



Elite Ecology

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Node Court, Codicote



Preliminary Ecological Appraisal

October 2022



01782 308418



Part of Harmil Environmental Ltd
Company Reg Number: 11310919
Company VAT Number: 320559225

www.eliteecology.co.uk
admin@eliteecology.co.uk



Wellesley House, Wellesley St,
Stoke-on-Trent ST1 4NF



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Prepared For	Briffa Phillips Ltd		
Author	Mr. Lewis Simpson		
Approved (1 st Checker)	Mr. Marek Fraczek		
Approved (2 nd Checker)	Mr. Richard Millington		
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0. Executive Summary

This report has been prepared at the request of Briffa Phillips Ltd. It relates to the proposed re-development works at Node Court, Codicote, Hertfordshire, SG4 8TR (OS Grid Reference: TL 22002 19785). This survey effort involved both a desktop study and field survey being undertaken.

Under the current proposals, the plans are for the regeneration of Node Court to provide eight new residential units, the conversion of the Midden into one residential unit, and the construction of three terraced residential units to the south-east of the site.

Hertfordshire Ecological Records Centre (HERC) 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 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 (in habitat code order):

- A2.2 – Scattered Scrub
- A3.1 – Broad-Leaved Scattered Trees
- A3.2 – Coniferous Scattered Trees
- A3.3 – Mixed Scattered Trees
- C3.1 – Tall Ruderal
- G1 – Pond (Standing Water)
- J1.2 – Amenity Grassland
- J1.3 – Short Ephemeral
- J1.4 – Introduced Shrub
- J2.1.2 – Species Poor Intact Hedge
- J2.3.2 – Species Poor Hedge with Trees
- J2.4 – Fence
- J2.5 – Wall
- J2.6 – Dry Ditch
- J3.6 – Building
- J4 – Hard Standing Ground
- J5 – Other Habitats: Brash Pile; Invasive Non-Native Species (INNS)

Designated Sites:

No designated sites that were revealed by the ecological data search provided by HERC fell on or 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.

Habitats:

Priority Habitats: No habitats of conservation concern were located on the site itself. The ponds on site do not reach the required standards to be classified as priority habitat. Therefore, the proposed scheme of works will not impact upon any rare or valuable habitats.

Wildlife Corridors: It is recommended that designated wildlife corridors are incorporated into the design scheme of the site. This will be identified within a soft landscaping plan that will also offer a management strategy that is required to be adhered to. Linear features that enhance the site for a number of species should also be maintained during and after the scheme of works.

Species:

Amphibians: As it is unlikely great crested newts will be using the onsite pond, with the main thrust of the re-development works occurring on hard standing ground or existing buildings, it is deemed that an Amphibian Method Statement is sufficient for the project.

Badgers (*Meles meles*): As the renovation of B1, B2 and B3, and the construction of the new units at Node Court fall within 30m of the main sett, a Badger Mitigation and Method Statement is required to ensure that the works near to the setts do not breach the Protection of Badgers Act. This will include Construction Exclusion Zones to prevent any disturbance.

Bats: From the site survey, it has been established that structure B1 has a **confirmed** brown long-eared (*Plecotus auritus*) bat feeding roost, with other suitable features present to support other potential roosts. Therefore, this structure needs a minimum of three further bat emergence/re-entry surveys, to be carried out between May and September, with at least two of these visits required between June and August. The structure labelled **B2** and **B3** have both been identified as being of **low** bat roosting potential. Therefore, these structures require a minimum of one further bat emergence or re-entry survey, which is required during the optimal months of June to August. Due to all of the crevices and potential roosting features externally and internally, it has been deemed that 34 survey positions are required to cover all features.

Tree **T2** has been identified for removal. Therefore, a Bat Method Statement is required for this process. The tree will be required to be soft felled, limb-by-limb, under the supervision of an appropriately licenced bat ecologist.

On the site itself, no artificial lighting is to be shone on any scattered trees, shrubs, linear features, woodland, or waterways. An artificial lighting plan is required. All lighting must avoid the features of interest for the local bat populations. This is required due to the suitable habitats within the local landscape meaning there is likely to be foraging and commuting bats present in the area.

Birds: Due to the time of year the survey is undertaken, it is recommended that an update breeding bird assessment of the structures on site is undertaken prior to one of the bat emergence or following a bat re-entry survey.

It is recommended that the building works and removal of any trees, hedgerows, scrubland and dense vegetation on site is completed outside the bird breeding season (March to August, inclusive). If this timescale cannot be achieved, the trees are required to be assessed by a suitably qualified ecologist no more than twenty-four hours before works commence to confirm the presence or absence of active nests. If active nests are located, exclusion zones around the nest will be required until the chicks have fledged the nest.

To adequately compensate for the loss of the identified nests, it is recommended that at least:

- 4 x [FSC Blackbird Nest Box](#)
- 2 x [RSPB Robin and Wren Diamond Nest Box](#)

Hedgehogs (*Erinaceus europaeus*): If shrubs and trees are cleared between the 1st November and 31st March, then an inspection by a suitably qualified ecologist is required to ensure no hibernating Hedgehogs (*Erinaceus europaeus*) are present on site. As a precautionary measure, it is recommended that provisions are incorporated during the construction phase. This will be to create provisions for hedgehogs to escape in the form of creating slopes or the inclusion of ramps at the end of each working day from all trenches dug into the ground. Additionally, any pipework left on site that is greater than 150mm in diameter will need to be planked off. Should this information be strictly adhered to, then the development works will not negatively impact on the local hedgehog populations.

Invasive Non-Native Species (INNS): As the proposals are for the regeneration of the site, it is unknown whether the Invasive Non-Native Species (INNS) on site will be retained as an ornamental feature, or whether they are proposed to be removed. If they are to be retained, management must ensure that these species do not escape from the site boundary. This is to prevent the illegal escape of the plants from the site boundary. If the plants are to be removed, an in-depth INNS Removal Plan will be required to ensure the correct protocol is followed. This will include the safe removal of the vegetation.

Reptiles: As many suitable reptile habitats have been identified on site, it is recommended that a full presence/absence survey is undertaken on the site to establish if any hotspot areas are identified. This will enable adequate compensation and mitigation to ensure the specimens identified remain in favourable conservation status. This consists of setting artificial refugia around the site, with these allowed to bed-in for two weeks. Following this, seven separate visits are undertaken to establish presence/absence on site.

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.

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1. Introduction

1.1 Report rationale

This report has been prepared at the request of Briffa Phillips Ltd. It relates to the proposed re-development works at Node Court, Codicote, Hertfordshire, SG4 8TR (OS Grid Reference: TL 22002 19785). 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 6th of October 2022.

Preliminary Roost Assessment:

- **Mr. Richard Millington:** BSc (Hons), ACIEEM, CERPIT, Principal Ecologist, Natural England Bat Survey Licence Number: 2016-26861-CLS-CLS Bat Survey Level 2.
- **Mr. Connor Wild:** MSc, Ecologist, Natural England Bat Survey Licence Number: 2022-10201-CL17-BAT Level 1.

Preliminary Ecological Appraisal:

- **Mr. Matthew Cotterill:** PGDip, BSc (Hons), Ecologist. Natural England Bat Survey Licence Number: 2019-43981-CLS-CLS Level 1.
- **Mr. Peter Royall:** BSc (Hons), Assistant Ecologist.

1.2 Site description and works

The site is located within a semi-rural setting, to the north-east of the large village of Codicote, Hertfordshire.

The site contains a number of habitats and measures approximately 0.9ha. These habitats include amenity grassland, brash piles, dry pond, fences, standing water (pond), scattered trees, introduced shrub, mixed scattered trees, scattered broadleaved trees, scattered coniferous trees, scrubland, short ephemeral, species-poor hedgerows, tall ruderal and walls. The habitats on site could have the potential to support a number of protected species. The photographs of the site are found within **Appendix E**.

Within the wider landscape, further habitats are present. These come in the form of arable land, buildings (and their associated gardens/yards), hedgerows, scattered trees, standing water and woodland. The habitats that surround the site also have the potential to be utilized by a variety of protected species.

Under the current proposals, the plans are for the regeneration of Node Court to provide eight new residential units, the conversion of the Midden into one residential unit, and the construction of three terraced residential units to the south-east of the site.

Figure 1: An aerial map showing the boundary of the site at Node Court, Codicote (as shown by the red outline).



Figure 2: An aerial map showing the boundary of the site at Node Court, Codicote (as shown by the yellow star) in relation to some of the local landscape.

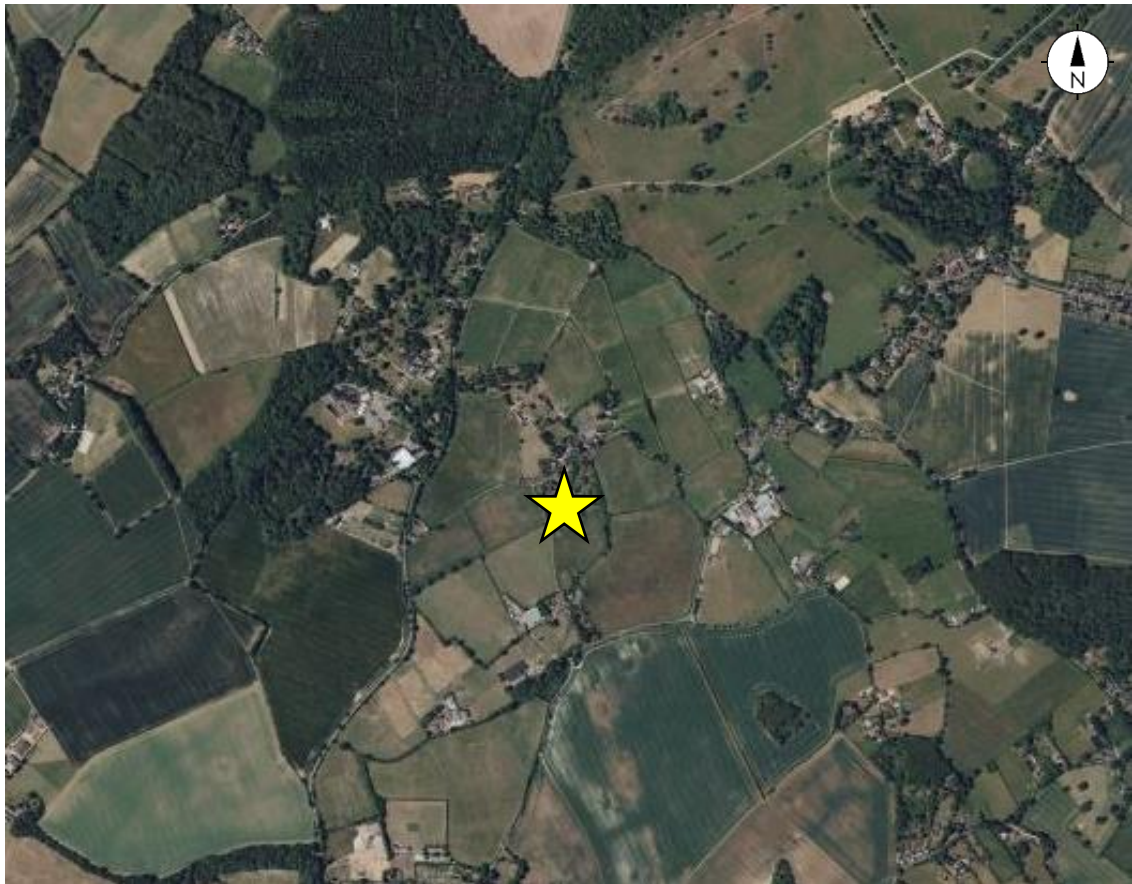
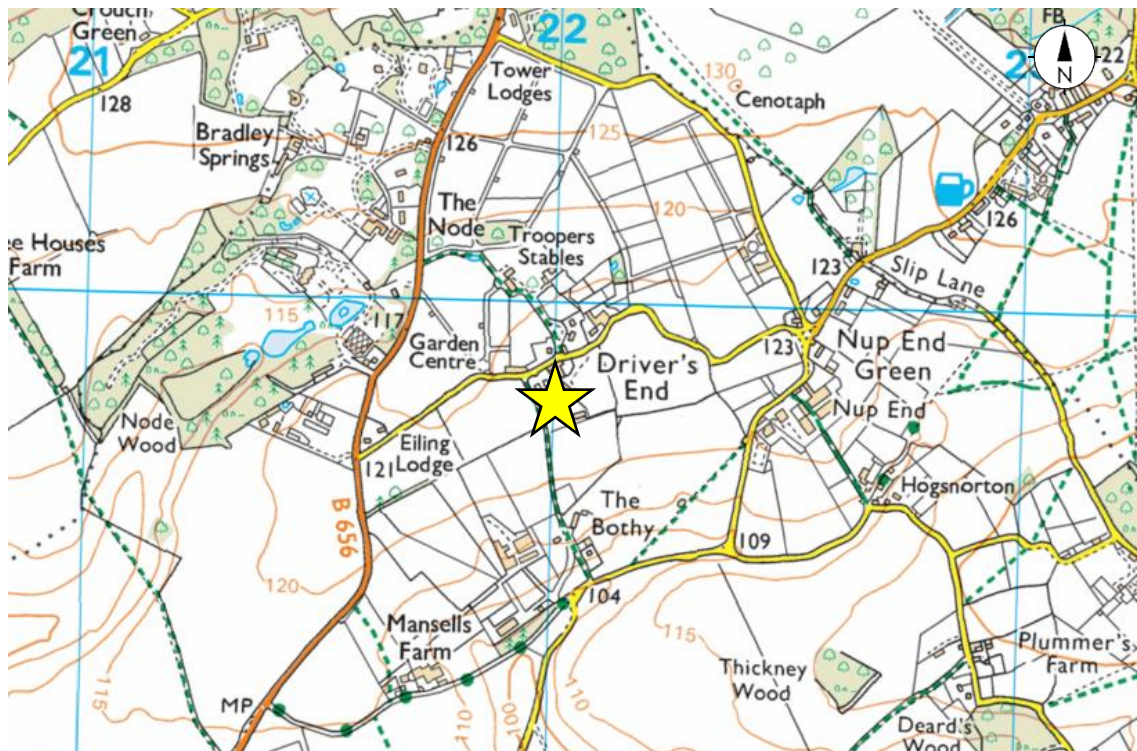


Figure 3: An OS map obtained from Bing showing the location of Node Court, Codicote (yellow star).



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. Hertfordshire Environmental Records Centre (HERC) 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 October 2022, which is outside the optimal time period for flora surveys. However, 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 HERC revealed one statutory protected site (e.g. LNR, SSSI, SPA, SAC or Ramsar) within the 2km radius of the site. This was of a Site of Special Scientific Interest (SSSI), and is as follows:

Site Name	Designation	Approx. Distance (m)	Heading
Knebworth Woods	SSSI	1,170	N

3.2 Non-Statutory Sites

The ecological data received from HERC confirmed the presence of twenty non-statutory protected sites within 2km of the site. These were in the form of Local Wildlife Sites (LWS) and are as follows:

Site Name	Designation	Approx. Distance (m)	Heading
Burleigh Farm	LWS	1,790	N
Burleigh Farm Meadow	LWS	1,820	N
Church Wood	LWS	860	NW
Codicote Lodge Icehouse & Surroundings	LWS	1,580	SW
Copse by Codicote Lodge	LWS	1,430	SW
Crouchgreen Woods	LWS	930	NW
Crouch Green Meadow	LWS	1,130	NW
Graffridge Wood	LWS	940	NW
Graffridge Meadows	LWS	1,500	N
Heath Plantation Main	LWS	1,520	NW
Holl Lays Wood	LWS	1,250	NW
Knebworth Park	LWS	680	N
Meadow N.W. of First Spring	LWS	1,960	SW
New Wood	LWS	1,160	E
Node Wood	LWS	700	W
Park Wood/Home Wood	LWS	1,720	E
Plantations S. part Newton Wood	LWS	1,900	NW
Rusling End Meadow	LWS	1,820	NW
Rusling End Meadow South	LWS	1,640	NW
St Giles Churchyard, Codicote	LWS	990	S

3.3 Woodland Sites

The information provided by HERC revealed four Ancient and Semi-natural Woodland (ASNW) sites within the 2km search radius. They are as follows:

Site Name	Designation	Approx. Distance (m)	Heading
Graffridge/Winter Woods	ASNW	940	NW
Newton/Cannocks Woods	ASNW	1,170	N
Node Wood	ASNW	710	W
Park Wood	ASNW	1,720	E

3.4 **Regionally Important Geological Sites (RIGS)**

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

3.5 **Species Records**

3.5.1 Amphibians

Within the ecological data search provided by HERC, two amphibian species have been identified within 2km of the survey site. These come in the form of common toad (*Bufo bufo*) and great crested newt (*Triturus cristatus*). The closest record to the proposed works site is of common toad located approximately 200m to the north of the site centroid.

3.5.2 Birds

Within the ecological data set received by HERC, eighty-one bird species were revealed. The closest record to the proposed works site is of red kite (*Milvus milvus*) and mandarin duck (*Aix galericulata*) located approximately 500m to the west of the site centroid. A table with the collated bird species recorded can be found within **Appendix B**.

3.5.3 Crustacean

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

3.5.4 Flora

Within the ecological data search provided by HERC, forty-seven floral species have been revealed, of which three are invasive. The closest of the higher plants was small-flowered buttercup (*Ranunculus parviflorus*), which was located approximately 410m to the north-west of the site centroid.

3.5.5 Fungi

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

3.5.6 Invertebrates

Within the ecological data search provided by HERC, 142 records have been identified within a 2km radius of the site. The closest record was of the beetle cercyon impressus (*Cercyon impressus*) which was recorded approximately 1,230m to the north of the site centroid. A table with the collated invertebrate species recorded can be found within **Appendix B**.

3.5.7 Mammals

Bats:

Within the ecological data search provided by HERC, eight species of bat were revealed within the 2km search radius.

The UKBAP species recorded in the search were brown long-eared (*Plecotus auratus*), noctule (*Nyctalus noctula*), soprano pipistrelle (*Pipistrellus pygmaeus*) and western barbastelle (*Barbastella barbastellus*) bats.

The non-BAP species recorded in the search were common pipistrelle (*Pipistrellus pipistrellus*), Daubenton's (*Myotis daubentonii*), Leisler's bat (*Nyctalus leisleri*), Nathusius' pipistrelle (*Pipistrellus nathusii*), Natterer's (*Myotis nattereri*), serotine (*Eptesicus serotinus*) and whiskered (*Myotis mystacinus*) bats.

In addition to this, some records of unidentified bats (*Chiroptera* sp.) specimens were identified.

The closest record to the survey site was of serotine (*Eptesicus serotinus*) found approximately 600m to the north-west of the site centroid.

Other mammals:

Within the ecological data search provided by HERC revealed fourteen other mammals within the 2km search radius. These come in the form of brown hare (*Lepus europaeus*), Chinese muntjac (*Muntiacus reevesi*), eastern grey squirrel (*Sciurus carolinensis*), Eurasian badger (*Meles meles*), Eurasian otter (*Lutra lutra*), Eurasian red squirrel (*Sciurus vulgaris*), Eurasian water shrew (*Neomys fodiens*), European water vole (*Arvicola amphibius*), harvest mouse (*Micromys minutus*), polecat (*Mustela putorius*), sika deer (*Cervus nippon*), stoat (*Mustela erminea*), weasel (*Mustela nivalis*) and west European hedgehog (*Erinaceus europaeus*). The closest record to the proposed site is of eastern grey squirrel located approximately 600m to the north of the site centroid.

3.5.8 Mollusc

Within the ecological data search provided by HERC, one mollusc species was identified within 2km of the survey site. This was a roman snail (*Helix pomatia*) located approximately 2,000m to the south of the site centroid.

3.5.9 Reptiles

Within the ecological data search provided by HERC, four reptile species have been identified within 2km of the survey site. This includes adder (*Vipera berus*), common lizard (*Zootoca vivipara*), grass snake (*Natrix helvetica*) and slow worm (*Anguis fragilis*). The only record with accurate location data was of common lizard, which was recorded 1,920m to the south-east of the site centroid.

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):

On Site:

4.1.1 **A2.2** – Scattered Scrub

Scattered scrub appears in relatively small and widespread patches across the site, and also surrounds most of the dry ditch to the north-east of the site. It is dominated by bramble (*Rubus fruticosus*), with occasional instances of creeping thistle (*Cirsium arvense*). Rare instances of Aaron's beard St. John's Wort (*Hypericum calycinum*) and young ash saplings (*Fraxinus excelsior*) were also found. This habitat is deemed to have **moderate** protected species potential.

4.1.2 **A3.1** – Broad-Leaved Scattered Trees

These scattered trees can be found along the majority of the western border of the site, forming a line of trees. Frequently occurring species include beech (*Fagus sylvatica*), cherry laurel (*Prunus laurocerasus*) – invasive non-native species INNS and hawthorn (*Crataegus monogyna*), with occasional instances of elder (*Sambucus nigra*) and hawthorn (*Crataegus monogyna*). Rarely found species include alder (*Alnus glutinosa*), cockspur hawthorn (*Crataegus crus-galli*), crab apple (*Malus sylvestris*), dogwood (*Cornus sanguinea*), holly (*Ilex aquifolium*), honey locust (*Gleditsia triacanthos*), large-leaf lime (*Tilia platyphyllos*), Norway maple (*Acer platanoides*) and wild cherry (*Prunus avium*). This habitat is deemed to be of **high** protected species potential, despite the frequent presence of cherry laurel (INNS).

A total of five broad-leaved trees were identified to be removed by the scheme of works. Due to this, these trees were inspected for their potential to be utilized by bats for roosting. This is summarised in Table 1 below. Only one tree was identified as having a '**low**' bat roosting potential. The other five trees were found to be of '**negligible**' bat roosting potential. Therefore, further precautionary measures are needed for the tree to be removed.

4.1.3 **A3.2** – Coniferous Scattered Trees

These trees are found in a small section of the site to the south and is dominated by Lawson's cypress (*Chamaecyparis lawsoniana*) and red cedar (*Thuja plicata*), which is non-native conifer. This habitat is deemed to be of **low** protected species potential, as they could support nesting pigeons (*Columba* sp.) or goldcrest (*Regulus regulus*).

A total of one coniferous tree was identified to be removed by the scheme of works. Due to this, the tree was inspected for its potential to be utilized by bats for roosting. This is summarised in Table 1 below. This tree was found to be of '**negligible**' bat roosting potential.

Figure 4: Map showing the locations of the six trees surveyed for bat roosting potential. Trees have been assigned arbitrary names T1 to T6.

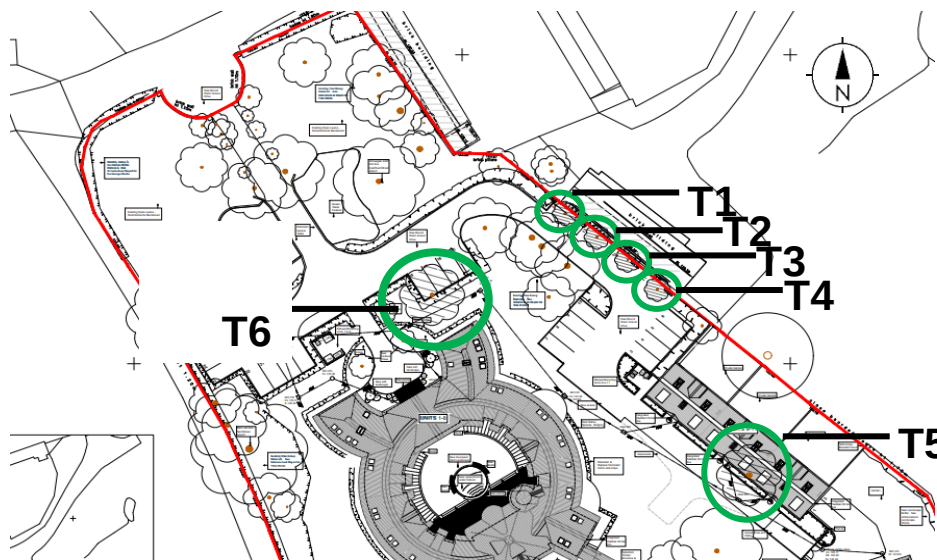


Table 1: The trees proposed for removal.

Tree	Tree Species	Bat Roost Potential
T1	Cockspur Hawthorn (<i>Crataegus crus-galli</i>)	Negligible
T2	Hawthorn (<i>Crataegus monogyna</i>)	Low
T3	Cockspur Hawthorn (<i>Crataegus crus-galli</i>)	Negligible
T4	Hawthorn (<i>Crataegus monogyna</i>)	Negligible
T5	Lawson's cypress (<i>Chamaecyparis lawsoniana</i>)	Negligible
T6	Wild Cherry (<i>Prunus avium</i>)	Negligible

4.1.4 A3.3 – Mixed Scattered Trees

Mixed scattered trees are found scattered throughout the site, concentrating mainly at the north-eastern quadrant. Occasionally occurring species include field maple (*Acer campestre*), Lawson's cypress (*Chamaecyparis lawsoniana*), Leyland cypress (*Cuprocyparis x leylandii*), silver birch (*Betula pendula*) and weeping willow (*Salix babylonica*). Rarely found species are black pine (*Pinus nigra*), dawn redwood (*Metasequoia glyptostroboides*) and Norway maple (*Acer platanoides*). This habitat is deemed to be of only **moderate** protected species potential.

4.1.5 C3.1 – Tall Ruderal

This habitat is found throughout the site, both in small fragments and moderately sized areas. It is dominated by common mallow (*Malva neglecta*) and abundant in common nettle (*Urtica dioica*), with rare instances of round snowberry (*Symphoricarpos orbiculatus*). It is deemed to be of **high** protected species potential.

4.1.6 **G1** – Pond (Standing Water)

A moderately sized pond of approximately 100m² is present at the north of the site, to the west side of a small brick bridge in which the access driveway runs. To the east of the bridge, a dry pond is also present. The bridge appears to be damned, and does not link between the two features. The bank of the pond is lined, but is quite steep due to the brick surround, which may provide difficulty for amphibians to climb out of the water and into the terrestrial habitat. A number of dragonflies were also noted.

A second pond is located in the courtyard. This is a small feature, measuring approximately 20m², with a lot of debris within the waterbody. The pond is completely surrounded by brick walls, and there is very little vegetation present.

This habitat has **low** protected species potential.

4.1.7 **J1.2** – Amenity Grassland

Amenity grassland occupies a large portion of the site and is dominated by common bent (*Agrostis capillaris*), with frequently occurring chickweed (*Stellaria media*) and moss species. Occasionally occurring species include creeping buttercup (*Ranunculus repens*), ragwort (*Jacobaea vulgaris*), spear thistle (*Cirsium vulgare*) and white clover (*Trifolium repens*). Some areas of this grassland is mown, with a short sward height, with some being irregularly mown with a slightly longer sward height. This habitat has poor species diversity and is deemed to be of **low** protected species potential.

4.1.8 **J1.3** – Short Ephemeral

This habitat is present in large areas, particularly at the northern and south-eastern sides of the main building of Node Court. These short ephemeral plants are mostly growing in the hard standing ground which has been left for the past three years, since the last fire. This habitat is frequented by creeping cinquefoil (*Potentilla reptans*), with occasionally occurring bristly ox-tongue (*Helminthotheca echioides*) and dove's foot cranesbill (*Geranium molle*). Rarely seen species include black nightshade (*Solanum americanum*), hawkbit (*Leontodon sp.*), mullein (*Scrophulariaceae sp.*), prickly sowthistle (*Sonchus asper*) and scarlet pimpernel (*Anagallis arvensis*). This habitat is of **low** protected species potential.

4.1.9 **J1.4** – Introduced Shrub

This habitat is found in small areas across the site, often bordered by overgrown tall ruderal. It is dominated by Chinese barberry (*Berberis julianae*), with frequent occurrences of Chinese fleece-vine (*Fallopia aubertii*), and occasional occurrences of hedge bindweed (*Calystegia sepium*) and Japanese mahonia (*Mahonia japonica*). Rarely found species include evergreen spindle (*Euonymus japonicus*), firethorn (*Pyracantha sp.*), pale-leaf barberry (*Berberis candidula*), Mexican orange blossom (*Choisya ternate*), rose (*Rosa sp.*) and willow-leaf hebe (*Hebe salicifolia*). This habitat mainly consists of non-native species and is deemed to be of **low** protected species potential.

4.1.10 **J2.1.2** – Species Poor Intact Hedge

This type of hedge is found at the northern entrance to the site, and also in two sections to the east of the main building of Node Court. It is dominated by Chinese barberry (*Berberis julianae*), with frequent occurrences of beech (*Fagus sylvatica*) and occasional instances of Lawson's cypress (*Chamaecyparis lawsoniana*). It is deemed to be of **moderate** protected species potential.

4.1.11 **J2.3.2** – Species Poor Hedge with Trees

This type of hedge is found bordering the site to the north-west and south-east, and is dominated by Chinese barberry (*Berberis julianae*), whilst being abundant in cherry laurel (*Prunus laurocerasus* [INNS]). Occasionally found species are elder (*Sambucus nigra*), hawthorn (*Crataegus monogyna*) and horse chestnut (*Aesculus hippocastanum*), with the rarely found species being ash (*Fraxinus excelsior*), cotoneaster (*Cotoneaster horizontalis*), dogwood (*Cornus sanguinea*) and holly (*Ilex aquifolium*). This habitat has **moderate** protected species potential.

4.1.12 **J2.4** – Fence

Fence borders a part of the site to the south and does not impair mammal movements into the site. It is a post and wire fence. Along the eastern boundary of the site, another fence is present, which is wooden panelled and has a concrete base. These fences are of no ecological value.

4.1.13 **J2.5** – Wall

Brick walls are found occasionally in and bordering the site, although these do not restrict species movement onto the site. These are also in good condition, with no cracks and crevices present for species to use. The walls themselves are of no ecological significance.

4.1.14 **J2.6** – Dry Ditch

The dry ditch is found to the east of the pond on site, and until recently was a pond until the water was drained or seeped through the substrate. The feature should be reinstated as a pond, but in its current value is deemed to be of **low** protected species potential.

4.1.15 J3.6 – Building

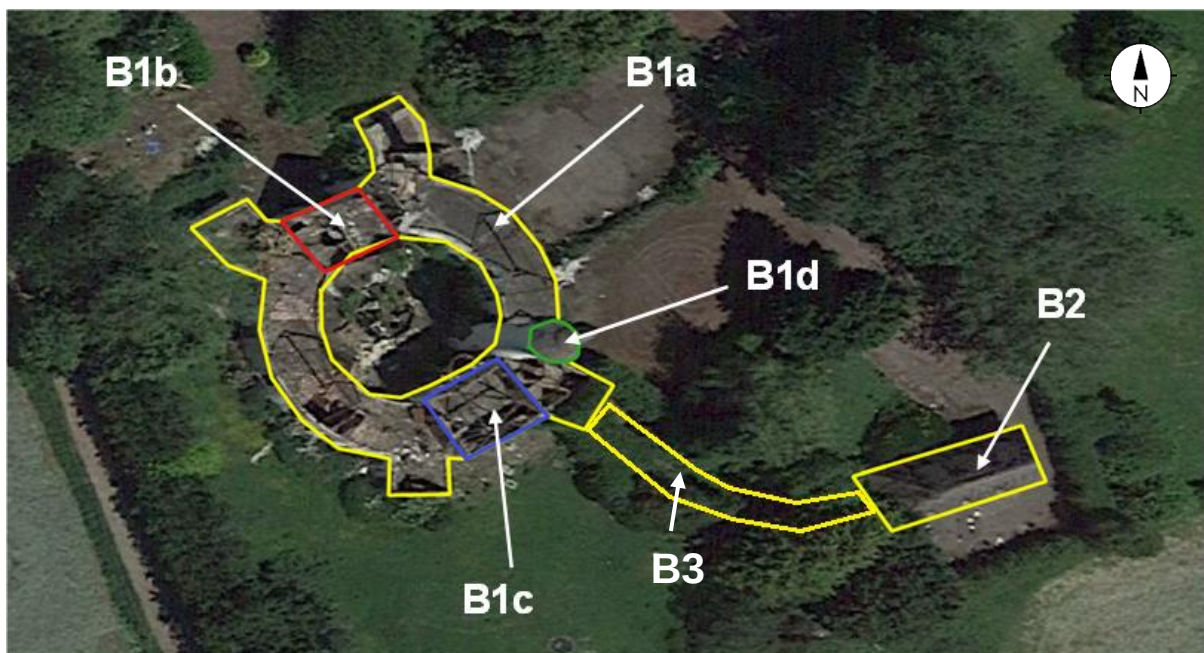
The site has three buildings on site – the main building of Node Court and a reception building.

The main building of Node Court is a Grade II listed twentieth century folly, understood to have been built to represent an idealised dairy farm. Up until 2015, the building was utilised as office space until approximately half of the building was destroyed by fire. **This building has been split up into four separate buildings for simplicity** since it is quite a complex building with several different substructures.

Therefore, the main building (dairy) of node court has been assigned four arbitrary building names of B1a (Ring), B1b (North Gate House), B1c (South Gate House) and B1d (Tower).

The separate midden building has been assigned B2. The walkway is referred to as B3.

Figure 5: An aerial photograph of the two buildings at Node Court, Codicote (as shown by the outlines). Buildings have been assigned arbitrary names and will be referenced throughout the report. For simplicity, the main building of B1 has been split up into 4 separate building designations. B1a is the main ring, B1b is the north gatehouse, B1c is the south gatehouse, B1d is the tower.



Building Descriptions

B1a (Ring)

External Inspection:

The ring is constructed from painted brick walls, with wooden framed doors and windows. The glass within the windows is smashed, allowing for clear access to the interior for bats and birds. The roof around this structure was previously thatched, but has been destroyed by the fire at the property, leaving the building quite exposed. Due to damage, exposed internal walls can be seen on the first floor, with supporting roof steel beams exposed to the elements.

A total of four bird nests were seen from the outside of the building, with three of these being blackbird (*Turdus merula*) and one of them being wren (*Troglodytes troglodytes*) nest.

Internal Inspection:

For large sections of the ring roof, only steel beams remain. The internal of the building features concrete walkways, with the old internal walls either exposed or largely collapsed. Many gaps were seen in the brickwork on the first floor, creating possible roosting and nesting opportunities.

Due to the missing windows and doors, the ground floor is fully accessible for bats and birds. A large amount of vandalism is apparent on site, leading to a lot of disturbance. Due to this, there is a large amount of light entering the structure. However, vast amounts of crevices and gaps within the brickwork, owing to the fire and vandalism, creates ample roosting and nesting opportunities. In a room at the northern corner of the building, one bat dropping was identified on a wall, with evidence of liquid running from the top of the walls (possibly urine stains, or possible water damage). This dropping was attempted to be taken for DNA testing, but due to the one sample being utilised for the "crush" test, these results returned inconclusive. However, a dark room adjacent to this one contained further evidence of bat presence. A large number of feeding remains were evident in the form of moth and butterfly wings, with the species identified being orange underwing (*Archiearis parthenias*), peacock (*Aglais io*), small tortoiseshell (*Aglais urticae*) and yellow underwing (*Noctua pronuba*). Some droppings were also identified within this section, with these being sent for DNA testing.

B1b (North Gate House)

External Inspection:

This gatehouse is constructed of the same materials as seen on the ring. The chimney, however, is reasonably intact, although gaps in the brickwork provide suitable roosting areas for bats. Once again, the vast majority of the roof has been destroyed by the fire, although some remnants of a fire retardant membrane and mesh is present. No evidence of nesting birds was found externally.

Internal Inspection:

This structure has an archway, which is open to the elements, with a stairway to the east leading to the first floor and a room to the west. No evidence of bat or bird presence was noted within this section of the building.

B1c (South House)External Inspection:

This house is constructed of the same materials seen on the ring. No roof is present, and only the structural steel beams, with highly damaged wooden panels surrounding them, remain. Windows are wood framed and smashed. There is also a staircase on the exterior of this section, with evidence of a former chimney. Some of the former internal first floor walls are apparent, with many cracks and crevices present for bats to roost. No evidence of nesting birds was found externally.

Internal Inspection:

Many gaps are present in the internal walls, but some of these are cobwebbed which suggests that they are currently not in use by bats. There are also a couple of chimneys present in this portion of the site, although no evidence was present within this portion. No bat droppings or bird nests were seen inside this part of the building.

B1d (Tower)External Inspection:

The tower is constructed of rendered concrete, with wooden framed windows. Some of the glass is intact, although evidence of smashed glass is apparent. Most of the roof thatch remains, forming a dome shape. Some of this thatch is missing, providing potential access for bats and birds. In addition to this, some gaps that lead into the tower are apparent within gaps in the blockwork.

Internal Inspection:

The internal walls are made from plasterboard, with steel reinforcements to support this. The ceiling is made from plywood (potentially asbestos) and insulation is present. A gap is apparent in the ceiling to see the exposed void space, with natural daylight entering this part of the structure. The roof is made from timber beams and rafters. The ladder to lead to the top of the tower has been vandalised and the safety of this was not risked by the survey team. However, evidence of a corvid nest from within this section has been noted, although this now lies at the base of the ladder. In addition to this, one small tortoiseshell (*Aglais urticae*) wing was identified, providing evidence of feeding bats in this area.

B2 (Midden)External Inspection:

This building is made from painted brick walls, with wooden framed windows and doors. The doors are missing and the glass within the windows has been smashed. The previously thatched roof has been completely destroyed by fire, with only charred timber beams and rafters remnant. There is extensive netting over the roof, but gaps in this netting are present. No evidence of nesting birds were found externally.

Internal Inspection:

The internal walls appear to be constructed from concrete, with many gaps in these bricks present. The building shows large amounts of fire damage. No bat droppings or bird nests were found in this building during the internal inspection.

B3 (Walkway)

External Inspection:

There is a long walkway connecting B1 to B2, which is constructed of timber supports and a pitched thatch roof. The thatched remnants are patchy, and in some areas is completely missing. Vegetation has begun to engulf this structure, and is very dense, providing possible roosting areas for bats.

Internal Inspection:

This structure shows evidence of some burning close to B2, although this does not follow all the way through to B1. There is a large amount of natural daylight within, although as you get closer to B1 the vegetation becomes denser and the structure is sufficiently dark enough to support roosting bats. No direct evidence of bat or bird presence was noted, although there are features that could be utilised by both species.

DNA Results

A small sample of droppings were collected and sent for DNA analysis at EcoWarwicker, based at the University of Warwick. These were split into two samples – the wall and the feeding roost.

The results from the wall sample were inconclusive. This is usually down to one of three factors:

1. DNA degradation of the sample to an extent where it cannot be assessed via PCR technology.
2. The sample may have an unusually high content of inhibiting substances, causing an enzymatic failure.
3. The sample may not be the target species.

Based on the location and the prior knowledge of the building supporting roosting bats prior to the fire, it is thought that this bat dropping returned an inconclusive result due to factor 1.

The results from the assessment of the droppings in the feeding roost revealed that the droppings originated from brown long-eared (*Plecotus auritus*) bats.

The correspondence showing the DNA sequences and results can be found in **Appendix H** at the end of this report.

Please be aware that results from DNA testing reflect the droppings collected. This may not be a true representation of all species using the surveyed site.

Summary of the Building Inspections:

From the initial inspection, it can be confirmed that B1 contains a feeding roost of brown long-eared (*Plecotus auritus*) bats. However, it is unknown as to whether any other roost classifications are present at the site. Therefore, and based upon all evidence collated, the following bat and bird potentials for the buildings have been identified.

Building	Nesting Bird Potential	Bat Roost Potential	Number of bat activity surveys required
B1a	High	Confirmed	3
B1b	Low	Confirmed	3
B1c	Low	Confirmed	3
B1d	High	Confirmed	3
B2	Low	Low	1
B3	Low	Low	1

Table 2: 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.

4.1.14 J4 – Hard Standing Ground

Hard standing ground is found throughout the site in the form of pathways and vehicular access. This habitat is of no ecological significance.

4.1.15 J5 – Target Notes

Brash Pile

Two large piles of brash were found at the north of the site beside the dry pond, and at the southern entrance of the site, near the reception building. These could potentially be used by herpetile species for refugia.

Building Waste

A large pile of building waste is located at the west side of the site. This is not of much ecological significance but reptiles could potentially utilise this for basking and refugia.

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 survey uncovered terrestrial habitats suitable to great crested newts (*Triturus cristatus*) and other amphibians. These habitats are scrubland, tall ruderal, hedgerows, building waste and brush piles.

In addition to this, there is one pond present on site, which was surveyed for its suitability to be utilised by great crested newts (see **Table 2**) using the 'Great Crested Newt Habitat Suitability Index (HSI)' which is a quantitative measure of habitat quality (Source: Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. [2000]).

Table 3: Habitat Suitability Index (HSI) results for the pond located on the site.

Water Body Reference:	Pond 1	Pond 2	Pond 3
Written Reference	Pond by Access Track	Dry Pond	Courtyard
SI1 – Location	1	1	1
SI2 – Pond Area	0.2	0.2	0.01
SI3 – Pond drying	0.9	0.1	0.9
SI4 – Water Quality	0.33	0.01	0.01
SI5 – Shade	1	1	1
SI6 – Fowl	1	1	1
SI7 – Fish	1	1	1
SI8 – Ponds	0.95	0.95	0.95
SI9 – Terrestrial Habitat	0.33	0.33	0.01
SI10 – Macrophytes	0.3	0.3	0.3
HSI Score:	0.60	0.34	0.22
HSI Category	Average	Poor	Poor

Categorisation of HSI Scores

HSI - Water Body Suitability

<0.50	Poor
0.50 – 0.59	Below average
0.60 – 0.69	Average
0.70 – 0.79	Good
>0.80	Excellent

Pond 1 was found to be 'average' in suitability for great crested newts, leading to a 55% chance of occupancy by great crested newts. However, it should be stated that due to the brick wall boundary and lack of macrophyte cover, it is deemed extremely unlikely to support any amphibians in its current condition, and their absence can be assumed. This pond could be enhanced for biodiversity, pending Historic England approval, with these measures recommended in Section 5.4.

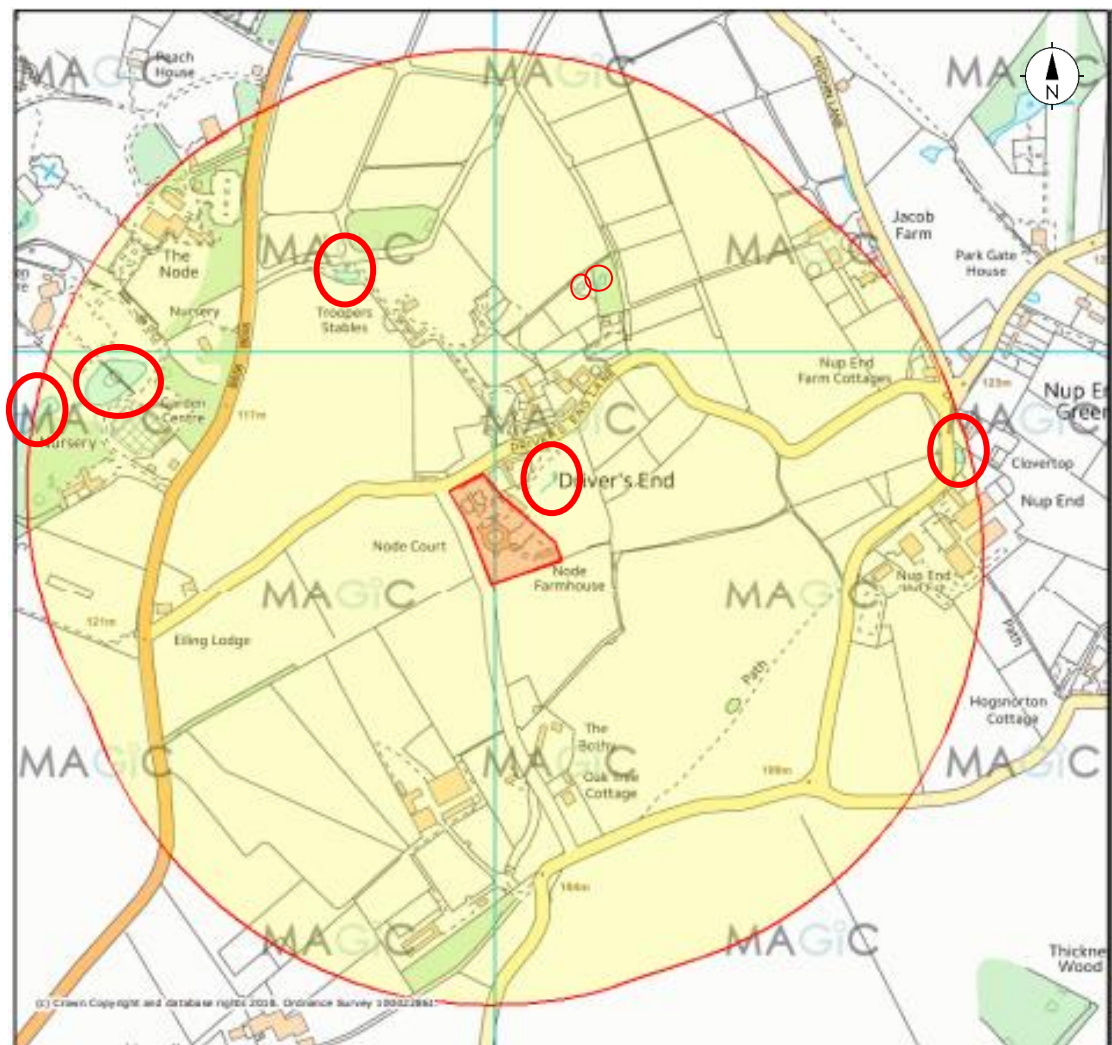
Pond 2 is dry, and has a 'poor' suitability for great crested newts. It should be noted that the pond is likely to be of a similar value to pond 1 when reinstated without any enhancements.

Pond 3 contains 'poor' suitability for great crested newts, and it has been deemed that they will not use this pond due to the brick wall surrounds.

In addition to the ponds on site, seven more ponds are known to be present within a 500m radius of the survey site (please see **Figure 7**).

Due to amphibians being recorded in the local landscape, including great crested newts, further survey effort is required (please see **Section 5.3**).

Figure 7: An OS map obtained from MAGIC showing the locations of seven ponds recorded within 500m of the survey site, circled in red.



4.2.2 Badgers (*Meles meles*)

On site, two badger setts were identified.

The main sett on site is located adjacent to the Walkway (B3), and appears to be active. There are multiple (more than 5) entrance holes, and it appears that this is a former rabbit warren that has been subsequently colonised by the badgers.

The second sett is an outlier sett, probably in relation to the same clan of badgers as the main sett by the Walkway. This consisted of one entrance adjacent to the pond, and appears to be utilised by the local clan.

In addition to the presence of the setts, badger tracks and snuffle holes were identified. Despite this, no latrines were noted by the surveyors.

The current proposals for the renovation of Node Court and the construction of new structures fall sufficiently away from all identified setts. It is anticipated that the renovation will not require the structure to be demolished and rebuilt, with the Walkway also just requiring cosmetic works. The new structures are to be constructed on existing hard standing ground. Therefore, both setts can be retained. However, further recommendations are apparent for this species (please see **Section 5.3**).

4.2.3 Bats

The habitats on site are likely to support foraging, commuting and socialising bats, largely due to the habitats present on site. The hedgerows and tree lines provide good commuting habitat, and the pond, scattered trees, hedgerow, scrubland and tall ruderal habitats provide good foraging opportunities. Overall, the site has **high** potential to support foraging and commuting bats, as evidenced by the confirmation of a brown long-eared (*Plecotus auritus*) feeding roost within B1. However, due to the retention of the habitats within the scheme of works, no further survey work is required. Further precautionary measures are recommended (please see **Section 5.3**).

The buildings on site were deemed to be of varying bat roosting potential. **B1** is **confirmed** to support a feeding roost of brown long-eared (*Plecotus auritus*) bats, with many additional features present to support additional bat roosts. In addition to this, **B2** and **B3** also contain some features in which bats could utilise to roost and has been identified as being of **low** bat roosting potential. Therefore, further survey effort is required (please see **Section 5.3**).

Finally, six trees are proposed to be removed. **T1, T3, T4, T5** and **T6** were deemed to be of negligible bat roosting potential, with no suitable roosting features present. **T2** was deemed to be of **low** bat roosting potential due to the presence of ivy on the trunk. Therefore, further recommendations are apparent for **T2** (please see **Section 5.3**).

4.2.4 Birds

The habitats on site have a **high** potential to support breeding birds, with evidence of nesting confirmed within the buildings. In addition to this, it is highly likely that birds will be nesting within the hedgerows and scattered trees on site. Due to this, further precautionary measures are required for the site, with these outlined in **Section 5.3** of this report.

4.2.5 Crustaceans

The site does have habitats that can support crustaceans. However, these are isolated and are not within the proximity of being flooded. Therefore, the colonisation of the aquatic habitats by crustaceans nearby is not likely. Due to this, their absence can be confirmed on site, with no further action required.

4.2.6 Fish

Although aquatic habitats are present on site, these are ornamental features at present. They are not likely to support any rare or protected fish. The pond, at the time of the survey, also contained no ornamental fish. This will be due to the property being in a derelict condition, and any ornamental fish that may have been present dying.

4.2.7 Flora

The site contains no protected or rare floral species. The habitats are not considered likely to support any protected or rare floral species, with no additional survey work required to ascertain the impacts of the works to flora.

Despite this, evidence of Invasive Non-Native Species are present on site, and further recommendations are apparent for this (please see **Section 5.3**).

4.2.8 Hazel Dormice

No records of hazel dormice (*Muscardinus avellanarius*) were seen within the ecological data search provided by HERC.

During the site survey, no evidence was found, but due to a lack of sustained, regular management, the on-site habitats do provide sufficient cover to sustain a dormouse population. In addition to this, the site is moderately connected to the wider landscape, although it is unknown as to whether this provide continuous canopy cover. There are potentially suitable dormice habitats nearby, such as the ancient woodland of Node Wood approximately 700m to the west.

However, under the current proposals, most of the hedgerows and trees are to be retained in the scheme of works, and returned back to the management they presumably received prior to the fire in 2019. Therefore, no further action is required as impacts are deemed to be **negligible** to this species.

4.2.9 Hedgehogs (*Erinaceus europaeus*)

The site has suitable hibernation habitats for hedgehogs in the form of hedgerows, brash pile and mature scattered trees. The site also offers plenty of foraging habitat and is therefore deemed to be of **high** potential to support hedgehogs. Therefore, further precautionary measures are required for the survey site (please see **Section 5.3**).

4.2.10 Invertebrates

Aquatic Invertebrates

The site contains suitable habitats for aquatic invertebrates, and it is possible that some rare or protected species could be present. However, the proposals will not remove the existing aquatic habitats, whilst also reinstating the dry pond, providing additional habitats. The works will only enhance the site for aquatic invertebrates.

Terrestrial Invertebrates

The site has the potential to support a number of terrestrial invertebrates. However, it is not expected that the proposed works will be of any detriment to rare invertebrates that may inhabit the site.

Summary

It is deemed that no invertebrate survey work is required.

4.2.11 Otters

There are suitable habitats on site that could support any local otter (*Lutra lutra*) populations. However, the site has a lot of anthropogenic disturbance, with no food source present. Therefore, it can be concluded that otters will not be present at the site, with no further survey work required.

4.2.12 Reptiles

The site has a **high** potential to support reptiles, due to suitable habitat such as brash pile, tall ruderal, and scrub. There is also plenty of open areas to allow reptiles to bask. Further precautionary measures are required.

4.2.13 Water Voles

There are suitable habitats on site that could support any local water vole (*Arvicola amphibious*) populations. However, the site has a lot of anthropogenic disturbance, with no food source present. Therefore, it can be concluded that otters will not be present at the site, with no further survey work required.

4.2.14 Other Species

During the site survey, two other species were noted by surveyors.

Fox

The site is likely to support the local fox (*Vulpes vulpes*) population, with a large amount of prey on site. It could be possible that the fox will also have a den on site, although this was not confirmed from this site survey.

Rabbits

The site contains a number of rabbit (*Oryctolagus cuniculus*) warrens. Albeit this species is not legally protected, their presence should be noted from an animal welfare perspective.

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 – **Unknown**
- Badgers – **High**
- Bats – **Unknown**
- Birds – **High**
- Crustaceans – **Negligible**
- Fish – **Negligible**
- Flora – **Negligible**
- Fox – **Low**
- Hazel Dormice – **Negligible**
- Hedgehogs – **High**
- Invertebrates – **Low**
- Otter – **Negligible**
- Rabbit – **Moderate**
- Reptiles – **High**
- Water Vole – **Negligible**

5. Recommendations

5.1 Designated Sites

No designated sites that were revealed by the ecological data search provided by HERC fell on or 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

5.2.1 Priority Habitats

No habitats of conservation concern were located on the site itself. The ponds on site do not reach the required standards to be classified as priority habitat. Therefore, the proposed scheme of works will not impact upon any rare or valuable habitats.

5.2.2 Wildlife Corridors

It is recommended that designated wildlife corridors are incorporated into the design scheme of the site. This will be identified within a soft landscaping plan that will also offer a management strategy that is required to be adhered to. Linear features that enhance the site for a number of species should also be maintained during and after the scheme of works.

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

There is a suitable waterbody located on site, which could support amphibians during their aquatic phase. However, there is a distinct lack of vegetation within the waterbody, with the boundary making it extremely difficult for amphibians to escape should they enter the pond. There is also some terrestrial habitat on site that could support the local amphibian populations.

As it is unlikely great crested newts will be using the onsite pond, with the main thrust of the re-development works occurring on hard standing ground or existing buildings, it is deemed that an Amphibian Method Statement is sufficient for the project.

Should the plans change, or the location of the new structures alter, a reassessment of this recommendation will be required.

5.3.2 Badgers (*Meles meles*)

There are two active badger setts on site, one main sett and one outlier sett. The current proposals for the renovation of Node Court and the construction of new structures fall nearby to the identified setts. It is anticipated that the renovation will not require the structure to be demolished and rebuilt, with the Walkway also just requiring cosmetic works. The new structures are to be constructed on existing hard standing ground. Therefore, both setts can be retained.

As the renovation of B1, B2 and B3 and the construction of the new units at Node Court fall within 30m of the main sett, a Badger Mitigation and Method Statement is required to ensure that the works near to the setts do not breach the Protection of Badgers Act. This will include Construction Exclusion Zones to prevent any disturbance.

The renovation of B1 falls approximately 12m from the Main sett and 35m from the outlier sett. It is anticipated that the building will be renovated, with no new ground penetrating works being undertaken.

The renovation of B2 falls approximately 15m from the main sett and 107m from the outlier sett. Once again, it is anticipated that the building works will involve the renovation of the existing structure, with no new ground penetrating works.

The renovation of B3 falls adjacent to the main sett and approximately 90m from the outlier sett. This feature already exists, with no new ground penetrating works to be undertaken. The roof of the walkway will need work, and it is recommended that works on this structure are undertaken following a watching brief by a suitably qualified ecologist.

The proposed new units are located approximately 20m away from the main sett and 85m from the outlier sett. These works are anticipated to include some ground penetrating works. The sett is very compact, with it not likely to extend into the location of the proposed new units. Due to the proximity of the sett, it is necessary to dig the foundations by hand, to prevent any disturbance to the clan within the setts. This, as with the works on B3, should be undertaken following a watching brief by a suitably qualified ecologist.

It should be worth noting that should building methods or proposals change, a Natural England Licence may be required to facilitate the works.

5.3.3 Bats

From the site survey, it has been established that structure B1 has a **confirmed** brown long-eared (*Plecotus auritus*) bat feeding roost, with other suitable features present to support other potential roosts. Therefore, this structure needs a minimum of three further bat emergence/re-entry surveys, to be carried out between May and September, with at least two of these visits required between June and August.

The structure labelled **B2** and **B3** have both been identified as being of **low** bat roosting potential. Therefore, these structures require a minimum of one further bat emergence or re-entry survey, which is required during the optimal months of June to August.

Due to all of the crevices and potential roosting features externally and internally, it has been deemed that 34 survey positions are required to cover all features.

Tree **T2** has been identified for removal. Therefore, a Bat Method Statement is required for this process. The tree will be required to be soft felled, limb-by-limb, under the supervision of an appropriately licenced bat ecologist.

On the site itself, no artificial lighting is to be shone on any scattered trees, shrubs, linear features, woodland, or waterways. An artificial lighting plan is required. All lighting must avoid the features of interest for the local bat populations. This is required due to the suitable habitats within the local landscape meaning there is likely to be foraging and commuting bats present in the area.

5.3.4 Birds

Due to the time of year the survey is undertaken, it is recommended that an update breeding bird assessment of the structures on site is undertaken prior to one of the bat emergence or following a bat re-entry survey.

It is recommended that the removal of any trees, hedgerows, scrubland and dense vegetation on site is completed outside the bird breeding season (March to August, inclusive). If this timescale cannot be achieved, the trees are required to be assessed by a suitably qualified ecologist no more than twenty-four hours before works commence to confirm the presence or absence of active nests. If active nests are located, exclusion zones around the nest will be required until the chicks have fledged the nest.

All building works upon B1 will need to also avoid the bird breeding season (March to August, inclusive). If this timescale cannot be achieved, the trees are required to be assessed by a suitably qualified ecologist no more than twenty-four hours before works commence to confirm the presence or absence of active nests. If active nests are located, exclusion zones around the nest will be required until the chicks have fledged the nest.

To adequately compensate for the loss of the identified nests, it is recommended that at least:

- 4 x [FSC Blackbird Nest Box](#)
- 2 x [RSPB Robin and Wren Diamond Nest Box](#)

5.3.5 Hedgehogs (*Erinaceus europaeus*)

If shrubs and trees are cleared between the 1st November and 31st March, then an inspection by a suitably qualified ecologist is required to ensure no hibernating Hedgehogs (*Erinaceus europaeus*) are present on site.

As a precautionary measure, it is recommended that provisions are incorporated during the construction phase. This will be to create provisions for hedgehogs to escape in the form of creating slopes or the inclusion of ramps at the end of each working day from all trenches dug into the ground. Additionally, any pipework left on site that is greater than 150mm in diameter will need to be planked off. Should this information be strictly adhered to, then the development works will not negatively impact on the local hedgehog populations.

Precautions should be in place to avoid accidental killing/injury of this species, and measures should be incorporated into the development to maintain/enhance the value of the site:

- Contractors made aware of the potential presence of hedgehogs.
- Vegetation clearance to be carried out by hand, slowly and methodically, particularly any areas of scrub.
- Should any hedgehogs be discovered onsite, they should be picked up (with a gloved hand) and relocated offsite, away from the working areas. They should be placed under a hedgerow/vegetation.

5.3.5 Invasive Non-Native Species (INNS)

As the proposals are for the regeneration of the site, it is unknown whether the Invasive Non-Native Species (INNS) on site will be retained as an ornamental feature, or whether they are proposed to be removed.

If they are to be retained, management must ensure that these species do not escape from the site boundary. This is to prevent the illegal escape of the plants from the site boundary.

If the plants are to be removed, an in-depth INNS Removal Plan will be required to ensure the correct protocol is followed. This will include the safe removal of the vegetation.

5.3.6 Reptiles

The site itself is considered to contain the potential to support local reptilian populations. Due to the potential impacts being incurred during the construction phase, in particular the removal of scrub, tall ruderal and brash habitats, reptile presence/absence surveys will need to be undertaken.

As many suitable reptile habitats have been identified on site, it is recommended that a full presence/absence survey is undertaken on the site to establish if any hotspot areas are identified. This will enable adequate compensation and mitigation to ensure the specimens identified remain in favourable conservation status. This consists of setting artificial refugia around the site, with these allowed to bed-in for two weeks. Following this, seven separate visits are undertaken to establish presence/absence on site.

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 Amphibians

The enhancement of the pond on site offers an excellent opportunity to enhance the site for not only amphibians, but also invertebrates and consequently other species higher in the trophic levels.

Due to the steep gradient of the pond bank, it is recommended that this is reduced. It is imperative that the reprofiling of the pond bank would need to retain the existing shape of the pond. This is imperative to enhance the pond for wildlife. As this falls within the curtilage of a Grade II Listed Building, Elite Ecology have reached out to Historic England to discuss the viability of the scheme. At the time of writing this report, no response had been received.

The ponds should follow the Natural England Great Crested Newt Mitigation Guidelines and will need to adhere to the following criteria:

- The ponds should be created with a basin shape and the depth should be approximately 2m at the deepest point. They should also be lined with either clay or a pond liner.
- The south side of the ponds needs to be clear of vegetation to prevent over shading.
- No ornamental fish should be placed into any wildlife ponds created.
- Additional aquatic plant species outlined in **Figure 8** could be introduced
- The banks of the pond should not be too steep, to allow the amphibians to climb out into the terrestrial habitat.

In addition, at least five hibernacula could be included into the design scheme. These are usually comprised of rubble, rock, log piles and earth banks. An example design for the hibernacula can be seen within **Figure 9**. These should be placed in suitable connected areas near the pond.

Figure 8: A diagram that illustrates how the pond could be enhanced and the habitats included within the aquatic features.

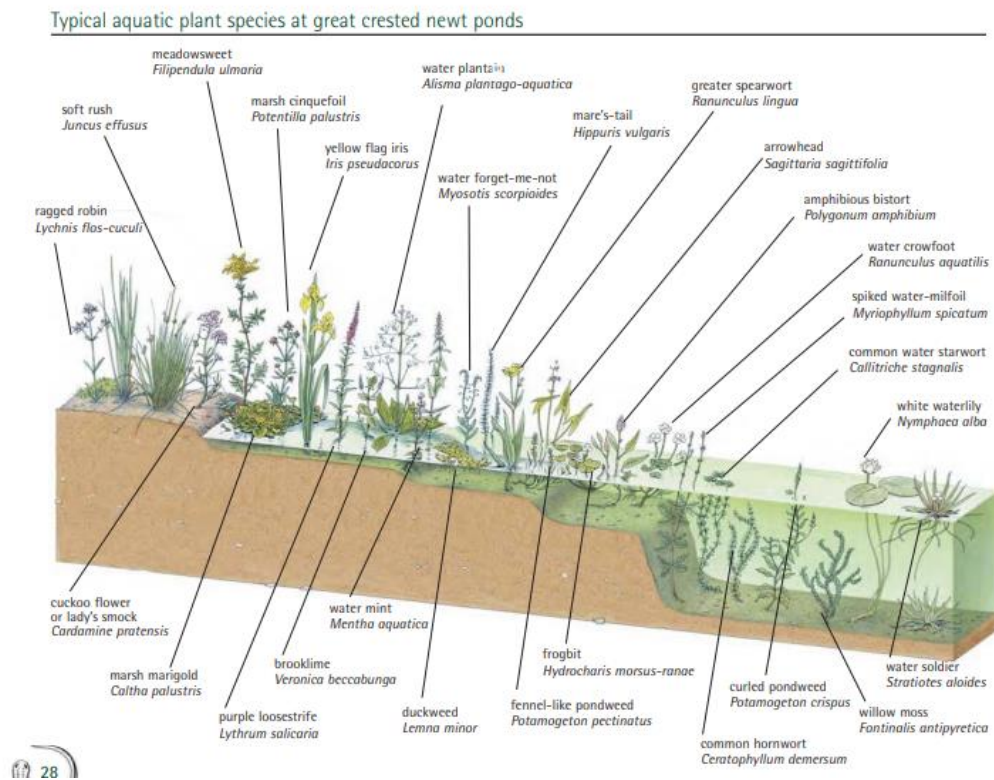
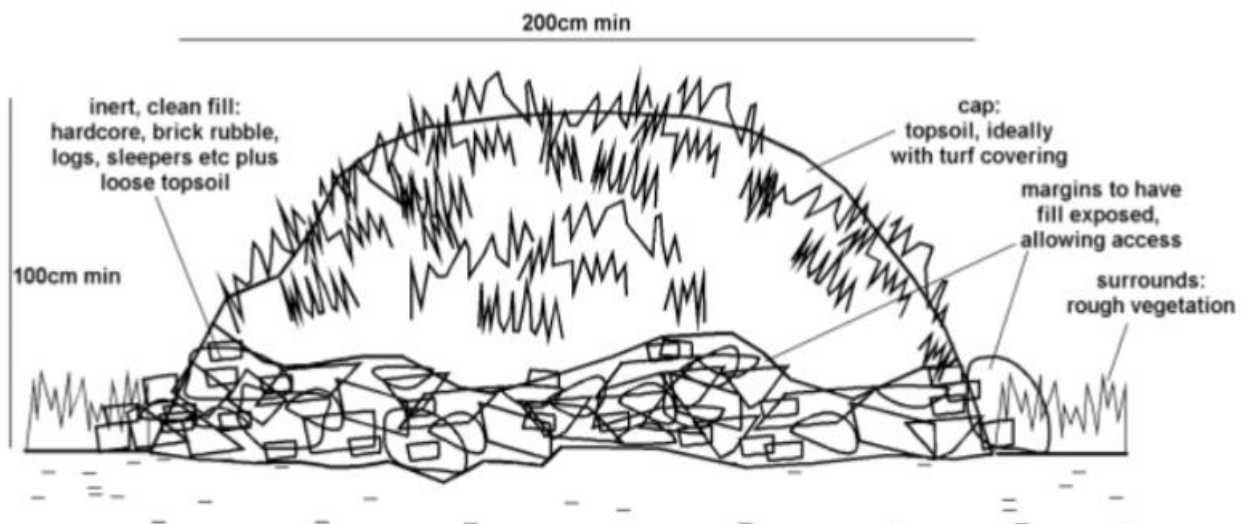


Figure 9: A diagram illustrating the recommended hibernacula (GCN Mitigation Guidelines).



5.4.2 Bats

It is recommended to install at least four [Eco Bat Boxes](#) or [Integrated Eco Bat Boxes](#) on the proposed structures located on site. This will enhance the roosting opportunities within the area for the local bat populations. Alternatively, [Bat Access Tiles](#) could be incorporated into the roof of the new proposed dwellings.

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

Additional compensation, enhancement and mitigation measures will be devised following the additional survey effort.

5.4.3 Birds

The site could be enhanced for birds by installing a variety of [bird boxes](#) on site, such as an [Apex Bird Box](#) and an [Apex Robin Box](#). Different bird boxes are suitable for different species and are all installed in different locations. The locations of which should be devised within a Biodiversity Net Gain plan for the site.

5.4.4 Flora

At present, the site is not considered to have a diverse range of native flora. Therefore, it is recommended that a small section of the site is converted into a 'wild meadow' that uses native wildflower seed mixes. A variety of these can be found on the [Meadowmania](#) or [Wildflower Turf](#) webpages.

To enhance the site for the local bat and bird populations several native shrubs and herbs could be included within the 'wild meadow' which will provide excellent foraging habitat. More information on shrubs for bats can be found on the [Wildlife Trust website](#) and more information on shrubs for birds can be found on the [RSPB website](#). There are several different shrubs to choose from but it is important to avoid invasive species such as buddleia, more information on invasive flora can be found on the [RSPB website](#).

5.4.5 Hedgehogs (*Erinaceus europaeus*)

The site could be enhanced for the local hedgehog population by installing at least two [Eco Hedgehog Nest Boxes](#) around the site. This will create more opportunities for hedgehogs within the local landscape.

5.4.6 Hedgerows

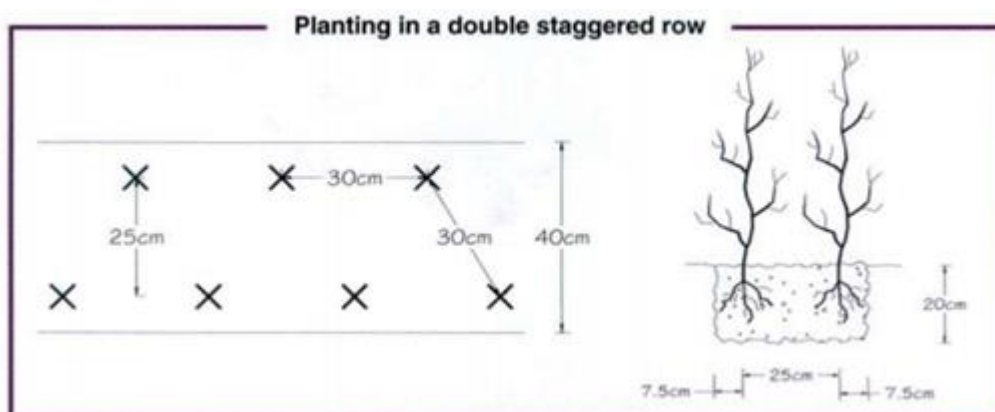
The current proposals include the retention of the cherry laurel (*Prunus laurocerasus*) hedges present on site. It is recommended that these are replaced with native hedges, as cherry laurel is an invasive non-native species (INNS) due to its rapid growth, coupled with its evergreen habit and its tolerance of drought and shade. This often allows it to out-compete and kill off native plant species and reduced the ecological value of the site. If an evergreen hedge is necessary, a yew hedge, which are also included in the site proposals, could be planted instead.

The following is a design scheme of a hedge that will provide greatest ecological value which could be incorporated into the site.

The borders of the site post-development could be enhanced with species rich native hedging consisting of at least five different native species to improve connectivity for the site. It is an option to create traditional hedgerows consisting: 50% hawthorn (*Crataegus monogyna*), 25% blackthorn (*Prunus spinosa*), 15% field maple (*Acer campestre*), 2% holly (*Ilex aquifolium*), 2% wild privet (*Ligustrum vulgare*), 2% guelder rose (*Viburnum opulus*), 2% dog rose (*Rosa canina*) and 2% buckthorn (*Rhamnus frangula*).

Hedgerows can be planted at either 3 plants per meter planted at 33cm intervals or at 5 plants per metre in a staggered double row, with 33cm between each plant along the row and 40cm between the rows.

Figure 10: Planting a double Staggered hedge, taken from Planting a Native Hedgerow, by Wycombe District Council 2008



Further recommendations on the hedge include the way it should be managed:

Year 1-5

- Weed around the base of the shrub to prevent competition
- In late summer any shrubs that have died should be replaced in the Autumn
- In the shrub's first spring cut the hedge down to 45-60cm off the ground to promote a thicker hedge

Year 6-30

Leaving a wild, undisturbed margin adjacent to the hedgerow, ideally 2m will encourage growth around the base of the hedge, providing cover for small mammals and nesting sites for birds.

Hedgerow tops should be cut by chainsaw and **never** flailed as this can severely damage and impede the growth of a hedge after repeated cuts. The hedge must not be cut must not be cut under 2 meters in height.

5.4.7 Invertebrates

At present, the site is considered to be of moderate importance to local invertebrate populations. In conjunction with the pond restoration and wildflower planting, it is recommended that at least two [Bumblebee Boxes](#) are incorporated into the scheme, along with at least two [Bug Hotels](#). This will enhance the site for the local invertebrate populations, which will thus attract species further up in the trophic level. The site would benefit from plants rich in a pollen source throughout the year to enhance the area for the potential of bees. In order to ensure a nectar source year-round it is important to use plants that are relevant to the season. The table below includes just a few examples of which plants thrive through the different seasons to ensure a bee friendly area.

SPRING	SUMMER	AUTUMN	WINTER
• Flowering Cherry • Crab Apple • Hawthorn • Bugle • Daffodils • Pulmonaria • Sea Thrift • Alliums • Grape Hyacinth	• Lavender • Agastache • <i>Erysimum</i> 'Bowles' • Scabious • Comfrey • Foxgloves • Cardoon • Echinops	• Sedums • Single-flowered Dahlias • <i>Verbena bonariensis</i> • Japanese Anemones • Autumn Asters • <i>Actaea simplex</i>	• Snowdrops • Winter Aconites • Ivy • Crocuses • Winter Honeysuckle • Hellebores • Mahonia • <i>Clematis cirrhosa</i>

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.

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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

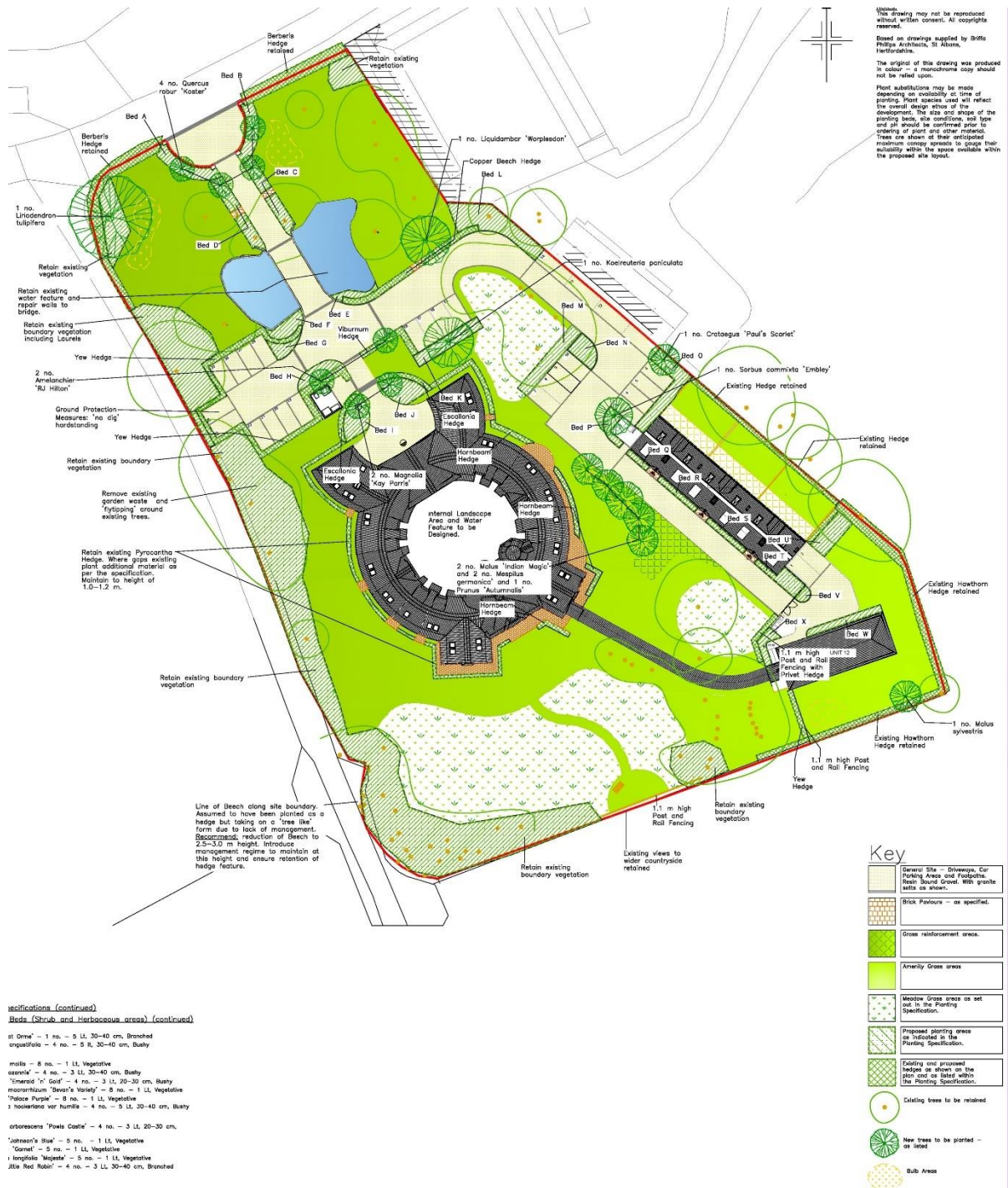
Appendix F: Biodiversity Legislation and Policy

Appendix G: Bat and Artificial Light

Appendix H: The Annual Bat Year (BCT)

Appendix I: Bat DNA Results

Appendix A: Site Plans



Appendix B: Desktop Study Tables

The results within the following table are a collation of the species identified within the desktop search, undertaken by Hertfordshire Ecological Records Centre (HERC).

Amphibians	
Common Name	Latin Name
Common Toad	<i>Bufo bufo</i>
Great Crested Newt	<i>Triturus cristatus</i>
Birds	
Common Name	Latin Name
Barn Owl	<i>Tyto alba</i>
Black Redstart	<i>Phoenicurus ochruros</i>
Black-headed Gull	<i>Chroicocephalus ridibundus</i>
Blue Tit	<i>Cyanistes caeruleus</i>
Brambling	<i>Fringilla montifringilla</i>
Bullfinch	<i>Pyrrhula pyrrhula</i>
Buzzard	<i>Buteo buteo</i>
Canada Goose	<i>Branta canadensis</i>
Caspian Gull	<i>Larus cachinnans</i>
Cetti's Warbler	<i>Cettia cetti</i>
Coal Tit	<i>Parus ater</i>
Common Gull	<i>Larus canus</i>
Corn Bunting	<i>Emberiza calandra</i>
Crossbill	<i>Loxia curvirostra</i>
Cuckoo	<i>Cuculus canorus</i>
Dunnock	<i>Prunella modularis</i>
Egyptian Goose	<i>Alopochen aegyptiaca</i>
Fieldfare	<i>Turdus pilaris</i>
Firecrest	<i>Regulus ignicapilla</i>
Gadwall	<i>Mareca strepera</i>
Goldcrest	<i>Regulus regulus</i>
Goldfinch	<i>Carduelis carduelis</i>
Great Spotted Woodpecker	<i>Dendrocopos major</i>
Great Tit	<i>Parus major</i>
Green Sandpiper	<i>Tringa ochropus</i>
Green Woodpecker	<i>Picus viridis</i>
Greenfinch	<i>Chloris chloris</i>
Grey Heron	<i>Ardea cinerea</i>
Grey Partridge	<i>Perdix perdix</i>
Grey Wagtail	<i>Motacilla cinerea</i>

Greylag Goose	<i>Anser anser</i>
Hawfinch	<i>Coccothraustes coccothraustes</i>
Herring Gull	<i>Larus argentatus</i>
Hobby	<i>Falco subbuteo</i>
House Martin	<i>Delichon urbicum</i>
House Sparrow	<i>Passer domesticus</i>
Kestrel	<i>Falco tinnunculus</i>
Lapwing	<i>Vanellus vanellus</i>
Lesser Redpoll	<i>Acanthis cabaret</i>
Lesser Spotted Woodpecker	<i>Dryobates minor</i>
Linnet	<i>Linaria cannabina</i>
Little Egret	<i>Egretta garzetta</i>
Little Owl	<i>Athene noctua</i>
Mallard	<i>Anas platyrhynchos</i>
Mandarin Duck	<i>Aix galericulata</i>
Marsh Tit	<i>Poecile palustris</i>
Meadow Pipit	<i>Anthus pratensis</i>
Mistle Thrush	<i>Turdus viscivorus</i>
Moorhen	<i>Gallinula chloropus</i>
Mute Swan	<i>Cygnus olor</i>
Nuthatch	<i>Sitta europaea</i>
Pied Wagtail	<i>Motacilla alba yarrellii</i>
Pochard	<i>Aythya ferina</i>
Red Kite	<i>Milvus milvus</i>
Redwing	<i>Turdus iliacus</i>
Ring-necked Parakeet	<i>Psittacula krameri</i>
Robin	<i>Erithacus rubecula</i>
Shoveler	<i>Spatula clypeata</i>
Siskin	<i>Spinus spinus</i>
Skylark	<i>Alauda arvensis</i>
Song Thrush	<i>Turdus philomelos</i>
Sparrowhawk	<i>Accipiter nisus</i>
Spotted Flycatcher	<i>Muscicapa striata</i>
Starling	<i>Sturnus vulgaris</i>
Stock Dove	<i>Columba oenas</i>
Stonechat	<i>Saxicola rubicola</i>
Stone-curlew	<i>Burhinus oedicephalus</i>
Swallow	<i>Hirundo rustica</i>
Swift	<i>Apus apus</i>
Tawny Owl	<i>Strix aluco</i>
Teal	<i>Anas crecca</i>
Treecreeper	<i>Certhia familiaris</i>
Tufted Duck	<i>Aythya fuligula</i>
Turtle Dove	<i>Streptopelia turtur</i>
Waxwing	<i>Bombycilla garrulus</i>

Wheatear	<i>Oenanthe oenanthe</i>
Willow Warbler	<i>Phylloscopus trochilus</i>
Woodcock	<i>Scolopax rusticola</i>
Wren	<i>Troglodytes troglodytes</i>
Yellow Wagtail	<i>Motacilla flava</i>
Yellowhammer	<i>Emberiza citrinella</i>
Flora	
Common Name	Latin Name
Autumn Hawkweed	<i>Hieracium sabaudum</i>
Bladder-sedge	<i>Carex vesicaria</i>
Bluebell	<i>Hyacinthoides non-scripta</i>
Box	<i>Buxus sempervirens</i>
Copse-bindweed	<i>Fallopia dumetorum</i>
Corn Mint	<i>Mentha arvensis</i>
Cornflower	<i>Centaurea cyanus</i>
Devil's-bit Scabious	<i>Succisa pratensis</i>
Dwarf Spurge	<i>Euphorbia exigua</i>
Few-flowered Garlic	<i>Allium paradoxum</i>
Field Scabious	<i>Knautia arvensis</i>
Fringed Water-lily	<i>Nymphoides peltata</i>
Green-winged Orchid	<i>Anacamptis morio</i>
Harebell	<i>Campanula rotundifolia</i>
Heath Speedwell	<i>Veronica officinalis</i>
Himalayan Balsam	<i>Impatiens glandulifera</i>
Hoary Cinquefoil	<i>Potentilla argentea</i>
Hoary Plantain	<i>Plantago media</i>
Jacob's-ladder	<i>Polemonium caeruleum</i>
Japanese Knotweed	<i>Fallopia japonica</i>
<i>Lamiastrum galeobdolon</i> subsp. <i>argentatum</i>	<i>Lamiastrum galeobdolon</i> subsp. <i>argentatum</i>
Large Bitter-cress	<i>Cardamine amara</i>
Lesser Calamint	<i>Clinopodium calamintha</i>
Lesser Spearwort	<i>Ranunculus flammula</i>
Lousewort	<i>Pedicularis sylvatica</i>
Marsh Speedwell	<i>Veronica scutellata</i>
Mousetail	<i>Myosurus minimus</i>
Orpine	<i>Sedum telephium</i>
Quaking-grass	<i>Briza media</i>
Ragged-Robin	<i>Silene flos-cuculi</i>
Red Hemp-nettle	<i>Galeopsis angustifolia</i>
<i>Rhododendron ponticum</i>	<i>Rhododendron ponticum</i>
Royal Fern	<i>Osmunda regalis</i>
<i>Rubus angloserpens</i>	<i>Rubus angloserpens</i>

Rubus proietus	<i>Rubus proietus</i>
Rubus scaber	<i>Rubus scaber</i>
Sanicle	<i>Sanicula europaea</i>
Sickle Medick	<i>Medicago sativa subsp. falcata</i>
Small-flowered Buttercup	<i>Ranunculus parviflorus</i>
Tormentil	<i>Potentilla erecta</i>
Tower Mustard	<i>Arabis glabra</i>
Tubular Water-dropwort	<i>Oenanthe fistulosa</i>
Upright Chickweed	<i>Moenchia erecta</i>
Viola canina subsp. montana	<i>Viola canina subsp. montana</i>
Water Fern	<i>Azolla filiculoides</i>
Wild Strawberry	<i>Fragaria vesca</i>
Wood-sorrel	<i>Oxalis acetosella</i>
Invertebrates	
Common Name	Latin Name
11-spot Ladybird	<i>Coccinella undecimpunctata</i>
Adonis' Ladybird	<i>Hippodamia variegata</i>
Alder Moth	<i>Acronicta alni</i>
Argent & Sable	<i>Rheumaptera hastata</i>
August Thorn	<i>Ennomos quercinaria</i>
Barred Chestnut	<i>Diarsia dahlia</i>
Beaded Chestnut	<i>Agrochola lychnidis</i>
Beautiful Demoiselle	<i>Calopteryx virgo</i>
Berosus luridus	<i>Berosus luridus</i>
Black Piercer	<i>Pammene germmana</i>
Black-headed Cardinal Beetle	<i>Pyrochroa coccinea</i>
Black-spotted Groundling	<i>Pseudotelphusa scalella</i>
Blood-vein	<i>Timandra comae</i>
Bordered Beauty	<i>Epione repandaria</i>
Brindled Beauty	<i>Lycia hirtaria</i>
Broom Moth	<i>Ceramica pisi</i>
Brown-spot Pinion	<i>Agrochola litura</i>
Buff Ermine	<i>Spilosoma lutea</i>
Butterbur	<i>Hydraecia petasitis</i>
Cercyon impressus	<i>Cercyon impressus</i>
Cercyon melanocephalus	<i>Cercyon melanocephalus</i>
Cercyon obsoletus	<i>Cercyon obsoletus</i>
Cercyon tristis	<i>Cercyon tristis</i>
Cercyon ustulatus	<i>Cercyon ustulatus</i>
Cinnabar	<i>Tyria jacobaeae</i>
Cloaked Carpet	<i>Euphyia biangulata</i>
Common Heath	<i>Ematurga atomaria</i>

Cryptopleurum crenatum	<i>Cryptopleurum crenatum</i>
Dark Brocade	<i>Mniotype adusta</i>
Dark Green Fritillary	<i>Speyeria aglaja</i>
Dark Spinach	<i>Pelurga comitata</i>
Dark-barred Twin-spot Carpet	<i>Xanthorhoe ferrugata</i>
Dicranomyia chorea	<i>Dicranomyia chorea</i>
Dot Moth	<i>Melanchra persicariae</i>
Dotted Clay	<i>Xestia baja</i>
Double-line	<i>Mythimna turca</i>
Dusky Brocade	<i>Apamea remissa</i>
Dusky Thorn	<i>Ennomos fuscantaria</i>
Dusky-lemon Sallow	<i>Cirrhia gilvago</i>
Dytiscus semisulcatus	<i>Dytiscus semisulcatus</i>
Ear Moth	<i>Amphipoea oculatea</i>
Enochrus fuscipennis/halophilus/quadrupunctatus	<i>Enochrus fuscipennis/halophilus/quadrupunctatus</i>
Enochrus ochropterus	<i>Enochrus ochropterus</i>
Essex Skipper	<i>Thymelicus lineola</i>
Fen Wainscot	<i>Arenostola phragmitidis</i>
Figure of Eight	<i>Diloba caeruleocephala</i>
Five-spot Burnet	<i>Zygaena trifolii</i>
Flounced Chestnut	<i>Agrochola helvola</i>
Forester	<i>Adscita statice</i>
Four-spotted	<i>Tyta luctuosa</i>
Frosted Yellow	<i>Isturgia limbaria</i>
Garden Dart	<i>Euxoa nigricans</i>
Garden Tiger	<i>Arctia caja</i>
Ghost Moth	<i>Hepialus humuli</i>
Graptodytes granularis	<i>Graptodytes granularis</i>
Grass Emerald	<i>Pseudoterpna pruinata</i>
Green Hairstreak	<i>Callophrys rubi</i>
Green-brindled Crescent	<i>Allophyas oxyacanthae</i>
Grey Dagger	<i>Acronicta psi</i>
Grizzled Skipper	<i>Pyrgus malvae</i>
Heart Moth	<i>Dicycla oo</i>
Hedge Rustic	<i>Tholera cespitis</i>
Helochares punctatus	<i>Helochares punctatus</i>
Helophorus flavipes	<i>Helophorus flavipes</i>
Helophorus granularis	<i>Helophorus granularis</i>
Helophorus nanus	<i>Helophorus nanus</i>
High Brown Fritillary	<i>Fabriciana adippe</i>
Honeysuckle Bell	<i>Eucosmomorpha albersana</i>
Hydroporus striola	<i>Hydroporus striola</i>
Hygrotus confluens	<i>Hygrotus confluens</i>
Indolent Ant	<i>Ponera coarctata</i>

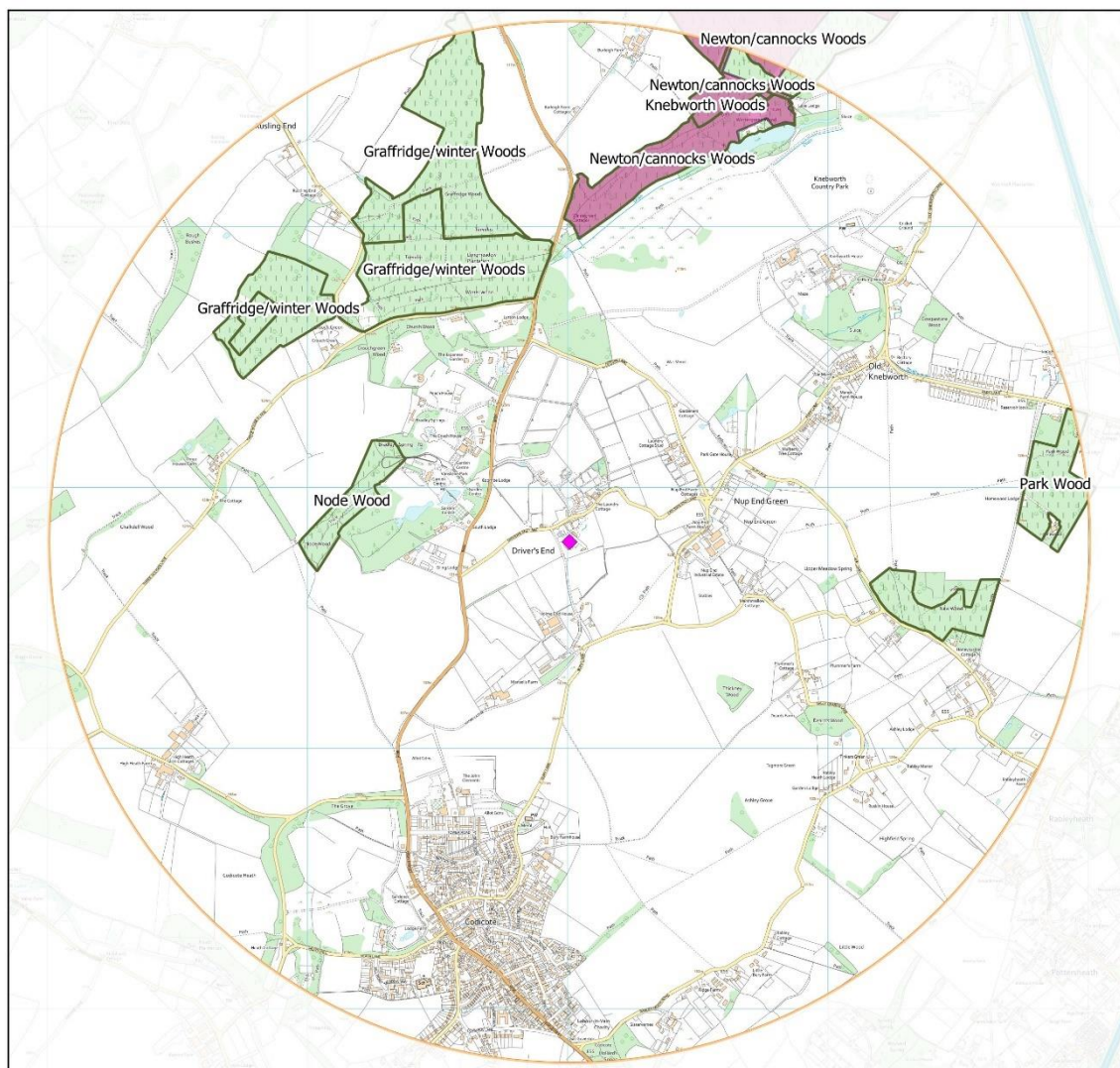
Jersey Tiger	<i>Euplagia quadripunctaria</i>
Knot Grass	<i>Acronicta rumicis</i>
Lackey	<i>Malacosoma neustria</i>
Lappet	<i>Gastropacha quercifolia</i>
Large Nutmeg	<i>Apamea anceps</i>
Large Red-belted Clearwing	<i>Synanthedon culiciformis</i>
Latticed Heath	<i>Chiasmia clathrata</i>
Leptura quadrifasciata	<i>Leptura quadrifasciata</i>
Limnebius papposus	<i>Limnebius papposus</i>
Little Emerald	<i>Jodis lactearia</i>
Lunar Hornet Moth	<i>Sesia bembeciformis</i>
Marsh Fritillary	<i>Euphydryas aurinia</i>
Meroplius minutus	<i>Meroplius minutus</i>
Micronecta (Micronecta) minutissima	<i>Micronecta (Micronecta) minutissima</i>
Mottled Grey	<i>Colostygia multistrigaria</i>
Mottled Rustic	<i>Caradrina morpheus</i>
Mouse Moth	<i>Amphipyra tragopoginis</i>
Neglected Rustic	<i>Xestia castanea</i>
Oak Hook-tip	<i>Watsonalla binaria</i>
Oreodytes sanmarkii	<i>Oreodytes sanmarkii</i>
Pale Shining Brown	<i>Polia bombycina</i>
Pale-lemon Sallow	<i>Cirrhia ocellaris</i>
Pearl-bordered Fritillary	<i>Boloria euphrosyne</i>
Plain Golden Y	<i>Autographa jota</i>
Polycentropus kingi	<i>Polycentropus kingi</i>
Powdered Quaker	<i>Orthosia gracilis</i>
Pretty Chalk Carpet	<i>Melanthia procellata</i>
Purple Emperor	<i>Apatura iris</i>
Red Carpet	<i>Xanthorhoe decoloraria</i>
Roman Snail	<i>Helix (Helix) pomatia</i>
Rosy Minor	<i>Litologia literosa</i>
Rosy Rustic	<i>Hydraecia micacea</i>
Rush Wainscot	<i>Globia algae</i>
Rustic	<i>Hoplodrina blanda</i>
Sallow	<i>Cirrhia icteritia</i>
Scarodytes halensis	<i>Scarodytes halensis</i>
Scymnus auritus	<i>Scymnus auritus</i>
Scymnus femoralis	<i>Scymnus femoralis</i>
September Thorn	<i>Ennomos erosaria</i>
Shaded Broad-bar	<i>Scotopteryx chenopodiata</i>
Sharp-angled Carpet	<i>Euphyia unangulata</i>
Short-barred Yellow Conch	<i>Aethes dilucidana</i>
Shoulder-striped Wainscot	<i>Leucania comma</i>
Small Blue	<i>Cupido minimus</i>
Small Emerald	<i>Hemistola chrysoprasaria</i>

Small Heath	<i>Coenonympha pamphilus pamphilus</i>
Small Pearl-bordered Fritillary	<i>Boloria selene</i>
Small Phoenix	<i>Ecliptopera silaceata</i>
Small Purple-barred	<i>Phytometra viridaria</i>
Small Skipper	<i>Thymelicus sylvestris</i>
Small Square-spot	<i>Diarsia rubi</i>
Spinach	<i>Eulithis mellinata</i>
Stag Beetle	<i>Lucanus cervus</i>
Stictonectes lepidus	<i>Stictonectes lepidus</i>
Streak	<i>Chesias legatella</i>
Stripe-winged Grasshopper	<i>Stenobothrus lineatus</i>
Tanner Beetle	<i>Prionus coriarius</i>
Tipula horticola	<i>Tipula horticola</i>
Tissue	<i>Triphosa dubitata</i>
V-moth	<i>Macaria wauaria</i>
Wall	<i>Lasiommata megera</i>
Wheat Mud Beetle	<i>Helophorus nubilus</i>
White Admiral	<i>Limenitis camilla</i>
White Ermine	<i>Spilosoma lubricipeda</i>
White-legged Damselfly	<i>Platycnemis pennipes</i>
White-letter Hairstreak	<i>Satyrus w-album</i>
White-spot Purple	<i>Eriocrania unimaculella</i>
White-spotted Pinion	<i>Cosmia diffinis</i>
Wood Carpet	<i>Epirrhoe rivata</i>
Wood White	<i>Leptidea sinapis</i>
Yellow-legged Clearwing	<i>Synanthedon vespiformis</i>
Mammals	
Common Name	Latin Name
Brown Hare	<i>Lepus europaeus</i>
Brown Long-eared Bat	<i>Plecotus auritus</i>
Chinese Muntjac	<i>Muntiacus reevesi</i>
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>
Daubenton's Bat	<i>Myotis daubentonii</i>
Eastern Grey Squirrel	<i>Sciurus carolinensis</i>
Eurasian Badger	<i>Meles meles</i>
Eurasian Otter	<i>Lutra lutra</i>
Eurasian Red Squirrel	<i>Sciurus vulgaris</i>
Eurasian Water Shrew	<i>Neomys fodiens</i>
European Water Vole	<i>Arvicola amphibius</i>
Harvest Mouse	<i>Micromys minutus</i>
Lesser Noctule	<i>Nyctalus leisleri</i>
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>

Natterer's Bat	<i>Myotis nattereri</i>
Noctule Bat	<i>Nyctalus noctula</i>
Polecat	<i>Mustela putorius</i>
Serotine	<i>Eptesicus serotinus</i>
Sika Deer	<i>Cervus nippon</i>
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>
Stoat	<i>Mustela erminea</i>
Weasel	<i>Mustela nivalis</i>
West European Hedgehog	<i>Erinaceus europaeus</i>
Western Barbastelle	<i>Barbastella barbastellus</i>
Whiskered Bat	<i>Myotis mystacinus</i>
Molluscs	
Common Name	Latin Name
Roman snail	<i>(Helix pomatia)</i>
Reptiles	
Common Name	Latin Name
Adder	<i>Vipera berus</i>
Common Lizard	<i>Zootoca vivipara</i>
Grass Snake	<i>Natrix helvetica</i>
Slow-worm	<i>Anguis fragilis</i>

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National Sites Map 1

Search Information

- ◆ Search point
- Search area

National Sites

Statutory Sites

- SSSI
- Ancient Woodland Inventory

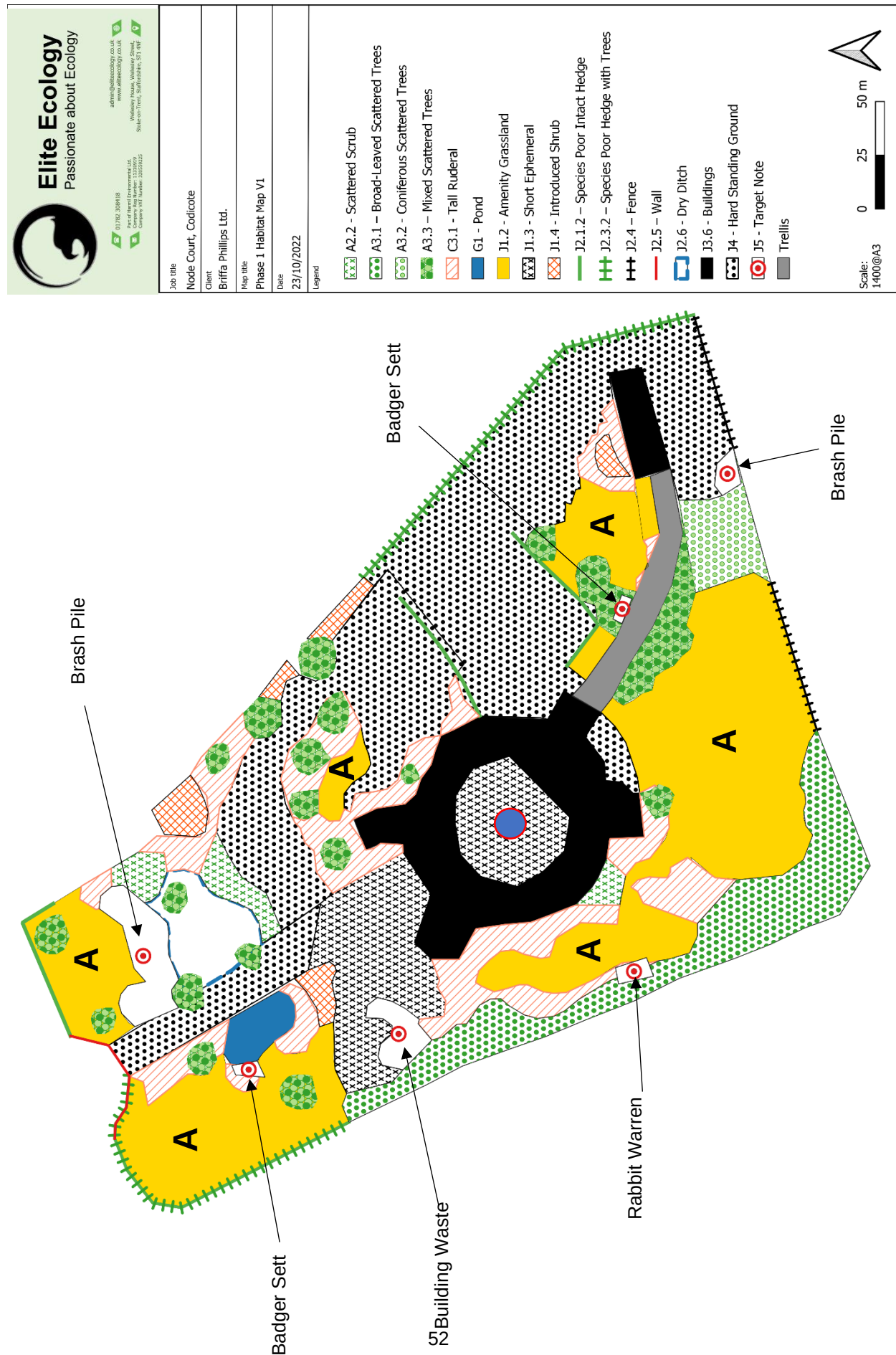
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27/09/2022

Appendix D: Phase 1 Habitat Map



Appendix E: Site Photographs

The site photographs took the report above the 10mb threshold for the site. For a copy of the complete report with photographs, please contact admin@eliteecology.co.uk

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.

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.

Badger

The main legislation protecting badgers in England and Wales is the Protection of Badgers Act 1992 (the 1992 Act). Under the 1992 Act it is an offence to:

- wilfully kill, injure, take or attempt to kill, injure or take a badger;
- possess a dead badger or any part of a badger;
- cruelly ill-treat a badger;
- use badger tongs in the course of killing, taking or attempting to kill a badger;
- dig for a badger;
- sell or offer for sale or control any live badger;
- mark, tag or ring a badger; and
- interfere with a badger sett by:
 - damaging a sett or any part thereof;
 - destroying a sett;
 - obstructing access to a sett;
 - causing a dog to enter a sett; and
 - disturbing a badger while occupying a sett.

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

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.

Licences 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 destruction (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 myotis 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 cat's 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: The Annual Bat Year

A Year in the Life of a Bat			
January		February	
	Hibernating; using up fat reserves.		Still hibernating; few fat reserves left.
March		April	
	Some activity; occasional bat seen feeding.		Awake and feeding at night.
May		June	
	Females looking for nursery sites.		Young born, usually only one.
July		August	
	Young still suckling.		Young start catching insects; females leave nursery to find males.
September		October	
	Mating season begins; start building fat reserves for hibernation.		Search for suitable hibernation site.
November		December	
	Hibernation begins although still some activity in warm weather.		Hibernating.

Appendix I: Bat DNA Results

20 October 22

Re: Genotyping Identification Results for Richard Millington, Elite Ecology

Job number 19066, received 10 October 2022

Sample labelled: Wall in building, Node Court, Hitchin, Hertfordshire, 6/8/2022.

PCR amplification unsuccessful.

Unfortunately, our analysis of this sample failed. We normally re-attempt the analysis up to three times depending on the availability of sample material sent. There are usually three possible reasons for sample failure:

1. DNA degradation has occurred to an extent beyond which we can detect it using PCR technology.
2. The sample might have an unusually high content of inhibiting substances causing enzymatic failure in the analysis.
3. The sample might not have been the target species.

Without further data we are not in a position to judge which of these possibilities is more likely correct. We are sorry to not have been able to identify this sample for you, and we make no charge for the attempt.

Best regards,

Robin Allaby
Associate Professor.

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

School of Life Sciences,
Gibbet Hill Campus,
University of Warwick,
Coventry CV4 7AL
Tel: 02476575059
Fax: 02476574500
Email: r.g.allaby@warwick.ac.uk



18 October 22

Re: Identification Results for Richard Millington, Elite Ecology

Job number 19065, received 10 October 2022

Sample labelled: Feeding roost, Node Court, Hitchin, Hertfordshire, 6/8/2022.

PCR amplification successful. DNA sequence:

ATGACCAACATTTCGAAAGTCCCACCCTCTCATAAAAATTATCAATGACTCATTTCATTG
ACTTACCTGCTCCCTCAAATATTTTCATCATGATGAACTTTGGATCTCTTCTAGGCA

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

School of Life Sciences,
Gibbet Hill Campus,
University of Warwick,
Coventry CV4 7AL
Tel: 02476575059
Fax: 02476574500
Email: r.g.allaby@warwick.ac.uk

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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.

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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.