscus sylvestris*), dogrose (*Rosa canina*), elder (*Sambucus nigra*), English ivy (*Hedera helix*), false oat-grass (*Arrhenatherum elatius*) and Yorkshire fog (*Holcus lanatus*). Rarely occurring species include common hogweed (*Heracleum sphondylium*), field sowthistle (*Sonchus arvensis*), hazel (*Corylus avellana*), and white dead-nettle (*Lamium album*). This habitat is deemed to be of high protected species potential.

4.1.4 J1.2 – Amenity Grass

Managed amenity grassland is present on site in the form of a garden area of the main residential dwelling. This grass features short, managed swards dominated by perennial ryegrass (*Lolium perenne*) with frequently occurring creeping buttercup (*Ranunculus repens*). Occasionally occurring species include common daisy (*Bellis perennis*), herb Robert (*Geranium robertianum*), and white clover (*Trifolium repens*). This habitat is deemed to be of **low** protected species potential.

4.1.3 **J2.1.2 – Species Poor Hedgerow**

Species poor hedgerows are present as bordering features on site. Four distinct separate hedgerows are present, designated **H1**, **H2, H3** and **H4**. **H1** is a small hornbeam (*Carpinus betulus*) hedge located to the north-east of the stables, and **H2** is a longer hedgerow bordering the western access track into the site and is dominated by Lawson's cypress (*Chamaecyparis lawsoniana*). **H3** is a bordering hedgerow at the west and south sides of the site and is dominated by hawthorn (*Crataegus monogyna*) with occasionally occurring blackthorn (*Prunus spinosa*) and rarely occurring cleavers (*Galium aparine*) and hedge bindweed (*Calystegia sepium*). **H4** is a hedgerow with trees at the east border of the site and features frequently occurring ash (*Fraxinus excelsior*), English ivy (*Hedera helix*) and sycamore (*Acer pseudoplatanus*), and occasionally occurring bramble (*Rubus fruticosus*), elder (*Sambucus nigra*) and ground ivy (*Glechoma hederacea*). **H1** and **H2** are both deemed to be of **low** protected species potential, whereas **H3** and **H4** were both deemed to be of **high** protected species potential. It was noted that many fieldfare (*Turdus pilaris*) were seen on and around **H3**, most likely feeding on the abundance of berries the hawthorn provides. Both of these hedgerows are deemed to contain protected species potential.

4.1.4 **J2.4 – Fence**

Wooden post-and-rail fences are present in some areas of the site and are not considered to be barriers to movements for herptiles and/or mammals and are therefore of no ecological significance.

4.1.5 **J3.6 – Buildings**

Four building is present on site in the form of a wooden stables (**B1**), the main residential dwelling (**B2**), a small bungalow (**B3**) and a shed (**B4**).

B1 – Wooden Stables

External Inspection

The stables measures approximately 115m^2 and are constructed from wooden panels, with wooden windows and stable doors. The north elevation of the stables features a significant roof overhang which creates a large wooden soffit. A window at the south-west elevation has a missing pane, and it is expected that some of the windows which were open at the time of survey remain open for significant periods of time, along with some of the stable doors, which will provide continuous flight access inside. The stables also features a cross-gable felt roof with a felt ridge which is in good condition.

A few gaps are present in the external wooden panels at the south-west elevation of the stables, and there is significant opportunity for flight access inside due to the aforementioned open doors and windows.

Internal Inspection

One live roosting bat was found inside the stable at the time of survey and was roosting below the roof between a wooden rafter and wooden ridge beam, at the north-east section of the stables near where the roof meets the cross-gable junction; this bat was identified as a brown long-eared (*Plecotus auritus*) bat. This section of the stables was found to be very dark due to the absence of natural light and expected low levels of disturbance.

In addition, bat droppings and moth wings were found inside the stables in this aforementioned section and were present on a chipboard partitioning wall. These bat droppings were sent off for DNA analysis and were confirmed to belong to brown long-eared bat(s). Please refer to **Appendix H** for the DNA results.

There is also continuous flight access throughout all sections of the stables, and the roof overhang creates a dark, undisturbed internal void at the north-east elevation.

In this same section of the stables, an adult common toad (*Bufo bufo*) was seen entering; likely to refugia habitat present inside this section of the stables, in the form of old logs and brash.

Multiple bird nests were also found inside the barn, in the form of three barn swallow (*Hirundo rustica*) nests and one blackbird (*Turdus merula*) nest.

In term of the internal structure of the stables, it features an open roof plan with wooden sarking below the roof with wooden partitioning walls splitting the stables up into four distinct sections.

B2 – Residential Dwelling

External Inspection

This building is the main two storey detached residential dwelling on site, and measures approximately 240m^2 and features rendered external walls with wooden doors and windows. The building features a cross gable roof with slate tiles and ridge tiles, multiple skylights, and multiple chimneys with associated lead flashing.

Multiple instances of lifted tiles are present on the east and west elevation of the building, and suitable gaps are present under the lead flashing of the chimney. No active or historic bird nests were found at the external of the building.

Internal Inspection

The internal roof void features timber joists, rafters, and purlins with brick walls. Skylights allow moderate levels of natural light into the roof void, and there are a significant number of cobwebs around the rafters, purlins, and ridge beam. The roof is lined with bitumen felt which is in overall good condition, with no significant rips/tears found. No active or historic bird nests were found during the internal inspection. No bat droppings were found during the internal inspection. In addition to this, no further anecdotal evidence of bat presence (e.g. feeding remains, urine stains etc.) was found.

B3 – Bungalow

External Inspection

This building is a bungalow with an attached garage and measures approximately 100m^2 and features rendered external walls with wooden doors and windows. The building features a gable roof with slate tiles and ridge tiles.

The tiles of the roof are in overall good condition, with no suitable lifted tiles, gaps, cracked or slipped tiles present. The walls are also in good condition with no suitable gaps or other potential roosting features present.

Internal Inspection

No internal access inside the bungalow was available during the survey visit.

Summary of the Building Inspections

Table 1 below outlines the results of the building inspections, in terms of their potential to support roosting bats and nesting birds.

Table 1: The potentials of each section of the building to support roosting bats and nesting birds, at The Leys, Thornborough.

Building	Nesting Bird Potential	Bat Roost Potential	Number of bat activity surveys required	Number of surveyors required for bat activity survey
B1	**Confirmed**	**Confirmed**	3	2
B2	**Low**	**Low**	1	2
B3	**Negligible**	**Low**	N/A*	N/A*
No bat surveys are required on B3 as it will not be affected/disturbed under the current proposals.				

Table 1: **Low/Moderate/High** potential building(s) and tree survey recommendations. The full guidance can be found in the Bat Conservation Trust Good Practice Survey Guidelines. These guidelines are what all local authorities abide by.

Bat Conservation Trust

Table 7.3 Recommended minimum number of survey visits for presence/absence surveys to give confidence in a negative result for structures (also recommended for trees but unlikely to give confidence in a negative result).

Low roost suitability	Moderate roost suitability	High roost suitability
One survey visit. One dusk emergence or dawn re-entry survey[a] (structures). No further surveys required (trees).	Two separate survey visits. One dusk emergence and a separate dawn re-entry survey.[b]	Three separate survey visits. At least one dusk emergence and a separate dawn re-entry survey. The third visit could be either dusk or dawn.[b]

[a] Structures that have been categorised as low potential can be problematic and the number of surveys required should be judged on a case-by-case basis (see Section 5.2.9). If there is a possibility that quiet calling, late-emerging species are present then a dawn survey may be more appropriate, providing weather conditions are suitable. In some cases, more than one survey may be needed, particularly where there are several buildings in this category.

[b] Multiple survey visits should be spread out to sample as much of the recommended survey period (see Table 7.1) as possible; it is recommended that surveys are spaced at least two weeks apart, preferably more. A dawn survey immediately after a dusk one is considered only one visit.

In summary, the stables (**B1**) was confirmed to support roosting bats and nesting birds. Therefore, a minimum of three bat activity surveys are required on the stables (**B1**) within the bat activity survey season of May to September, with at least two of these surveys carried out within the optimal bat activity survey season of May to August. A minimum of two surveyors are deemed necessary to cover all aspects of the building. In addition, the residential dwelling (**B2**) was deemed to be of low potential to support roosting bats, and therefore one bat activity survey is required on **B2** within the optimal bat activity survey season of May to August.

4.1.6 **J4 – Hard Standing Ground**

Hard standing ground is present on site, and is of no ecological significance

4.1.7 **J5 – Target Notes**

Target Note 1 (TN1): Brash Pile

A log pile is present on site and could be utilized by herptiles for refugia and/or nesting hedgehogs. This habitat is deemed to be of **high** protected species potential.

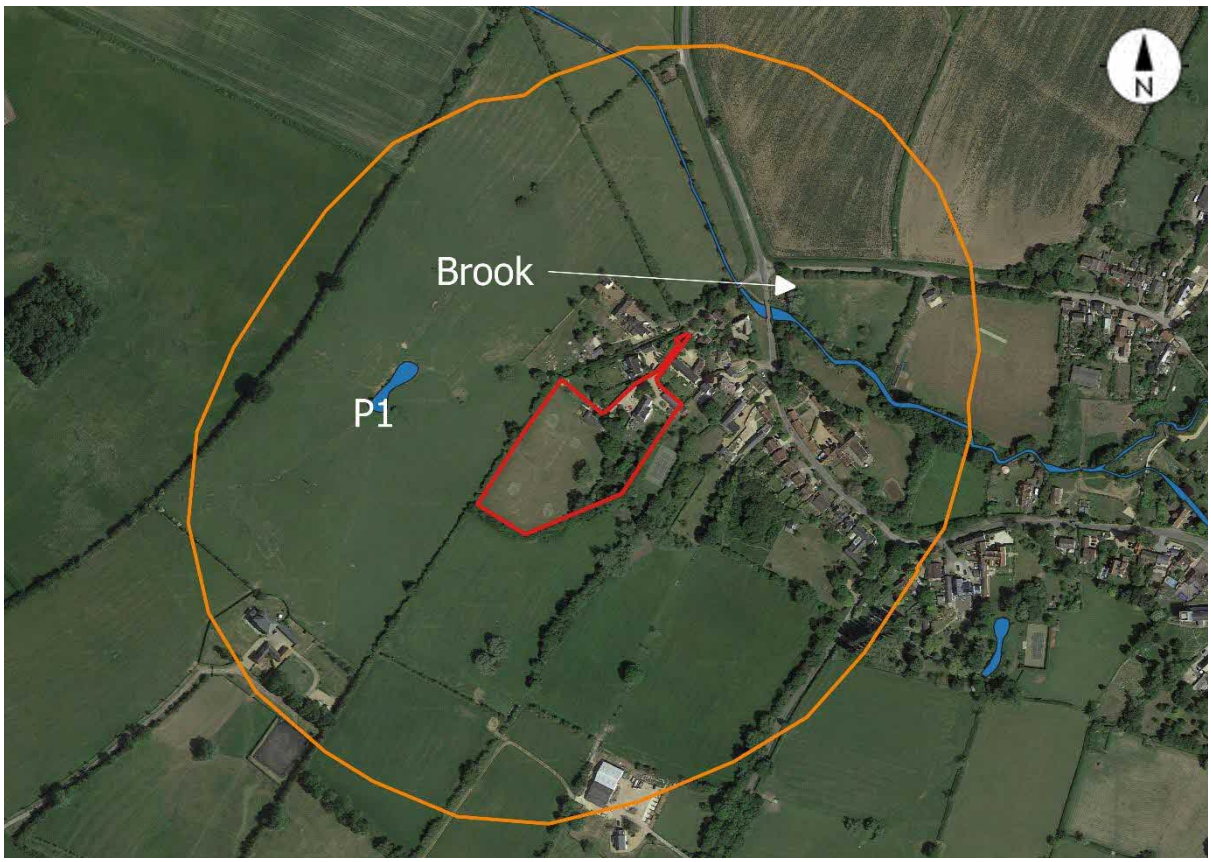
4.2 Species

The preliminary ecological appraisal survey revealed that the habitats that have been outlined for the proposed development area do contain protected species potential. The following assessment has also considered the adjacent habitats and connectivity to the wider landscape for all protected and rare species.

4.2.1 Amphibians (including great crested newts)

The site contains suitable terrestrial amphibian habitat, in the form of the stables, poor semi-improved grassland, and tall ruderal. In addition, the stables was confirmed to support amphibians due to the visual sighting of an adult female common toad (*Bufo bufo*) within the stables, likely commuting to refugia habitat present inside the stables in the form of old logs and brash. Therefore, amphibians are confirmed to be present on site. In addition, a brook, and a pond (designated **P1**) are present within 250m of the development site, both of which have suitable connectivity to the site. Due to the habitats on site, additional precautionary measures are required (please see **Section 5.3** for more information).

Figure 4: An aerial map showing the location of the pond **P1** and brook (blue shapes) within 250m (orange buffer zone) of the proposed development site (red outline) at The Leys, Thornborough.



4.2.3 **Bats**

The site is confirmed to support roosting bats, due to the visual sighting of a roosing bat inside the stables, and the presence of bat droppings inside which were confirmed to belong to brown long-eared (*Plecotus auritus*) bat(s). The site itself offers good quality foraging habitat, in the form of tall hedgerows bordering unmanaged grassland and mature scattered trees. Overall, the site is **confirmed** to support roosting bats and is of **moderate** potential to support foraging and commuting bats. Therefore, further survey effort is required (please see **Section 5.3** for more information).

4.2.4 **Birds**

The site is confirmed to support nesting birds, due to the presence of blackbird (*Turdus merula*) and barn swallow (*Hirundo rustica*) nests inside the stables. In addition, the hedgerows and scattered trees could also potentially support nesting birds. The hawthorn hedgerows bordering the south and west of the site have high potential to support wintering birds due to the abundance of berries, as noted by the abundance of fieldfare (*Turdus pilaris*) noted during the survey. Overall, the site is **confirmed** to support nesting birds, and is of **high** potential to support foraging birds. Therefore, further mitigation and precautionary measures are required (please see **Section 5.3** for more information).

4.2.5 **Flora**

The site contains no protected floral species, and the habitats are not considered likely to support any protected floral species. In addition, no invasive floral species were identified during the survey. The site is deemed to be of **negligible** potential to support rare or protected flora, and/or floral species of conservation significance.

4.2.6 **Hedgehogs (*Erinaceus europaeus*)**

The log and brash piles inside the stables, and the hedgerows could be utilised by hedgehogs for nesting and hibernation. In addition, the site is likely in occasional use by hedgehogs for commuting and foraging purposes. Overall, the site is deemed to be of **high** potential to support nesting or hibernating hedgehogs, and **moderate** potential to support foraging hedgehogs. Therefore, further precautionary measures are required (please see **Section 5.3** for more information).

4.2.7 **Invertebrates**

The habitats on site have limited potential to support a variety of common invertebrate species. However, there is no suitable habitats to support rare or protected invertebrate species. Overall, the site is deemed to be of **negligible** potential to support rare or protected invertebrate species.

4.2.8 **Reptiles**

The habitats on site are suitable to support reptiles, due to the presence of long, tussocky areas of improved grassland at the south of the site bordered by mature hedgerows. Reptiles therefore may be present within the tall ruderal vegetation surrounding the stables, with suitable south-facing basking areas also present such as log piles, and areas of hard-standing ground. Overall, the site is deemed to be of **moderate** potential to support reptiles. Therefore, further precautionary measures are required (please see **Section 5.3** for more information).

4.3 **Potential Impacts of the Works**

Based upon the results from the desktop survey, field survey and using a degree of academic supposition, the uncompensated development impacts have been summarised as follows:

Amphibians – **High**
Badgers – **Low**
Bats – **Unknown**
Birds – **High**
Flora – **Negligible**
Hedgehogs – **High**
Invertebrates – **Negligible**
Reptiles – **High**

5. Recommendations

5.1 Designated Sites

No designated sites that were revealed by the ecological data search provided by BMERC fell on or were adjacent to the proposed re-development site itself. Therefore, the proposed re-development will have no impact upon any local designated sites as the works are due to remain within the site boundary.

5.2 Habitats

No habitats of conservation concern were located on the site itself. Therefore, the proposed scheme of works will not impact upon any rare or valuable habitats.

5.3 Species

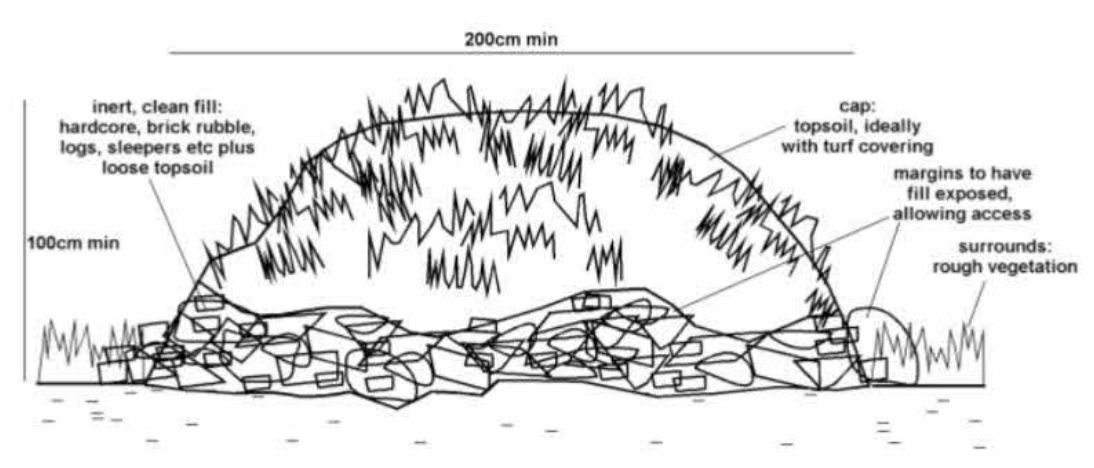
The site was found to contain the potential to support protected and/or rare species. Therefore, the following recommendations are required for the site:

5.3.1 Amphibians (including great crested newts)

Due to the confirmed presence of amphibians on site, possibly including great crested newts (*Triturus cristatus*), a Herptile Method Statement is required to be adhered to during the proposed works to ensure any amphibians encountered are not harmed by the works.

In addition, to compensate for the potential loss of amphibian hibernacula, it is recommended that post-development a minimum of two amphibian hibernacula are created in suitable areas on or off site. These are usually comprised of rubble, rock, log piles, and earth banks. An example design for the hibernacula can be seen within **Figure 5**. Please note that these hibernacula are required to ensure that great crested newts remain in favourable conservation status in the area, and that not agreeing to install these hibernacula will require presence/absence surveys for great crested newts on all ponds within 250m of the development site.

Figure 5: A diagram illustrating the recommended hibernacula (GCN Mitigation Guidelines.



5.3.3 **Bats**

The stables (**B1**) was confirmed to support roosting bats and nesting birds. Therefore, a minimum of three bat activity surveys are required on the stables (**B1**) within the bat activity survey season of May to September, with at least two of these surveys carried out within the optimal bat activity survey season of May to August. In addition, the residential dwelling (**B2**) was deemed to be of low potential to support roosting bats, and therefore one bat activity survey is required on **B2** within the optimal bat activity survey season of May to August. Additional recommendations will be devised following the additional survey effort. A minimum of four surveyors are deemed necessary to cover all aspects of the buildings (two surveyors each).

5.3.4 **Birds**

Due to the confirmed presence of nesting birds within he stables, works on this structure must be undertaken outside of the main bird breeding season (March to August, inclusive). If the works are required to be undertaken during the bird breeding season, then a further inspection by a suitably qualified ecologist is required no more than twenty-four hours before these are to be removed. This is to ensure that no active nest site is illegally destroyed, due to the protection afforded to all active bird nests under the Wildlife and Countryside Act 1981. If an active nest is found by a site inspection, an exclusion zone around the nest will be necessary, where no vegetation removal can take place, to preserve this feature until the chicks have fledged the nest.

In addition, to compensate for the loss of the three barn swallow (*Hirundo rustica*) and blackbird (*Turdus merula*) nests, it is recommended that the following bird boxes (or similar) are installed in a suitable location on site post-development.

Three Eco Swallow Nests

To be installed inside a suitable building with limited disturbance, and clear continuous permanent flight access inside. It is understood that a section of the stables to be retained and is therefore a potential swallow nest mitigation location. Other buildings may also be used, however.

One Eco Robin Nest Box

These boxes are also suitable for blackbirds. To be installed facing north to east on a nearby mature tree, at least 2.5m high and ideally covered by overhanging vegetation.

This report will be updated with block and elevation plans showing the locations of the swallow nest boxes once they have been provided to Elite Ecology.

5.3.5 **Hedgehogs (*Erinaceus europaeus*)**

It is recommended that precautionary measures are incorporated if works to the stables and vegetation clearance works are undertaken during the active hedgehog season of mid-March to October. This will also include provisions for hedgehogs to escape from all trenches dug into the ground, by creating slopes or providing ramps at the end of each working day. Additionally, any pipework left on site that is greater than 150mm in diameter will need to be planked off.

In addition, precautions should be in place to avoid accidental killing/injury of hedgehogs:

- Contractors made aware of the potential presence of hedgehogs within the stables and nearby vegetation.
- During vegetation clearance, vegetation should be initially lowered to a height of 20cm, followed by an inspection for hedgehogs. Once the area is deemed to be clear of hedgehogs, then the rest of the vegetation can be removed.
- Should any non-hibernating hedgehogs be discovered within the stables, they should be picked up (with a gloved hand) and relocated off site, away from the working areas. They should be placed under a suitable hedgerow or dense vegetation.
- If any hibernating hedgehogs are discovered during the works (i.e., located during the hedgehog hibernation season of November to mid-March) they must be re-covered, and works must temporarily cease in that area. Site contractors should contact an ecologist, who will visit site to ensure that suitable replacement refugia (e.g., leaf litter pile or accumulation of material most resembling what the hedgehog has been found in) can be constructed in an undisturbed part of the site that will remain unaffected for the rest of the winter. The ecologist, wearing suitable thick gloves, will then carefully translocate the specimen to the hibernacula. If there is any doubt over translocating the hedgehog to a different part of the site, or if it appears to be harmed or underweight, the ecologist will take it into care and contact the local wildlife hospital for advice.

5.3.6 **Reptiles**

Due to the potential presence of reptiles on site, a Herptile Method Statement is required to be adhered to during the proposed works to ensure any amphibians encountered are not harmed by the works.

5.4 Site Enhancements

For the proposed development works, the following site enhancement measures could be incorporated into the site post-development. These measures are optional but are bespoke to the site surveyed for the enhancement of biodiversity. Once the options have been finalised, the locations of these features should be placed on a master plan.

5.4.1 Bats

The site can be enhanced for bats by introducing a bat friendly planting scheme in the soft landscaping plan. The table below outlines species recommended by the Bat Conservation Trust, all of which could be incorporated into the site post development.

Flowers for borders	Trees, shrubs & climbers
Aubretia	Bramble
Candytuft	Common alder
Cherry pie	Dogrose
Corncockle	Elder
Corn marigold	English oak
Corn poppy	Gorse
Echniacea	Guelder rose
English bluebell	Hawthorn
Evening primrose	Hazel
Field poppies	Honeysuckle (native)
Honesty	Hornbeam
Ice plant ‘pink lady’	Ivy
Knapweed	Jasmine
Mallow	Pussy willow
Mexican aster	Rowan
Michaelmas daisy	Silver birch
Night-scented stock	**Herbs**
Ox-eye daisy	Angelica
Phacelia	Bergamot
Poached egg plant	Borage
Primrose	Coriander
Red campion	English marigolds
Red valerian	Fennel
Scabious	Feverfew
St. John’s Wort	Hyssop
Sweet William	Lavenders
Tobacco plant	Lemon balm
Verbena	Marjoram
Wallflowers	Rosemary
Wood forget-me-not	Sweet Cicely
Yarrow	Thyme

5.4.2 Birds

The site could be enhanced for birds by installing a variety of bird boxes on site.

5.4.3 Hedgehogs (*Erinaceus europaeus*)

The site could be enhanced for the local hedgehog population by installing at least one Eco Hedgehog Nest Box in suitable locations on site. This will create more opportunities for hedgehogs within the local landscape.

5.4.4 **Invertebrates**

The site could be enhanced for the local invertebrate population by installing at least two bug hotels in suitable locations on site. This will enhance the site for the local invertebrate populations, which will thus attract species further up in the trophic level.

5.4.5 **Reptiles**

The site could be enhanced for the local populations by creating new areas of rough grassland and scrubland, ensuring connectivity with nearby reptile habitats. These should have interfaces between the scrubland and grassland as these transitional zones create a range of microhabitats and microclimates that are favoured by reptile species. This will likely be secured under the Biodiversity Net Gain scheme.

In this section of scrubland habitat, it is recommended that log piles and brash piles are left in scattered locations. These create cover, add structure to the habitats and enhance the availability of food to the reptiles. For this project, a minimum of two of these would be necessary. Hibernacula should also be scattered though the aforementioned habitats. The hibernacula can be made of cut timber, brash, inert hardcore, bricks, rubble, rocks, tree roots, and building rubble. A minimum of one of these is advised for this project.

The key design features include:

A sunny location.
A well-drained section of the site.
One of the long sides faces south.
Access for reptiles through openings.
Location within suitable habitat
Minimal anthropogenic disturbance.
Measure at least 4m length x 2m width x 1m height, but the larger the better.

Incorporating the above site enhancement features would benefit the local herptile populations and improve their conservation status within the area.

5.5 **Biodiversity Net Gain**

Biodiversity Net Gain needs to be ensured within the scheme of works and this will be devised utilising the latest DEFRA metric. A feasibility report will be required to determine if a net gain is possible on site due to the private ownership anticipated for the entire land.

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7. Appendices

Appendix A: Site Plans

Appendix B: Desktop Study Table

Appendix C: Desktop Study Maps

Appendix D: Phase 1 Habitat Map

Appendix E: Site Photographs

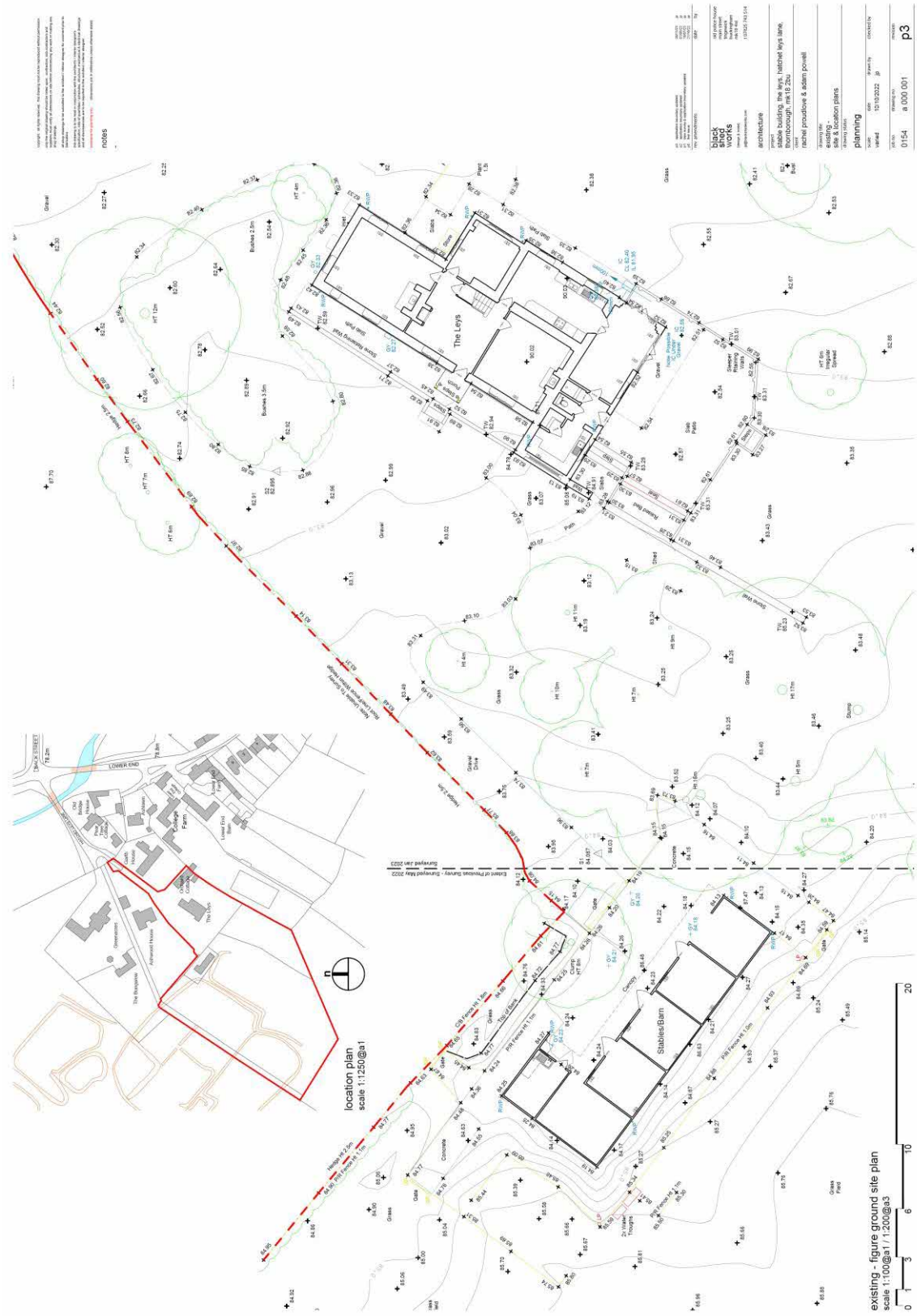
Appendix F: Biodiversity Legislation and Policy

Appendix G: Bat and Artificial Light

Appendix H: Bat Droppings DNA Results

Appendix A: Site Plans

Exisiting



Appendix B: Desktop Study Tables

The results within the following table are a collation of the species identified within the desktop search, undertaken by Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC)

Birds	
Common Name	**Latin Name**
Arctic Tern	*Sterna paradisaea*
Barn Owl	*Tyto alba*
Bittern	*Botaurus stellaris*
Black Swan	*Cygnus atratus*
Black Tern	*Chlidonias niger*
Black-headed Gull	*Chroicocephalus ridibundus*
Brambling	*Fringilla montifringilla*
Bullfinch	*Pyrrhula pyrrhula*
Canada Goose	*Branta canadensis*
Common Gull	*Larus canus*
Common Sandpiper	*Actitis hypoleucos*
Common Tern	*Sterna hirundo*
Cuckoo	*Cuculus canorus*
Curlew	*Numenius arquata*
Dunnock	*Prunella modularis*
Fieldfare	*Turdus pilaris*
Gadwall	*Mareca strepera*
Goldeneye	*Bucephala clangula*
Grasshopper Warbler	*Locustella naevia*
Green Sandpiper	*Tringa ochropus*
Greenfinch	*Chloris chloris*
Greenshank	*Tringa nebularia*
Grey Partridge	*Perdix perdix*
Grey Wagtail	*Motacilla cinerea*
Hawfinch	*Coccothraustes coccothraustes*
Herring Gull	*Larus argentatus*
Hobby	*Falco subbuteo*
House Martin	*Delichon urbicum*
House Sparrow	*Passer domesticus*
Kestrel	*Falco tinnunculus*
Kingfisher	*Alcedo atthis*
Lapwing	*Vanellus vanellus*
Lesser Black-backed Gull	*Larus fuscus*
Lesser Redpoll	*Acanthis cabaret*
Lesser Spotted Woodpecker	*Dryobates minor*
Linnet	*Linaria cannabina*

Little Gull	*Hydrocoloeus minutus*
Mallard	*Anas platyrhynchos*
Mandarin Duck	*Aix galericulata*
Marsh Tit	*Poecile palustris*
Meadow Pipit	*Anthus pratensis*
Mediterranean Gull	*Ichthyaetus melanocephalus*
Merlin	*Falco columbarius*
Mistle Thrush	*Turdus viscivorus*
Moorhen	*Gallinula chloropus*
Mute Swan	*Cygnus olor*
Nightingale	*Luscinia megarhynchos*
Osprey	*Pandion haliaetus*
Oystercatcher	*Haematopus ostralegus*
Peregrine	*Falco peregrinus*
Pintail	*Anas acuta*
Pochard	*Aythya ferina*
Purple Heron	*Ardea purpurea*
Red Kite	*Milvus milvus*
Red-crested Pochard	*Netta rufina*
Redshank	*Tringa totanus*
Redstart	*Phoenicurus phoenicurus*
Redwing	*Turdus iliacus*
Reed Bunting	*Emberiza schoeniclus*
Ring Ouzel	*Turdus torquatus*
Rook	*Corvus frugilegus*
Scaup	*Aythya marila*
Sedge Warbler	*Acrocephalus schoenobaenus*
Shoveler	*Spatula clypeata*
Skylark	*Alauda arvensis*
Snipe	*Gallinago gallinago*
Song Thrush	*Turdus philomelos*
Sparrowhawk	*Accipiter nisus*
Spotted Flycatcher	*Muscicapa striata*
Starling	*Sturnus vulgaris*
Stock Dove	*Columba oenas*
Swift	*Apus apus*
Tawny Owl	*Strix aluco*
Teal	*Anas crecca*
Tree Pipit	*Anthus trivialis*
Tree Sparrow	*Passer montanus*
Tundra Swan	*Cygnus columbianus*
Turtle Dove	*Streptopelia turtur*
Wheatear	*Oenanthe oenanthe*
Whinchat	*Saxicola rubetra*

Whitethroat	*Curruca communis*
Whooper Swan	*Cygnus cygnus*
Wigeon	*Mareca penelope*
Willow Tit	*Poecile montanus*
Willow Warbler	*Phylloscopus trochilus*
Wood Warbler	*Phylloscopus sibilatrix*
Woodcock	*Scolopax rusticola*
Woodpigeon	*Columba palumbus*
Wren	*Troglodytes troglodytes*
Yellow Wagtail	*Motacilla flava*
Yellow Wagtail	*Motacilla flava flavissima*
Yellowhammer	*Emberiza citrinella*
Flora	
Common Name	**Latin Name**
	Euphorbia exigua
	Polygala serpyllifolia
	Spergularia marina
Black-poplar	*Trifolium fragiferum*
Bladder-sedge	*Triglochin palustre*
Bluebell	*Epipactis palustris*
Box	*Anacamptis morio*
Canadian Waterweed	*Elodea nuttallii*
Chicory	*Erysimum cheiranthoides*
Common Cottongrass	*Ononis spinosa*
Corn Chamomile	*Catabrosa aquatica*
Corn Mint	*Potentilla erecta*
Devil's-bit Scabious	*Cichorium intybus*
Distant Sedge	*Knautia arvensis*
Dwarf Elder	*Elodea canadensis*
Dwarf Spurge	*Ranunculus flammula*
Field Scabious	*Stachys arvensis*
Field Woundwort	*Mentha arvensis*
Green-winged Orchid	*Lemna minuta*
Heath Milkwort	*Anthemis arvensis*
Hoary Plantain	*Briza media*
Least Duckweed	*Allium triquetrum*
Lesser Sea-spurrey	*Carex vesicaria*
Lesser Spearwort	*Sanicula europaea*
Marsh Arrowgrass	*Hyacinthoides non-scripta*
Marsh Helleborine	*Eriophorum angustifolium*
Marsh Valerian	*Carex distans*
Quaking-grass	*Sambucus ebulus*

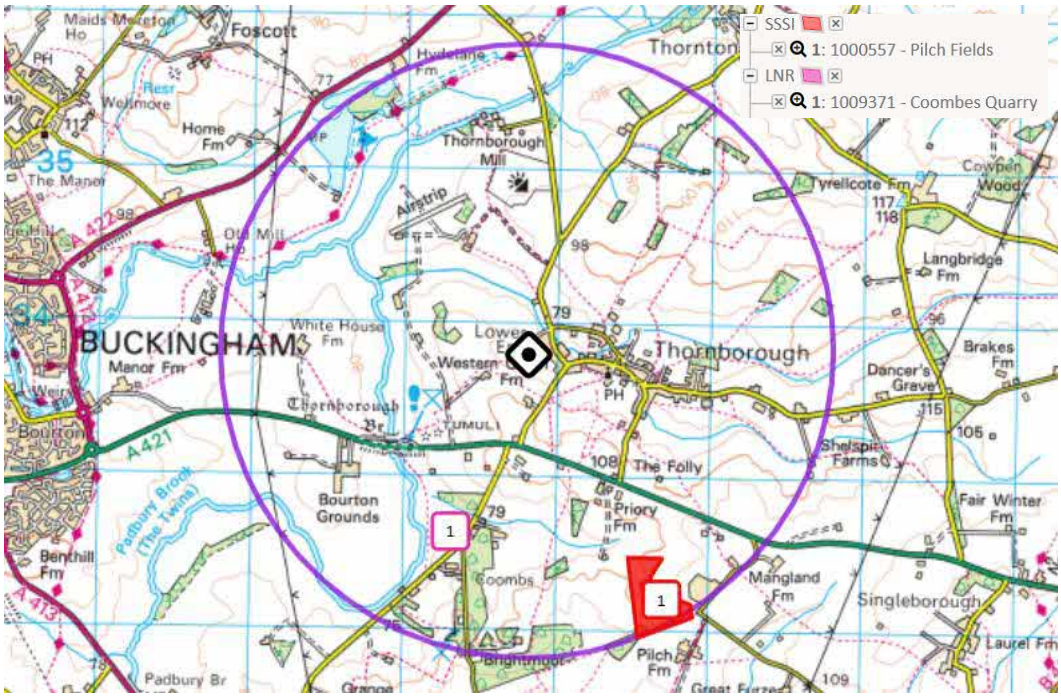
Ragged-Robin	*Succisa pratensis*
Rock Stonecrop	*Buxus sempervirens*
Sanicle	*Carex otrubae x remota = C. x pseudoaxillaris*
Spiny Restharrow	*Silene flos-cuculi*
Strawberry Clover	*Sedum forsterianum*
Tormentil	*Plantago media*
Treacle-mustard	*Populus nigra subsp. betulifolia*
Whorl-grass	*Valeriana dioica*
Invertebrates	
Common Name	**Latin Name**
	Anthocomus fasciatus
	Gymnetron villosulum
	Nebrioporus depressus
	Ophonus rupicola
	Phytoecia cylindrica
	Scydmaenus rufus
Azure Hawker	*Aeshna caerulea*
Beaded Chestnut	*Agrochola lychnidis*
Black-stigma Case-bearer	*Coleophora hemerobiella*
Blood-vein	*Timandra comae*
Buff Ermine	*Spilosoma lutea*
Bulrush Veneer	*Calamotropha paludella*
Centre-barred Sallow	*Atethmia centrago*
Cinnabar	*Tyria jacobaeae*
Common Hawker	*Aeshna juncea*
Dark-barred Twin-spot Carpet	*Xanthorhoe ferrugata*
Dot Moth	*Melanchra persicariae*
Dusky Brocade	*Apamea remissa*
Dusky Thorn	*Ennomos fuscantaria*
Essex Skipper	*Thymelicus lineola*
Feathered Gothic	*Tholera decimalis*
Ghost Moth	*Hepialus humuli*
Grass Rivulet	*Perizoma albulata*
Green-brindled Crescent	*Allophyes oxyacanthae*
Grey Dagger	*Acronicta psi*
Hairy Dragonfly	*Brachytron pratense*
Large Nutmeg	*Apamea anceps*
Mere Wainscot	*Photedes fluxa*
Mottled Rustic	*Caradrina morpheus*
Mouse Moth	*Amphipyra tragopoginis*
Necklace Ground Beetle	*Carabus monilis*

Oak Hook-tip	*Watsonalla binaria*
Oak Lutestring	*Cymatophorina diluta*
Pale Eggar	*Trichiura crataegi*
Powdered Quaker	*Orthosia gracilis*
Rosy Rustic	*Hydraecia micacea*
Rustic	*Hoplodrina blanda*
Sallow	*Cirrhia icteritia*
Shaded Broad-bar	*Scotopteryx chenopodiata*
Shoulder-striped Wainscot	*Leucania comma*
Silver-washed Fritillary	*Argynnis paphia*
Small Emerald	*Hemistola chrysoprasaria*
Small Heath	*Coenonympha pamphilus*
Small Phoenix	*Ecliptopera silaceata*
Small Square-spot	*Diarsia rubi*
Wall	*Lasiommata megera*
White Ermine	*Spilosoma lubricipeda*
Yellow-shouldered Nomad Bee	*Nomada ferruginata*

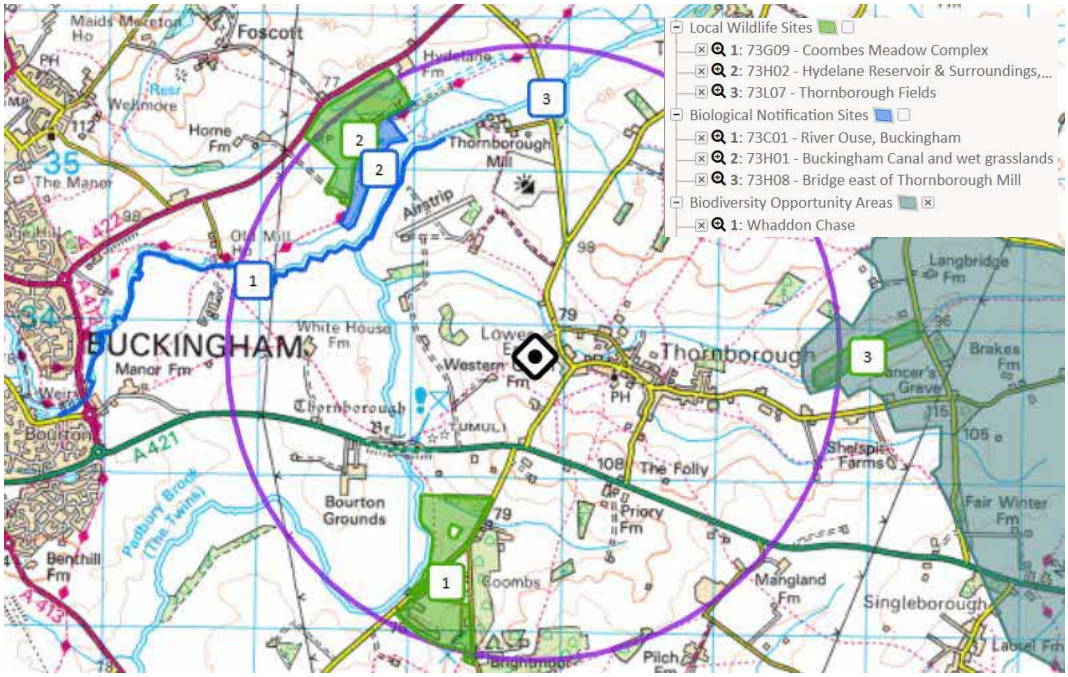
Appendix C: Desktop Study Maps

These maps have been produced by BMERC. All rights regarding the maps belong to them.

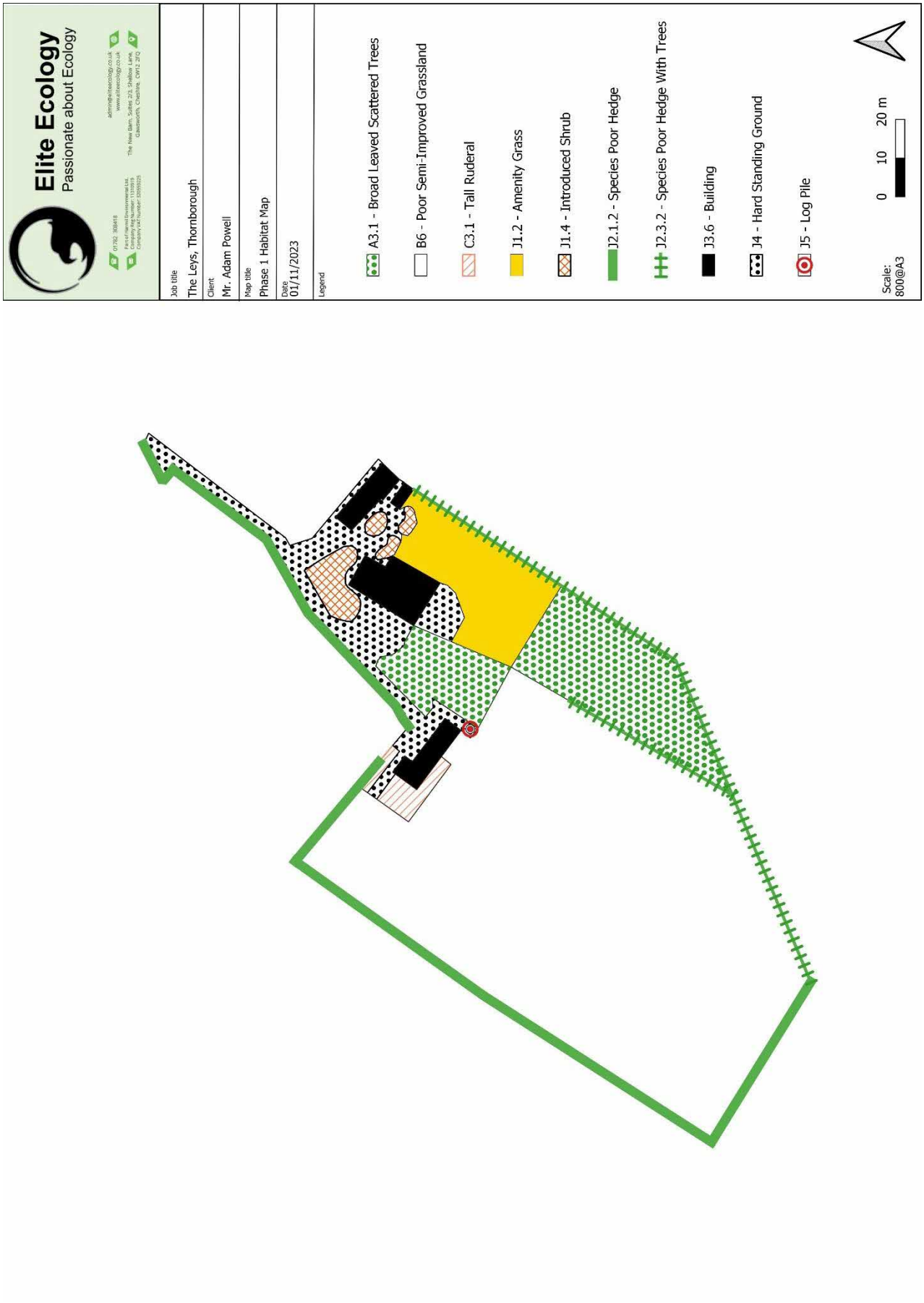
Designated Sites



Non-Statutory Sites



Appendix D: Phase 1 Habitat Map



Appendix E: Site Photographs

Plate 1: Image showing the south and east elevation of the stables.

Plate 2: Image showing the south and west elevation of the stables.

Plate 3: Image showing gaps in the wooden panels (red shapes) at the west elevation of the stables.

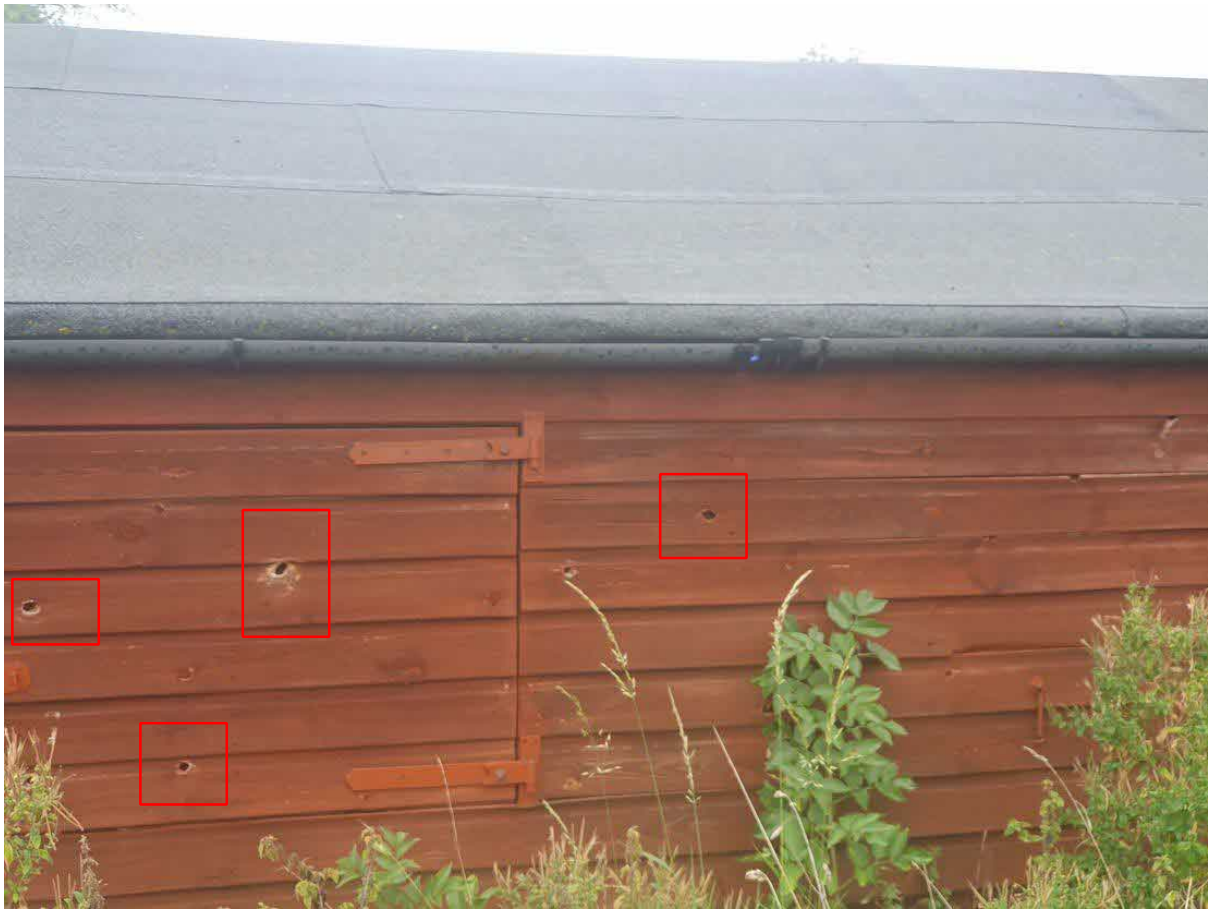


Plate 4: Image showing the missing windowpane (red shape) at the west elevation of the stables.

Plate 5: Image of the common toad (*Bufo bufo*) seen inside the stables (red shape) during the survey.

Plate 6: Image of the internal section of the stables, where both the bat and common toad were found.

Plate 7: Image of the moth wings found inside the stables.

Plate 8: Image of the bat droppings found inside the stables.

Plate 9: Image of the tall ruderal vegetation surrounding the stables.

Plate 10: Image of the tall ruderal vegetation surrounding the stables.

Plate 11: Image of the off-site modified grassland, showing the north-west section,

Plate 12: Image of the off-site modified grassland.

Plate 13: Image of the off-site modified grassland and compost heap.

Plate 14: Image of the access track and bordering hedgerow.

Plate 15: Image of the area of scattered trees.

Plate 16: Image of the area of amenity grass.

Plate 17: Image of the area of introduced shrub

Plate 18: Image of the roof void of **B2.**

Appendix F: Biodiversity Legislation and Policy

General Legislation and Policy:

The framework of legislation and policy which underpins nature conservation in England. This is a material consideration in the planning process in England.

Conservation of Habitats and Species Regulations 2017 (Habitats Regulations 2010 as amended)

The Conservation of Habitats and Species Regulations 2017 consolidate and update the Conservation Regulations 1994 and the conservation of habitats and species regulations 2010 (and all their amendments). The Conservation of Habitats and Species Regulations 2017 are the principal means by which the EEC Council Directive 92/43 (The Habitats Directive) as amended is transposed into English and Welsh law.

The Conservation of Habitats and Species Regulations 2017 place duty upon the relevant authority of government to identify sites which are of importance to the habitats and species listed in Annexes I and II of the Habitats Directive. Those sites which meet the criteria are, in conjunction with the European Commission, designated as Sites of Community Importance, which are subsequently identified as Special Areas of Conservation (SAC) by the European Union member states. The regulations also place a duty upon the government to maintain a register of European protected sites designated as a result of EC Directive 79/409/EEC on the Conservation of Wild Birds (The Birds Directive). These sites are termed Special Protection Areas (SPA) and, in conjunction with SACs, form a network of sites known as Natura 2000. The Habitats Directive introduces for the first time for protected areas, the precautionary principle; that is that projects can only be permitted having ascertained no adverse effect on the integrity of the site. Projects may still be permitted if there are no alternatives, and there are imperative reasons of overriding public interest.

The Conservation of Habitats and Species Regulations 2017 also provide for the protection of individual species of fauna and flora of European conservation concern listed in Schedules 2 and 5 respectively. Schedule 2 includes species such as otter and great crested newt for which the UK population represents a significant proportion of the total European population. It is an offence to deliberately kill, injure, disturb or trade these species. Schedule 5 plant species are protected from unlawful destruction, uprooting or trade under the regulations.

The Wildlife and Countryside Act (WCA) 1981 (As amended)

The WCA, as amended, consolidates and amends pre-existing national wildlife legislation in order to implement the Bern Convention and the Birds Directive. It complements the Conservation (Natural Habitats. & c.) Regulations 1994 (as amended), offering protection to a wider range of species. The Act also provides for the designation and protection of national conservation sites of value for their floral, faunal or geological features, termed Sites of Special Scientific Interest (SSSIs). Schedules of the act provide lists of protected species, both flora and fauna, and detail the possible offences that apply to these species.

The Countryside and Rights of Way (CRoW) Act 2000

The CROW Act, introduced in England and Wales in 2000, amends and strengthens existing wildlife legislation detailed in the WCA. It places a duty on government departments and the National Assembly for Wales to have regard for biodiversity, and provides increased powers for the protection and maintenance of SSSIs.

The Act also contains lists of habitats and species (Section 74) for which conservation measures should be promoted, in accordance with the recommendations of the Convention on Biological Diversity (Rio Earth Summit) 1992.

The Natural Environment and Rural Communities (NERC) Act 2006

Section 40 of the NERC Act places a duty upon all local authorities and public bodies in England and Wales to promote and enhance biodiversity in all of their functions. Sections 41 (England) and 42 (Wales) list habitats and species of principal importance to the conservation of biodiversity. These lists supersede Section 74 of the CRoW Act 2000. These species and habitats are a material consideration in the planning process.

The Hedgerow Regulations 1997

The Hedgerow Regulations make provision for the identification of important hedgerows which may not be removed without permission from the Local Planning Authority.

UK Biodiversity Action Plan

The United Kingdom Biodiversity Action Plan (UKBAP), first published in 1994 and updated in 2007, is a government initiative designed to implement the requirements of the Convention of Biological Diversity to conserve and enhance species and habitats. The UKBAP contains a list of priority habitats and species of conservation concern in the UK, and outlines biodiversity initiatives designed to enhance their conservation status. Lists of Broad and Local habitats are also included. The priority habitats and species correlate with those listed on Section 41 and 42 of the NERC Act.

The UKBAP requires that conservation of biodiversity is addressed at a County level through the production of Local BAPs. These are complementary to the UKBAP, however are targeted towards species of conservation concern characteristic of each area. In addition, a number of local authorities and large organisations have produced their own BAPs. UKBAP and Local BAP targets with regard to species and habitats are a material consideration in the planning process.

Vale of Aylesbury Local Plan

The VALP seeks to conserve and enhance Aylesbury Vale's biodiversity through the protection and improvement of the terrestrial and water environments and fauna and flora, relative to their importance. The VALP also seeks to protect Aylesbury Vale geodiversity, commensurate with the value and importance a site has.

Buckinghamshire and Milton Keynes Biodiversity Action Plan (BAP), including the 2009 update Forward to 2020, identifies the key principles and goals that planning decisions must take into account. The BAP's aim is to retain, protect and where possible enhance biodiversity now and in the future. For biodiversity in the Aylesbury Vale area to be supported sustainably, it needs to be meaningfully integrated into land management beyond protected sites and sites managed for wildlife. Biodiversity opportunity areas are the key areas in Buckinghamshire and Milton Keynes for the restoration and creation of priority habitat. They are the most important areas for biodiversity in Aylesbury Vale and represent a targeted approach to conserving biodiversity, and the basis for an ecological network and biodiversity improvement areas as defined in the Buckinghamshire and Milton Keynes BAP. The BAP is currently being revised by the Natural Environment Partnership to cover the period 2021-2030.

Planning Policy (England) and National Planning Policy Framework

In early 2012, the National Planning Policy Framework (NPPF) replaced much previous planning policy guidance, including Planning Policy Statement 9: Biological and Geological Conservation. The government circular 06/05: Biodiversity and Geological Conservation - Statutory Obligations and Their Impact within the Planning System, which accompanied PPS9, still remains valid. A presumption towards sustainable development is at the heart of the NPPF. This presumption does not apply however where developments require appropriate assessment under the Birds or Habitats Directives. The latest National Planning Policy Framework was updated in February 2019, with the section in relation to conserving the natural environment being located within section 15.

Section 15, on conserving and enhancing the natural environment, sets out how the planning system should contribute to and enhance the natural and local environment by minimising impacts on biodiversity and, where possible, provide net gains in biodiversity. Opportunities to incorporate biodiversity gains into a development should be encouraged. If a proposed development would result in significant harm to the natural environment which cannot be avoided (through the use of an alternative site with less harmful impacts), mitigated or compensated for (as a last resort) then planning permission should be refused.

Species Specific Legislation

This section contains a summary of legislation with relation to the species present or potentially present in the survey area. The reader should refer to the original legislation for definitive interpretation.

Nesting and Nest Building Birds

Nesting and nest building birds are protected under the Wildlife and Countryside Act WCA 1981 (as amended). Some species (listed in Schedule 1 of the WCA) are protected by special penalties.

Subject to the provisions of the act, if any person intentionally:

> kills, injures or takes any wild bird;
> takes, damages or destroys the nest of any wild bird while that nest is in use or being built; or
> takes or destroys an egg of any wild bird, he shall be guilty of an offence.

'Reckless' offences with regard to the disturbance of nesting wild birds included in Schedule 1 of the Wildlife and Countryside Act were added by the Countryside and Rights of Way Act 2000.

The Natural Environment and Rural Communities (NERC) Act 2006 places a duty on Government Departments to have regard for the conservation of biodiversity and maintains lists of species and habitats which are of principal importance for the purposes of conserving biodiversity in England and Wales. These lists include a number of bird species.

The reader is referred to the original legislation for the definitive interpretation.

Bats

All species of bat are fully protected under a variety of domestic, European and international legislation and conventions. These include:

Bern Convention (Appendix II)
Bonn Convention (Appendix II)
Conservation Regulations (Northern Ireland) 1995
Conservation of Habitats and Species Regulations 2017
Countryside Rights of Way Act 2000
Eurobats Agreement
Habitats Directive (Annexes IV and II)
Habitats Regulations 1994 (as amended) Scotland
NERC Act 2006
Wildlife and Countryside Act 1981 (as amended)
Wild Mammals Protection Act

In addition to this, some species have additional protection by being listed on the UK Biodiversity Action Plan (UKBAP).

The legislation afforded to bats makes it illegal to possess or control any live or dead specimens, to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a bat while it is occupying a structure or place which it uses for that purpose.

All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended), which protects birds, nests, eggs and nestlings from harm. In addition to this, some rarer species, such as barn owls are afforded extra protection.

National Planning Policy Framework, Section 15:

The published framework in 2018 replaces the previous Planning Policy Statement 9 and National Planning Policy (dated 2012).

Section 15: Conserving and enhancing the natural environment reaffirms the government's commitment to maintaining green belt protections and preventing urban sprawl, retains the protection of designated sites and preserves wildlife. It also aims to improve the quality of the natural environment and halt declines in species and habitats, protects and enhances biodiversity and promotes wildlife corridors.

Biodiversity 2020:

This sets out to halt overall biodiversity loss and support healthy well-functioning ecosystems by establishing coherent ecological networks, with more and better places for nature, to the benefit of wildlife and people. The government's policy is aimed at individuals, communities, local authorities, charities, business and government, which all have a role to play in delivering Biodiversity 2020.

Freshwater White-clawed Crayfish

The white-clawed crayfish is partially protected under Wildlife and Countryside Act 1981 (as amended). It is listed on schedule 5 and therefore afforded protection under Section 9 (1 and 5). Therefore, it is an offence to take white-clawed crayfish and to sell, or attempt to sell, any part of the species, alive or dead, or intend to buy or sell.

Great Crested Newt

The great crested newt (*Triturus cristatus*) is fully protected under a variety of legislation and conventions. These include:

Bern Convention (Appendix II)
Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)
Conservation of Habitats and Species Regulations 2017
EU Habitats Directive (Annex II and IV)
Nature Conservation (Scotland) Act 2004
NERC Act 2006 (Section 41 England; Section 42 Wales)
Wildlife and Countryside Act 1981 (as amended)

In addition to this, the great crested newt has been listed as a priority species on the UK Biodiversity Action Plan (UKBAP).

This legislation covers all aspects of newt life stages (eggs, efts and adult newts) and makes it illegal to damage, destroy or obstruct access to any structure or place used for shelter, protection or breeding, and to intentionally disturb a great crested newt while it is occupying a structure or place which it uses for that purpose.

Licenses can be obtained from Natural England (DEFRA) under the Conservation (Natural Habitats etc.) Regulations 1994, to permit activities for the purposes of:

Regulation 44(2)(e): Preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment, or
Regulation 44(2)(f): Preventing the spread of disease
Regulation 44(2)(g): Preventing serious damage to any form of property or fisheries
Or
If there is no satisfactory alternative.

The above regulations allow people to carry out activities which would otherwise be illegal.

Hazel Dormouse

Hazel Dormouse and their habitats are protected by:

Wildlife and Countryside Act 1981 (as amended)
Countryside Rights of Way (CROW) 2000
The Natural Environment and Rural Communities Act 2006
Conservation of Habitat and Species Regulations 2017

These make it an offence to:

Capture, injure or kill a Hazel Dormouse
Disturb a Hazel Dormouse
Damage or destroy breeding or nesting sites in use by Hazel Dormice
Disturb a Dormouse whilst it is occupying a structure or place that they use for shelter or protection
Obstruct access to any structure or place that the Dormouse uses for shelter and protection.
To possess or control any live or dead specimens.

Otter

Otters are fully protected by the European Habitats Directive (92/43/EEC) by being incorporated in annex II of the legislation. In addition to this, otters are listed on schedule 5 of the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:

To intentionally kill, injure or take an otter.
To possess or control any live or dead specimens.
To intentionally or recklessly damage, destroy or obstruct access to any structure, feature or place of shelter in use by otters.
To intentionally or recklessly disturb an otter whilst it is in occupation of a feature or structure.
To sell, possess or transport for the purpose of sale or publicly declare the desire to buy or sell otters.

Reptiles

All six native reptiles within Great Britain are legally protected, with the extent of protection varying dependent upon their rarity and conservation importance.

Those that receive full protection under the Wildlife and Countryside Act 1981 (as amended) are the rare sand lizard and smooth snake. These species also receive protection under the Conservation (Natural Habitats &c.) Regulations 1994 (also referred to as the Habitats Directive). This means that they are protected from deliberate disturbance, killing, injury or capture and the habitat in which they live is also fully protected against damage or destruction. Any activity involving disturbance or damage to habitats utilised by sand lizards or smooth snakes would require a licence issued by the Department of the Environment, Food and Rural Affairs (DEFRA) following consultation with the statutory nature conservation organisation (Natural England).

The remaining four reptile species are ‘partially protected’ under the Wildlife and Countryside Act 1981 (as amended), with these species being slow-worm, common lizard, grass snake and adder. This means that these species are protected against intentional killing, injuring and against sale, but their habitat is not protected. In planning terms this means that the presence of these species is a material consideration and there is a requirement to ensure that any reptile interest is safeguarded. If a proposed development is likely to have an impact on these reptiles, then the statutory nature conservation organisation must be notified, particularly if capture and translocation is being proposed. In some parts of the UK, sites that support common reptile species such as common lizards and slow-worms can qualify as County Wildlife Sites. Sites of this designation may receive protection in planning policy.

Water Voles

Water Voles are fully protected under the Wildlife and Countryside Act 1981 (as amended). This makes it an offence to:

To intentionally kill, injure or take a water vole.
To possess or control any live or dead specimens.
To intentionally or recklessly damage, destroy or obstruct access to any structure, feature or place of shelter in use by water voles.
To intentionally or recklessly disturb a water vole whilst it is in occupation of a feature or structure.
To sell, possess or transport for the purpose of sale or publicly declare the desire to buy or sell water voles.

Non-Native Floral Species

It is an offence under schedule 9 of the Wildlife and Countryside Act 1981 (as amended) to plant or otherwise cause non-native flora to grow in the wild. This includes the transportation of earth that has previously had non-native species growing and includes the spread of the species.
All stands of non-native floral species need to be disposed of safely at a licenced landfill site according to the Environmental Protection Act (Duty of Care) Regulations 1991.

Appendix G: Bats and Artificial Light

Artificial lighting is known to affect bat's roosting and foraging behaviour, with lighting resulting in a range of impacts that includes roost desertion (BCT, 2009), delayed emergence of roosting bats (Downs et al., 2003), increased activity of some bat species and decreased activity by others (Stone et al., 2012).

An experimental approach using LED units, demonstrated that relatively fast-flying bat species, including the common pipistrelle, showed no significant impacts as a result of new artificial lighting, even when lighting was set at relatively high levels close to 50 lux.

In contrast, slow flying bats such as the myotid bats (Myotis spp.) showed sharp reductions in presence, even at low light levels of 3.6 lux (Stone et al., 2012).

Current recommendations for all bat species specify that no bat roost should be directly illuminated.

Due to the impacts of lighting, mitigation and sensitive lighting design schemes are required for projects where bats are present. These should include bat friendly lighting plans that should aim to avoid lighting wherever possible. If this is not possible, then the minimisation of any lighting impacts is required by adopting the following measures:

To introduce lighting curfews or use of PIR sensors.

Lighting curfews can be an effective way of avoiding impacts on bats. These curfews may involve either turning off lighting or dimming light units at specific times of the night, dimming units at key times of the year, providing the luminaire allows for this option via a control unit. Lighting to be triggered by PIR sensors can be expected to be illuminated only when required and for a low proportion of time.

To consider no lighting solutions where possible.

Options such as white lining, good signage and LED cats eyes should be considered as preferable. Reflective fittings may help make use of headlights to provide any necessary illumination in some areas.

To use only high pressure sodium or warm white LED lamps where possible.

High pressure sodium and warm white LED lamps emit lower proportions of insect attracting UV light than mercury, metal halide lamps and white LED lighting. Generally, lamps should have a lower proportion of white or blue wavelengths, with a colour temperature <4200 kelvin recommended (BCT, 2014).

To minimise the spread of light.

The light spread should be kept at or near horizontal to ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required. Baffles, hoods, louvres and shields should be used where necessary to reduce light spill.

To consider the height of the lighting column.

While downward facing bollard lighting is often preferable, it should be noted that a lower mounting height does not automatically reduce impacts to bats as bollard lighting can often be designed to provide up-lighting. Where bollard lighting is considered to be the most appropriate system, bollard spacing, or unit density should be kept to a minimum and units should be fitted with the appropriate hoods/deflectors to reduce any up-lighting.

To avoid reflective surfaces below lights.

The polarisation of light by shiny surfaces attracts insects increasing bat activity (BCT, 2012). Consequently, surface materials around lighting require consideration.

Appendix H: Bat Droppings DNA Results

WARWICK
THE UNIVERSITY OF WARWICK

EcoWarwicker
Ecological Forensics

9 October 23

Re: Identification Results for Richard Millington, Elite Ecology

Job number 20251, received 22 September 2023
Sample labelled: The Leys, Hatchet Leys Lane, Thornborough, Buckingham, Buckinghamshire, MK18 2BU, 18/9/23.
PCR amplification successful. DNA sequence:
ATGACCAACATTCGAAAGTCCCACCCTCTCATAAAAATTATCAATGACTCATTCATTG
ACTTACCTGCTCCCTCAAATATTTCATCATGATGAAACTTTGGATCTCT

Phylogenetic analysis identification: *Plecotus auritus*

Confirmed by maximum likelihood, maximum parsimony, bootstrap 100%.

Best regards,

Professor Robin Allaby

The results and conclusions in this report are based on an investigation of mtDNA sequence analysis. The results obtained have been reported with accuracy. The interpretation represents the most probable conclusion for the DNA sequence obtained rather than the sample provided given current levels of species data. It should be borne in mind that different circumstances might produce different results. Therefore, care must be taken with interpretation of the results especially if they are used as the basis for commercial recommendations.

Professor Robin Allaby

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The survey results purport the current status of the site and its potential for protected species utilisation at the time of surveying. It should not be viewed as a complete list of the possible flora and fauna species that could be using the site at different times of the year.

Elite Ecology has been provided with full payment for this report and thus the product has been released to the client(s) for the purpose of their planning application. If any part of the report is lost or altered without the written permission of Elite Ecology, then the entire report becomes invalid. Due to the potential for continual change within the natural world, this report is valid for **2 years only** from the date of the last survey visit. If this report is submitted after the 2 year deadline, then a further updated inspection will be required to ascertain whether the site remains in the same condition as it was when initially inspected.

No reliance should be made on any such comments in relation to the structural integrity of the features located on the surveyed site. All information within the report is based solely on evidence that has been found on site during the service provided. No individual opinion or inference will be made other than that of the suitably qualified ecologist appointed to the project.