

Halls Farm, Altar Stones Lane,

Markfield

Ecological Appraisal

2023



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Report Contents

Executive Summary	3
1. Introduction	4
2. Methods	7
3. Results	12
4. Assessment	22
5. Recommendations	27
Appendix 1: Planning Policy & Legislation	29
Appendix 2: Desk Study	32
Appendix 3: Target Notes	33
Appendix 4: Plans	36



Executive Summary

Development Details

The client is proposing commercial development of Halls Farm, Markfield hereafter referred to as the 'site'.

This report describes the ecological features of the site and its surroundings and assesses the potential impacts of the development on the ecological interest. Recommendations are provided so that the development is compliant with biodiversity policy and legislation.

Ecological Interest

The site has a moderate level of ecological interest. Ecological features of interest include habitats such as woodland, grassland, orchard, and ponds. The site has potential to support roosting bats, nesting birds, reptiles, and amphibians.

Outcomes

Phase 1 and 2 surveys have been carried out that are sufficient to fully determine the impact of the proposed development.

A package of measures will be implemented that will include management of retained habitats, reinstatement of aquatic habitat, and habitat creation, provision of roosting opportunities for bats, nesting opportunities for birds and a bug hotel to increase provision on-site for invertebrates.

The measures will be set out in detail in a Construction Environmental Management Plan and a Landscape and Ecology Management Plan.



1. Introduction

1.1 Project Brief

- 1.1.1 Rachel Hacking Ecology Limited was commissioned in 2023 by Hillmoren to carry out an Ecological Appraisal of Hall Farm, Altar Stones Lane, Markfield (O.S. grid reference: SK 4805 1104– see Figure 1).



Figure 1. Site Location (courtesy of Thinking Buildings)

- 1.1.2 The proposed development site is a former farm with outbuildings used as storage, stables, and an apiary. The mature garden contains an orchard, scattered trees and shrubs, blocks of mixed plantation woodland, unmanaged lawns, a pond, flower-beds and hard standing. Beyond the garden there is a

semi-mature mixed plantation woodland, two unmanaged grasslands, a former pond and a near derelict pond. The site is flanked by woodland to the north and west, beyond which is the M1 Motorway and A50 Dual Carriageway. To the east is grasslands and neighbouring properties on Altar Stones Lane.

Description of Development

- 1.1.3 The site will be the subject of a planning application for the construction of Car Showrooms on part of the site. See Figure 2.



Figure 2. Proposed Development Layout (courtesy of Thinking Buildings)

1.2 Scope of Work

- 1.2.1 The Client commissioned Rachel Hacking Ecology to carry out the following works:
- Desk-based study to obtain details of designated sites, protected and notable species within a specified search area.
 - Record the extent, type, and condition of habitats within and next to the site.
 - Calculate the baseline and post-development biodiversity units.
 - Search for signs of protected species and assessment of the potential of habitats and features to support protected and notable species.
 - Carry out targeted surveys to record assemblages of species and/or protected and notable species.

1.3 Surveyor Details

- 1.3.1 Mark Woods *MCIEEM, CEcol* has 35 years of professional experience and has carried out extended Phase 1 habitat, bat emergence and reptile surveys throughout England and Wales.
- 1.3.2 Bat Surveys were carried out by Mark Woods, Zoe Lloyd-Davies (Seasonal Surveyor) and Madeleine Nelson (Seasonal Surveyor).
- 1.3.3 Reptile Surveys were carried out by Zoe Lloyd Davies and Madeleine Nelson.



2. Methods

2.1 Desk Study

- 2.1.1 The Magic Multi-Agency Geographical Information for the Countryside) was interrogated for the presence of Statutory Designated Sites (and European Protected Species licences) within a 2km radius of the site.
- 2.1.2 The Impact Risk Zones for any SSSI within 5km of the site was checked to determine whether the Local Planning Authority will need to consult with Natural England.
- 2.1.3 The Leicestershire Environmental Records Centre was contacted to provide details of non-statutory designated sites and records of protected and notable species within a 1km radius of the site.

2.2 Field Survey

Extended Phase 1 Habitat Survey

- 2.2.1 In accordance with JNCC guidelines¹ the site was walked over by Mark Woods on the 17 July 2023. The habitats and features of ecological interest were mapped and described. Habitats and features of particular interest were target noted.
- 2.2.2 During the walkover habitat and features were assessed for their suitability to support of protected and notable species in accordance with CIEEM guidelines². Field signs of protected, notable, and invasive non-native species, if encountered, were mapped, and described.
- 2.2.3 The weather was sunny with light winds and short-lived, heavy showers.

Bats

- 2.2.4 An initial survey was carried out by Mark Woods on the 17 July 2023. The exterior of the site was surveyed from the ground using binoculars. Features offering potential access to roosting bats were recorded. Such features may include suitable gaps in roof coverings, gaps behind external cladding/facia and gaps in masonry.

¹ JNCC (2010). *Handbook for Phase 1 Habitat Survey: A Technique for Environmental Audit*. Joint Nature Conservation Committee, Peterborough

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

- 2.2.5 Evidence indicating the presence of roosting bats was also searched for. This may include bat droppings on walls, windows or on the ground below roost entrances or staining from fur oil around roost entry points.
- 2.2.6 The interior of the buildings, including the roof voids, were surveyed to identify any evidence indicating use by roosting bats. Such evidence may include bat droppings, feeding remains, urine splashes, live or dead bats and staining from fur oil on timbers.
- 2.2.7 Following the initial inspection emergence surveys were completed on the farmhouse (Building B – two surveys), garage (Building E – one survey) and a stone barn (Building F – one survey). The emergence surveys followed the 2016 guidelines for bat surveys³. The survey effort for the buildings was based on Buildings E and F being of low potential requiring one and three surveyors respectively and Building B being of moderate potential and requiring three surveyors. Metadata for these surveys is given in Table 1 below and the location of the surveyors is provided in Figure 3.

Table 1. Bat Emergence Survey Metadata					
Building	Date	Start - Finish	Sunset	Weather	Surveyors
B	14/08/2023	2020hrs-2200hrs	2033hrs	Overcast, F2-3 wind speed, 16 ⁰ C	MN, MW, ZLD
B	01/09/2023	1938hrs-2123hrs	1953hrs	70% to 20% cloud cover, F1 to F2 wind speed, 17 ⁰ C	MN, MW, ZLD
E	21/08/2023	2004hrs – 2141hrs	2019hrs	Partial cloud, F1-2 wind speed, 19 ⁰ C to 17 ⁰ C	MN, ZLD
F	23/08/2023	2000hrs – 2140hrs	2014hrs	Partial cloud, F0-1 wind speed, 19 ⁰ C to 18 ⁰ C	MN, ZLD

Key: MN – Madeleine Nelson, MW – Mark Woods, ZLD – Zoe Lloyd-Davies

³ Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.



Figure 3. Building Reference and Location of Bat Emergence Surveyors

Reptiles

- 2.2.8 To investigate the use of the site by reptiles a survey using artificial refugia was carried out during September 2023 following the guidance of Froglife⁴. A total of 36 mats were deployed in favourable habitats on the site (see Figure 4). Details of the reptile surveys are provided in Table 2.

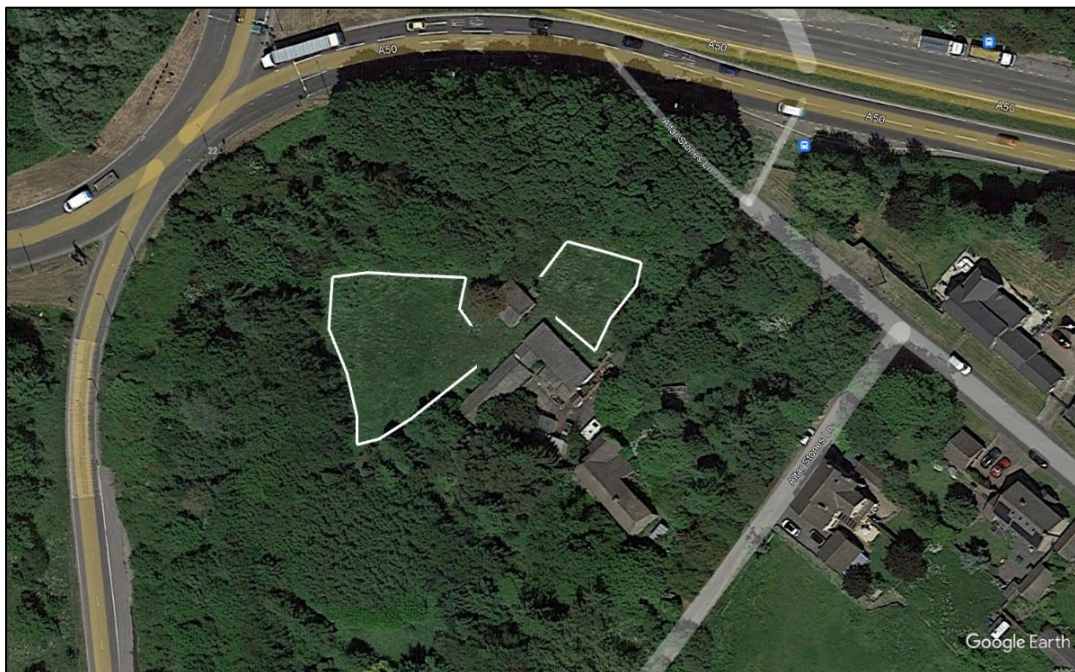


Figure 4. Location of Reptile Mats (White Lines)

⁴ Froglife Advice Sheet 10 REPTILE SURVEY. An introduction to planning, conducting and interpreting surveys for snake and lizard conservation.

Table 2. Reptile Survey Metadata

Date	Weather	Surveyor
04/09/2023	Sunny, F1-2 wind speed, 21-24 ⁰ C	Zoe Lloyd-Davies
05/09/2023	Sunny, F1-2 wind speed, 16-18 ⁰ C	Zoe Lloyd-Davies
07/09/2023	Partial cloud, F1-2 wind speed, 19-20 ⁰ C	Zoe Lloyd-Davies
15/09/2023	Partial cloud, F1 wind speed, 19-20 ⁰ C	Madeleine Nelson
18/09/2023	Cloudy with sunny spells, F2-3 wind speed, 15-16 ⁰ C	Zoe Lloyd-Davies
23/09/2023	Sunny, F2 wind speed, 12-13 ⁰ C	Zoe Lloyd-Davies
28/09/2023	Sunny, F1 wind speed, 14-16 ⁰ C	Zoe Lloyd-Davies

2.3 Biodiversity Net Gain

- 2.3.1 During the site walkover the ecological condition of each habitat was assessed in accordance with the Natural England (2022) guidelines⁵. Habitat types recorded and mapped during the field survey were converted from the JNCC system to the UK Habitat Classification system⁶.
- 2.3.2 Habitat data including type, area, condition, and strategic location were uploaded to the Defra Biodiversity Metric Calculator (version 4.0) spreadsheet to determine the baseline value of the site. The extent of any habitats to be retained or enhanced was also entered into baseline worksheets.
- 2.3.3 The post-development masterplan was interrogated to determine areas of hard standing, buildings, and associated infrastructure. New, retained, and enhanced habitats were classified and allocated a target condition, based on habitat type, location, and management input. This information was uploaded to the metric spreadsheet to obtain a post-development value.
- 2.3.4 The pre- and post-development values were compared to determine whether the yield of biodiversity units achieved a deficit or gain.

2.4 Mitigation Hierarchy

- 2.4.1 Mitigation measures should be embedded within the masterplan design and planning application process. Measures during the construction phases should be included in a Construction Environmental Management Plan: Biodiversity (CEMP). This process from proposal to implementation needs to consider the 'mitigation hierarchy' of avoid, reduce, compensate, and enhance:

⁵ Panks, S. White, N., Newsome, A. et al. (2023). *Biodiversity metric 4: Auditing and accounting for biodiversity – User Guide*. Natural England.

⁶ Butcher, B., Carey, P., et al. (2020). UK Habitat Classification – Habitat Definitions V1.1. at <http://UKhab.org>



- Aim to avoid negative effects through the design process.
- Mitigate if negative effects cannot be avoided.
- Use compensation measures to offset residual impacts.
- Identify and implement opportunities to enhance biodiversity.



3. Results

3.1 Survey Constraints

- 3.1.1 Field survey results are valid for a limited duration and no investigation can provide a complete description and characterisation of a site. The composition of habitats and species can change depending on environmental variables and the mobility of species, so the results of a study become less reliable over time. In some cases, surveys that are 3 years old may be acceptable for a project assuming that habitats have not significantly changed in the intervening period, but for protected species it is likely that survey data will need to be no more than 18 months old.

The survey work was carried out an appropriate time of year and all areas of the site were accessible, so there were no significant constraints.

3.2 Designated Sites

- 3.2.1 The desk study⁷ provided information on the designated sites listed below in Table 3.

Table 3. Designated Sites			
Name	Status	Location/distance	Interest
Cliffe Hill Quarry	SSSI	450m, SW	Geological
Fields south of Ulverscroft Wood	LWS	666, E	Habitats
Ulverscroft Wood	LWS	735, E	Habitats
Hill Hole Meadow	LWS	735, SE	Habitats
Markfield Roadside Verge Nature Reserve 1	LWS	464, E	Habitats
Markfield Roadside Verge Nature Reserve 2	LWS	142, E	Habitats
Markfield Roadside Verge Nature Reserve 3	LWS	251, E	Habitats

⁷ Information regarding historical sites of county interest and geological sites of regional interest that was supplied from LERC are outside of the remit of this study.

Table 3. Designated Sites			
Name	Status	Location/distance	Interest
Raunscliffe	LWS	550, E	Habitats
Hill Hole Quarry	LWS	766, SE	Habitats
Altar Stones	LWS	314, E	Habitats
Markfield, land adj. Cricket Ground	LWS	480, SE	Habitat
Markfield, grassland by Stoney Farm	LWS	713, S	Habitat
Markfield, land adj. to Raunscliffe Farm	LWS	716, SE	Habitat

Key:

SSSI – Site of Special Scientific Interest

LWS – Local Wildlife Site

- 3.2.2 The desk study identified that the site was located within the Impact Risk Zones of ten Sites of Special Scientific Interest. Sites include Cliff Hill Quarry, Sheet Edges Wood, Bardon Hill, Bardon Hill Quarry, Ulverscroft Valley, Benscliffe Wood, Bradgate Park and Cropstone Reservoir, Groby Pool and Woods, and Beaconhill, Hangingstone and Out Woods. For commercial development in rural areas that is larger than 0.2ha the Local Planning Authority will be required to consult with Natural England.

3.3 Habitats

- 3.3.1 Target Notes and photographs are contained in Appendix 3 and the habitats survey plan is contained in Appendix 4.

Woodland and Scrub

- 3.3.2 Most of the site and surrounding area to the west and north was woodland habitat. Adjacent to the site but forming a continuous woodland block with the habitat within the site was a block of semi-mature Plantation Broadleaved Woodland (TN1) with a high forest structure dominated by Sycamore *Acer pseudoplatanus*, with regenerating Sycamore and Hawthorn *Crataegus monogyna* in the shrub layer and a field layer dominated by Bramble *Rubus fruticosus* agg.
- 3.3.3 The perimeter of the site to the north, west and part of the east boundary supported a semi-mature plantation mixed woodland (TN5). The canopy trees included Large-leaved Lime *Tilia platyphyllos*, Swedish Whitebeam *Sorbus intermedia*, Norway Spruce *Picea abies*, Field Maple *Acer campestre*, Red Oak *Quercus rubra*, Ash *Fraxinus excelsior*, Noble Fir *Abies procera*, Western Red Cedar *Tsuga*



heterophylla, Silver Birch *Betula pendula*, and Scots Pine *Pinus sylvestris*. Shrubs are never more than locally frequent and include regenerating trees, Hazel *Corylus avellana*, Hawthorn and Cherry Laurel *Prunus laurocerasus*. The field layer is mostly bare ground with a few woodland herbs such as Wood Avens *Geum urbanum*, Rough Meadow-grass *Poa trivialis*, Foxglove *Digitalis purpurea*, Male Fern *Dryopteris filix-mas*, and Herb Robert *Geranium robertianum*. An L-shaped derelict hedgerow of semi-mature Beech *Fagus sylvatica* is present in the woodland. Standing and fallen deadwood is generally sparse. Within the woodland there are several small sheds of various design, some with brick walls and pitched roofs, and animal enclosures with wooden frames and wire mesh walls and roofs. The woodland scores 23 points and is in 'poor' ecological condition.

- 3.3.4 Parts of the gardens (TN6) contain a range of ornamental trees and shrubs, planted individually into lawns or in groves. The trees and shrubs are, for the most part, semi-mature, but there are some large trees which must have been retained before the latest batch of new planting and garden design. Species include Flowering Cherry *Prunus serrulate*, Norway Maple *Acer platanoides*, Aspen *Populus tremula*, Contorted Willow *Salix 'Tortuosa'*, Sycamore *Acer pseudoplatanus*, Norway Spruce *Picea abies*, Wild Plum *Prunus domestica*, Silverberry *Elaeagnus umbellata*, Dogwoods *Cornus* spp., Chinese Juniper *Juniperus chinensis*, Forsythia *Forsythia x intermedia* and Japanese Wineberry *Rubus phoenicolasius*. This plantation scores 23 points and is in 'poor' ecological condition.
- 3.3.5 A former pond supports a stand of planted Broadleaved Osier *Salix x smithiana* with a few immature Ash (TN8). The mix of canopy species and field layer vegetation of Tufted Hair-grass *Deschampsia cespitosa* and Rough Meadow-grass suggests that soils may be seasonally waterlogged but standing water does not persist for prolonged periods. The woodland scores 21 points and is in 'poor' ecological condition.
- 3.3.6 A small, semi-mature orchard of Apple *Malus domestica* and Plum *Prunus domestica* agg. trees are present within the ornamental gardens (TN6). The field layer vegetation is a neglected lawn of similar composition to other neglected lawns within the site. The ecological condition of the orchard is 'moderate' because there are no ancient trees, limited levels of deadwood, the presence of species-poor grassland and there is colonisation by 'weeds'.

Hedgerow

- 3.3.7 A short section of mature Hawthorn *Crataegus monogyna* hedgerow is located north boundary alongside woodland. It is flanked on its south side by a row of Cherry Laurel *Prunus laurocerasus*, which is shading the Hawthorn. The hedgerow is greater than 1.5 x 1.5m, it is intact vertically but is open at the base and is also flanked by non-native species on one side and a mix of Bramble and Ground Elder *Aegopodium podagraria*. It has no trees and is assessed to be in 'moderate' ecological condition.



Grassland

- 3.3.8 There are two small fields of neglected grassland that is relatively species-poor with an average height of 0.5m, a dense and near continuous thatch and extensive cover of Springy Turf-moss *Rhytidiadelphus squarrosus*. Scrub cover is less than 5%, but the cover of weeds such as Docks *Rumex* spp., Thistles *Cirsium* spp., and Common Nettle *Urtica dioica* exceeds 5%. Species include Yorkshire Fog *Holcus lanatus*, Common Bent-grass *Agrostis capillaris*, Creeping Buttercup *Ranunculus repens*, Hedge Woundwort *Stachys sylvatica*, Lesser Stitchwort *Stellaria graminea*, Black Knapweed *Centaurea nigra*, Tufted Hair-grass, Common Sorrel *Rumex acetosa*, Germander Speedwell *Veronica chamaedrys*, Common Mouse-ear *Cerastium fontanum* and Perennial Rye-grass *Lolium perenne*. The grassland is in 'poor' condition because there are less than eight species per square metre, sward height is uniformly tall, and there are invasive plant species covering more than 5% of the habitat.

Gardens

- 3.3.9 The gardens (TN6) are a mix of habitats including woodland, shrubberies, and individual trees and shrubs, which are described above, and neglected lawns dominated by Red Fescue *Festuca rubra* and Spring Turf-moss. There are also areas of hard standing (patios and paths), pond, stone walls, and neglected flower-beds.

Ponds

- 3.3.10 A rectangular (8m x 4m), stone-lined and heavily shaded pond (TN8) is raised 1.2m above ground and is more than 1.5m deep. It is covered in Duckweed *Lemna minor* and an ornamental form of Yellow Water-lily *Nuphar lutea*. Bittersweet *Solanum dulcamara* is also present in small quantity. The pond is in 'poor' ecological condition because of poor water quality, lack of semi-natural habitat surrounding the pond, and connection to boundary drain,
- 3.3.11 A derelict pond (TN4) is present in woodland TN5. It is heavily shaded and nearly dry despite very wet weather before the site visit. The Willows such as Broadleaved Osier, White Willow *Salix alba* and Alder *Alnus glutinosa* that were present on an island in the centre of the pond have collapsed and overhang the pond in a tangle of part-fallen trunks. There is no aquatic vegetation, and the water quality appears to be poor given the discoloration and turbidity. The pond is in 'poor' ecological condition because of poor water quality, lack of semi-natural habitat surrounding the pond, cover of Common Duckweed and levels of shading.

3.4 Biodiversity Net Gain

- 3.4.1 The baseline habitat type, area, condition, and value are summarised in Table 4. The 23m long Hedgerow TN2 is in moderate ecological condition and has a value of 0.09 units.



Table 4. Baseline Habitats Metric Summary

UK Habitat Classification Type and Target Note (Phase 1 Habitat Type)	Area (Ha)	Condition	Units
Developed land; sealed surface (Buildings, Roads, Pavements, Patios, Yards)	0.098	Not Applicable	0.00
Traditional orchards (TN6) in the woodland garden	0.0105	Moderate	0.13
Other woodland; mixed (TN5)	0.6819	Poor	2.73
Other woodland; mixed (TN6 garden woodland)	0.126	Poor	0.50
Other woodland; broadleaved (TN7 plantation)	0.0382	Poor	0.15
Introduced shrub (TN6 garden shrubbery)	0.0302	Not Applicable	0.06
Other neutral grassland (TN3 and TN6 grasslands)	0.416	Poor	1.66
Ponds (non-priority habitat) – TN4 and TN8 ponds	0.0197	Poor	0.08
Total	1.4205		5.31

3.5 Species

Preliminary Bat Surveys

- 3.5.1 The desk study returned 235 records of at least ten species in the study area including Common Pipistrelle *Pipistrellus pipistrellus*, Nathusius' Pipistrelle *Pipistrellus nathusii*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Brown Long-eared Bat *Plecotus auritus*, Leisler's Bat *Nyctalus leisleri*, Noctule *Nyctalus noctula*, Serotine *Eptesicus serotinus*, Whiskered Bat *Myotis mystacinus*, Daubenton's Bat *Myotis daubentonii* and Natterer's Bat *Myotis nattereri*. The nearest records being less than 200m distance.
- 3.5.2 There were very few trees of sufficient maturity to contain potential roosting features (PRFs) and those that did not contain any obvious features.
- 3.5.3 Building A is a single-storey kennel in woodland TN5 with three walls and a single pitched roof clad in corrugated sheet metal. The wooden door frames and north wall were covered in wire mesh. There were no PRFs, and the building has no potential for roosting bats.
- 3.5.4 Building B is a two-storey farmhouse with a T-shaped pitched roof of concrete tiles and an annex, single-pitch roof also of concrete tiles. The walls are a mix of stone and brick with wooden windows and doors and the southeast facing wall has a cover of Virginia-creeper *Parthenocissus* sp., which

obscures the brick work. On the northwest facing elevation there are raised tiles on the roof, next to chimney stack clad in Climbing Ivy *Hedera helix*. The chimney stack on the opposite southwest corner of the same elevation has missing mortar and cracks where stone meets brick and there is a large hole in the roof next to the chimney stack on the southwest elevation of the roof. Internally there was no evidence of roosting bats found in the three roof spaces that were accessed, but the largest roof space has the hole next to the chimney stack. Potential PRFs are the southeast-facing gable end wall. The chimney stack on the northwest elevation and the raised tiles on the same elevation.

- 3.5.5 Building C is an aviary with associated storerooms. There are several rooms most of which have an external part with a brick base and framework of wood and wire mesh walls and roof. Most of the walls are a mix of breeze-block and brick with a single pitch roof clad in corrugated asbestos(?) sheets. The wooden barge boards are intact. No signs of roosting bats were found and no PRFs.
- 3.5.6 Building D is a single-storey stable block. The walls are a mix of stone and brick, some with a partial cover of pebbledash. The single pitched roof is clad in corrugated asbestos sheets. The stable doors have been left open and the interior is lit by daylight. Pigeon and Hirundine (Swallow *Hirundo rustica*, House Martin *Delichon urbica*) nests are present in the building. No PRFs evidence of bats was found, and the potential is considered to be negligible.
- 3.5.7 Building E is a single storey garage / workshop with walls that are mix of large wooden doors, brick, and to the rear crumbling stones. The internal walls are plastered. The pitched roof is clad in corrugated asbestos sheets with ridge tiles that are externally raised to provide ventilation. Several windows are broken, which could enable access to the interior but there are no obvious PRFs and no roof void. The rear northwest-facing wall has voids within the crumbling stonework, particularly where it joins building D, so the building is considered to have low potential for roosting bats.
- 3.5.8 Building F is a stone-walled, single storey barn with wire mesh covering the larger window. The pitched roof is clad in corrugated asbestos sheets. The northwest and northeast facing walls have lots of holes externally and internally and there is access into the barn through the main doorway and side slits. No signs of roosting bats were found but a search of the floor was not feasible and the voids in the walls are PRFs.
- 3.5.9 The woodlands, ponds, grassland, and gardens are potential foraging habitats, which are connected to the hedgerow network to the east of the M1 Motorway, which provides dispersal routes for bats.

Bat Emergence Surveys

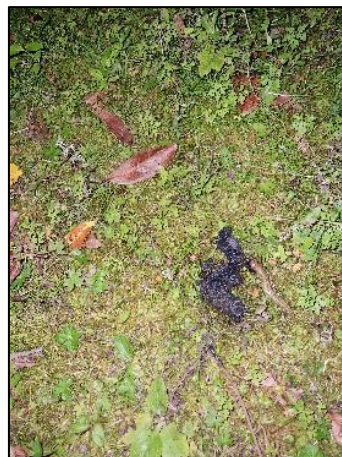
- 3.5.10 Emergence surveys of Building B were completed on 14th August and 1st September 2023. No emergences were recorded, but bat activity in the vicinity of the building included 11 registrations on 14th August 2023 and 21 registrations on the 1 September 2023. The first survey returned six Common Pipistrelle, one Brown Long-eared Bat and four Noctule Bat registrations. The second survey returned

19 Common Pipistrelle and two Noctule registrations. All of these species have been recorded in the local area.

- 3.5.11 An emergence survey of Building E was completed on 21st August 2023. No emergence was recorded from the building, but bat activity in the vicinity of the building included a total of 45 registrations. There were 30 Common Pipistrelle, nine Leisler's Bat and six Noctule registrations. All of these species have been recorded in the local area.
- 3.5.12 An emergence survey of Building F was completed on 23rd August 2023. No emergence was recorded from the building, but bat activity in the vicinity of the building included a total of 23 registrations. There were 19 Common Pipistrelle, one Soprano Pipistrelle, one Whiskered/Brandt's Bat, one Noctule, and one Brown Long-eared bat. All of these species have been recorded in the local area.

Badger

- 3.5.13 The desk study returned seven Badger *Meles meles* records to the east of the M1 motorway, the nearest record being 500m distance from the site.
- 3.5.14 The gardens, grassland and woodland provide suitable habitat to establish a sett and also for foraging and dispersal. No setts were found during any of the site visits (Habitat survey and bat surveys), but badger droppings and snuffle holes were found in the garden TN6 and the east side of woodland TN5 in late August and early September 2023.



Other Mammals

- 3.5.15 The desk study returned records for aquatic mammals, which are not considered any further because the aquatic habitat on site is not suitable and there is no connectivity with suitable habitats.
- 3.5.16 The desk study returned records for Brown Hare *Lepus europaeus* to the west of the M1 Motorway, which are isolated from the study site. Two records of hedgehog *Erinaceus europaeus* were returned from sites to the east of the M1 Motorway. The site contains suitable foraging, resting and dispersal habitat for both species.

Birds

- 3.5.17 The desk study returned 396 records of 40 species within the search area. Suitable habitat is not present for at least nine of the species and at most they would only be observed flying over the site.
- 3.5.18 Goldfinch *Carduelis carduelis*, Great Tit *Parus major*, Robin *Erithacus rubecula*, Blackbird *Turdus merula* and Woodpigeon *Columba palumbus* were observed during the site visit, but the habitat mosaic is suitable to support a wide range of bird species that use woodland, farmland, and urban habitats for nesting, resting, and foraging.

Reptiles

- 3.5.19 The desk study returned three record of Common Lizard *Zootoca vivipara* to the east of the M1 Motorway, the closest being 550m east of the site. The neglected grassland (TN3), woodland edge and sheltered areas of the garden (TN6) provide suitable habitat for reptiles.
- 3.5.20 Targeted surveys (transects and refugia mats) did not detect any reptiles and their presence on the site is not anticipated.

Amphibians

- 3.5.21 The desk study returned 29 records of Common Toad *Bufo bufo*, Common Frog *Rana temporaria*, Smooth Newt *Lissotriton vulgaris* and Great Crested Newt *Triturus cristatus* within the search area. To the east of the M1 Motorway there are six sites that support Common Toad, Common Frog and Smooth Newt the nearest being 550m to the east.
- 3.5.22 The site contains two ponds, which were assessed by use of the Habitat Suitability Index (HSI)⁸. The HSI provided a numerical score to grade the suitability of each pond to support Great Crested Newt, between 0 and 1, with 0 indicating unsuitable habitat and 1 representing optimal habitat. The results of the assessment are summarised in Table 4.

Table 4. Pond Habitat Suitability Index Summary		
Feature	Pond TN4 HSI score	Pond TN8 HSI Score
SI1 - Location	1	1
SI2 - Pond area	0.6	0.05
SI3 - Pond drying	0.1	0.9
SI4 - Water quality	0.33	0.33
SI4 - Shade	0.2	0.2
SI6 - Fowl	1	1

⁸ Oldham R.S., Keeble J., Swan M.J.S. & Jeffcote M. (2000). Evaluating the suitability of habitat for the Great Crested Newt (*Triturus cristatus*). Herpetological Journal 10(4), 143-155.

Table 4. Pond Habitat Suitability Index Summary

Feature	Pond TN4 HSI score	Pond TN8 HSI Score
SI7 - Fish	1	0.01
SI8 - Ponds	0.45	0.45
SI9 - Terrestrial habitat	1	0.01 ⁹
SI10 - Macrophytes	0.3	0.8
Habitat Suitability Index	0.4708 (poor)	0.2009 (poor)

- 3.5.23 Pond TN4 is in a derelict state and its poor HSI score can be attributed to routine drying out, shade, poor water quality, and lack of macrophytes. In addition, discussion with a friend of the former occupants (David Barnes) confirmed that the pond had not held water on a permanent basis for more than a decade.
- 3.5.24 Pond TN8 is 1.2m above ground and is a further 1m deep below ground making the total depth over 2m. The mortared stone walls are fairly smooth and too high for amphibians to negotiate. In addition, discussion with David Barnes confirmed that the pond was stocked with goldfish. Shade, small area, presence of fish, isolation from terrestrial habitat, poor water quality, 100% cover of Common Duckweed contribute to the poor HSI score.
- 3.5.25 David Barnes confirmed that the former pond (TN7) that has been planted with willows used to contain Koi Carp, which would have made it unsuitable for breeding amphibians.

Invertebrates

- 3.5.26 The desk study returned 61 records of 20 species, mostly Lepidoptera. Records of White-clawed Crayfish *Austropotamobius pallipes* and Signal Crayfish *Pacifastacus leniusculus* have been ignored because of a lack of suitable habitat. The site contains suitable habitat for most of the species of Lepidoptera returned by the desk study because of the habitat mosaic.
- 3.5.27 During the site visit no Lepidoptera species were observed but the vegetation was wet so day-flying species may not have been active.

Plants

- 3.5.28 The desk study returned 82 records of 16 notable plant species within the search area. There is suitable habitat on-site for Bluebell *Hyacinthoides non-scripta* and Common Mouse-ear *Cerastium fontanum*. All other species are associated with habitats that are not present on the site.
- 3.5.29 No notable plant species were found during the site survey.

⁹ The raised pond isolates it from the surrounding garden.



3.6 Invasive Species

- 3.6.1 The desk study returned records of five plant species listed on Schedule 9 of the Wildlife & Countryside Act, 1981 including Three-cornered Garlic *Allium triquetrum*, Japanese Knotweed *Reynoutria japonica*, Spotted Archangel *Lamium galeobdolon* subsp. *argentatum*, New Zealand Pygmy-weed *Crassula helmsii*, and Himalayan Balsam *Impatiens balsamifera*. Records of other invasive species not on Schedule 9 include Pampas-grass *Cortaderia selloana*, Hybrid Bluebell *Hyacinthoides x massartiana*, and Cherry Laurel.
- 3.6.2 The desk study also returned records for Chinese Muntjac *Muntiacus reevesi*. No signs of this species were found on the site, but the woodland, grassland and garden provide cover and foraging opportunities, and deer slots of larger deer were present in the boundary wood.
- 3.6.3 No invasive species were found within the site and further consideration in this report is unnecessary.



4. Assessment

4.1 Development Context

- 4.1.1 The following assessment assumes that significant proportion of the site will be developed, and this will result in the loss of garden, woodland, grassland habitats and an ornamental pond. In addition, the existing buildings including the farmhouse, garage, stables, aviary, and storage sheds will be demolished.

4.2 Impacts on Designated Sites

- 4.2.1 This section evaluates and describes potential impacts and assesses ecological effects on designated sites that are within the study area.
- 4.2.2 For several SSSIs within a 5km radius of the site there is a requirement to consult with Natural England because the development is likely to be larger than 0.2hectares and is located in a rural setting. The site is geographically separated from the SSSIs and there is no hydrological connection, so an adverse impact is not anticipated.
- 4.2.3 The nearest LWS is less than 0.2km from the boundary of the site, but all of the LWS within 1km are geographically separated by roads, urban areas or farmland and there does not appear to be any hydrological link so an adverse impact is not anticipated.

4.3 Impacts on Habitats

- 4.3.1 This section evaluates and describes potential impacts and assesses ecological effects on habitats that are within the study area. Hedgerow TN2 on the north boundary is a Habitat of principal Importance.

Woodland and Scrub

- 4.3.2 There will be a loss of woodland habitat from the garden areas (TN6) and the area of woodland (TN5) that is immediately south of the farmhouse. Habitat loss will have an adverse impact at a site level of ecological value. To some extent habitat loss can be offset by targeted management of the retained woodland, shrubberies and individual trees and shrubs, all of which are relatively immature.
- 4.3.3 The traditional orchard in the garden is to be retained along with many of the trees and shrubs and it is anticipated that its moderate condition can be maintained by targeted, long-term management.



- 4.3.4 The Willow plantation (TN7) will be lost because the pond in which it was established is to be reinstated. The short-term impact will be adverse, but the replacement with a pond has the potential to offset the impact if the pond is designed for the benefit of wildlife.

Hedgerows

- 4.3.5 The short section of hedgerow (TN2) on the north boundary will be retained so an adverse impact is not anticipated. The removal of the Cherry Laurel shrubs that are located within the site parallel to the Hawthorn hedgerow will remove shading from the hedgerow and be of benefit to the Hawthorn shrubs.

Grassland

- 4.3.6 Without mitigation the loss of the two small grassland paddocks (TN3) will have an adverse impact but given the low species diversity and poor ecological condition of the habitat the impact will be at a site level of ecological value. Reinstatement of a sympathetic management regime of retained grassland habitat within the garden areas will not fully mitigate the impact, but it will provide long-term opportunities for the retained grassland to become more species-rich and of greater botanical interest.

Garden

- 4.3.7 The layout of the proposed development will enable reinstatement of formally managed flower-beds and shrubberies, which will offset the short-term loss and provide foraging opportunities for a range of common invertebrate species.

Standing Water

- 4.3.8 The loss of pond TN8 will have an adverse but insignificant impact because its design effectively isolates it from its surrounding terrestrial habitat and vertical walls of more than 2m and the presence of fish make it unsuitable for amphibians.
- 4.3.9 The proposed development will include the restoration of ponds TN4 and TN7, which have a positive impact if the designs include native marginal vegetation and a reduction in shade.

4.4 Impacts on Species

Bats

- 4.4.1 Targeted surveys did not detect any bats emerging from Buildings B, E and F. The surveys did, however, confirm the suitability of the site for foraging. The desk study returned records for ten species in the local area and six of those species including Common Pipistrelle, Soprano Pipistrelle, Brown Long-eared Bat, Noctule, Leisler's Bat and Whiskered/Brandt's Bat were recorded on site. Most of the species recorded on site are relatively abundant in Leicestershire but Leisler's Bat is not a common species.



- 4.4.2 Within the perimeter woodland there are a number of small, former animal housing units that are not in use at present. Retention and modification of some of these units has the potential to create roosting opportunities for bats.
- 4.4.3 Without mitigation, habitat loss, particularly woodland, shrubberies and individual trees and shrub could have an adverse impact on bats because of a loss of potential foraging and dispersal habitat. Changes to the layout of the site and the introduction of artificial lighting also has the potential for an adverse effect during and after the construction phase. There is, however, an opportunity through woodland management and the restoration of ponds to have a beneficial impact on bats, which could offset some of the adverse impacts.

Badger

- 4.4.4 Droppings and snuffle holes confirm that Badger is visiting the site to forage, but there are no signs of a sett anywhere on the site. There is, without mitigation, the potential during the construction phase for an adverse impact should a Badger enter the construction zone.
- 4.4.5 In the medium to long-term, targeted management has the potential to create woodland that is more suitable for Badger, particularly if management diversifies the structure and increases the cover of field layer vegetation.

Other Mammals

- 4.4.6 The impacts described for Badger also apply to Hedgehog and Brown Hare, but without mitigation there is a greater risk of harm to Hedgehog during the proposed groundworks. Hedgehog is much more likely to be present in garden areas as well as woodland and grassland. Hedgehog is also attracted to construction sites because of foraging opportunities on features such as spoil heaps.

Birds

- 4.4.7 Habitat loss and disturbance has the potential for an adverse impact, but timing of groundworks outside of the nesting season can reduce the magnitude of short-term impacts and reduce the potential for harm and disturbance management of retained habitats. Creation of aquatic habitats and the provision of nesting facilities for cavity nesting species could offset some of the adverse impacts in the medium to long-term.

Reptiles

- 4.4.8 Given the negative survey results an adverse impact on reptiles is not anticipated.

Amphibians

- 4.4.9 Without mitigation there is potential for an adverse impact if amphibians are present on the site because of the loss of terrestrial habitats during the construction phase including grassland TN3, woodlands TN5 and TN6, parts of the garden TN6 and features such as stone walls, rockeries, and

brush piles. The proposed restoration of ponds TN4 and TN7 provides a significant opportunity to enhance the site for amphibians and if they are not present, to encourage colonisation.

Invertebrates

- 4.4.10 Invertebrates will be subject to the same impacts as other animal groups because of the potential habitat loss and short-term disturbance. Medium to long-term management provides an opportunity to incorporate features that have a particular benefit for invertebrates. Increased volumes of standing and fallen deadwood, aquatic habitat, rock piles, selection of pollen-rich species for flower-beds and specialist nesting habitat such as bug hotels could have a positive impact and offset the impacts of habitat loss.

Plants

- 4.4.11 The loss of protected and notable plant species is not anticipated and targeted mitigation is not necessary.

4.5 Biodiversity Net Gain

- 4.5.1 Table 5 provides a summary of the post-development biodiversity units. The baseline habitat value was 4.17 units and baseline hedgerow value were 0.1 units. The post-development habitat value is 6.26 units, which a gain of 0.95 units (17.79%). The post development hedgerow value is 0.13 units, which is a gain of 0.04 units (46.56%). The biodiversity net gains for habitats and hedgerows are compliant with national biodiversity policy.

Table 5. Site Habitats Post-development				
Habitat	Area (Ha)	Distinctiveness	Target Condition	Units
Hard standing / buildings (Developed land, sealed surface)	0.4898	Not Applicable	Not Applicable	0
Traditional orchard (TN6) retained	0.0105	High	Moderate	0.13
Introduced Shrub (TN6) retained	0.0302	Low	Not Applicable	0.06
Other woodland; mixed (TN5 perimeter woodland) enhanced	0.4327	Medium	Moderate	2.94
Other woodland; mixed (TN6 garden woodland) enhanced	0.126	Medium	Moderate	0.86

Table 5. Site Habitats Post-development

Habitat	Area (Ha)	Distinctiveness	Target Condition	Units
Other neutral grassland (TN3 and TN6) enhanced	0.0764	Medium	Moderate	0.52
Ponds (Non-priority) TN4	0.0182	Medium	Moderate	0.12
Mixed scrub (new)	0.1471	Medium	Moderate	0.98
Ponds (non-priority habitat) – reinstated (TN7)	0.0382	Medium	Moderate	0.27
Other neutral grassland (new)	0.0514	Medium	Moderate	0.38
Total	1.4205			6.26

5. Recommendations

5.1 Further Surveys

- 5.1.1 The extended phase 1 habitats survey, roosting bat and reptile surveys have provided sufficient information to fully determine the ecological impacts of the proposed development.

5.2 Mitigation Measures

- 5.2.1 Protection of ecological features (habitats and species) during the construction phase will be described in a Construction Environmental Management Plan (CEMP). Mitigation measures to protect, maintain and enhance ecological features during the operational phase of development will be described in a Biodiversity Management Plan (BMP). Management Plans will contain Operational Aims and Objectives, Rationale for management, Prescriptions and schedules detailing the timing and responsibility for delivering the prescriptions. It is anticipated that the CEMP and BMP will be provided as a planning condition in advance of the commencement of the proposed development.

Habitats

- 5.2.2 The management plan will set out in detail the implementation of mitigation measures, but outline measures are summarised below.
- 5.2.3 Management of woodland (TN5 and TN6) will include thinning, increased provision of deadwood, and introduction of woodland herbs.
- 5.2.4 Care of individual trees and shrubs, particularly fruit trees, will reduce the risk of disease, improve structure, and increase the harvest of fruit, which will also benefit invertebrates and birds.
- 5.2.5 Relaxed mowing of retained grassland and the introduction of herbs to increase diversity will have a benefit for a wide range of animals, particularly invertebrates and small mammals.
- 5.2.6 Species-poor lawns in the former gardens will be replaced by stands of native shrubs.
- 5.2.7 Native aquatic species will be planted in the restored and reinstated ponds and selective removal of trees and shrubs will reduce bankside shading.
- 5.2.8 Hedgerow TN2 will be enhanced by removal of Cherry Laurel, pruning of overhanging Sycamore trees from adjacent offsite woodland and laying the hedgerow.
- 5.2.9 The condition of retained, enhanced, and created habitats will be monitored on a routine basis by reference to the Biodiversity Metric habitat condition criteria. Management of habitats will be modified when required so that conservation objectives and target conditions are achieved.

Bats

- 5.2.10 Install bat roosting boxes¹⁰ onto trees in the woodland areas in clusters of three, facing southeast, south, and southwest, at least 4m above ground.
- 5.2.11 A detailed lighting plan will be prepared so that levels and type of artificial illumination are controlled and directed away from the woodland edge, shrubberies, ponds, and individual trees.

Badger and Hedgehog

- 5.2.12 To ensure that Badger and any other mammals are not trapped or harmed during the construction work, smaller excavations should be covered if left overnight. Larger excavations, if left overnight or for longer periods, should be ramped to enable animals to escape.

Nesting Birds

- 5.2.13 Impacts on nesting birds should be avoided in particular, by carrying out site clearance and similar operations outside of the bird breeding season (April- August). Construction activities that might directly impact upon breeding birds should hence be limited to the September-February period. If vegetation has to be cleared during the bird breeding season checks immediately before clearance by a suitably qualified ecologist will be required. If nesting activity is detected work in that area will need to stop until the ecologist considers that nesting activity is finished.
- 5.2.14 Attach 20 cavity nest boxes¹¹ to trees within woodland TN5 at least 4m above ground. Nest boxes should have a variety of different sized entrance holes.

Common Amphibians

- 5.2.15 If individual common amphibians are encountered during the clearance of vegetation, work in that area will stop to enable animals to escape to a place of safety. If more than one animal is encountered, the advice of a Suitably Qualified Ecologist will be obtained.

Invertebrates

- 5.2.16 Install a bug hotel¹² in a sunny, sheltered part of the garden.

¹⁰ <https://www.nestbox.co.uk/products/eco-kent-bat-box> (Or an equivalent product)

¹¹ <https://www.nhbs.com/1b-schwegler-nest-box> (or equivalent product)

¹² For example: www.amazon.co.uk/Woodside-Wooden-Insect-Natural-Shelter



Appendix 1: Planning Policy & Legislation

National Policy

The National Planning Policy Framework (NPPF 2021) describes the Government's planning policy for England and how it should be applied. Within this framework, the requirements in relation to biodiversity are included within several policies. The two most relevant to individual planning decisions are Paragraphs 174 and 180, shown below:

- 174. Planning policies and decisions should contribute to and enhance the natural and local environment by:
 - a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);
 - b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;
 - c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;
 - d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures; etc...

- 180. When determining planning applications, local planning authorities should apply the following principles:
 - a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
 - b) development on land within or outside a Site of Special Scientific Interest, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of Sites of Special Scientific Interest;
 - c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons, and a suitable compensation strategy exists; and



- d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

Legislation

The Wildlife and Countryside Act 1981 (as amended by the CRow Act 2000) includes the notification and confirmation of Sites of Special Scientific Interest (SSSIs). SSSIs can be notified for their floral, faunal, geological, or physiographical features. Protection against damaging operations and management of SSSIs is also included within the Act. Impact Risk Zones (IRZs) are zones around an SSSI account for the particular sensitivities of the features for which it is notified and identify development proposal which could have adverse impacts.

The Wildlife and Countryside Act 1981 (as amended by the CRow Act 2000) protects native animals, plants, and habitats. Under the Act it is an offence to intentionally kill, injure or take any wild animal listed on Schedule 5 and it is an offence to interfere with places used for shelter or protection, or intentionally disturb animals occupying such places. The Act prohibits picking, uprooting or destroy any wild plant (or any attached seed or spore) listed in Schedule 8.

European Protected Species (EPS) such as bats, Hazel Dormouse, Otter, Natterjack Toad, Smooth Snake, Sand Lizard and Great Crested Newt are protected by the Wildlife and Countryside Act 1981 (as amended by the CRow Act 2000) and the Conservation of Habitats and Species Regulations 2017. The Acts make it an offence to:

- a) Deliberately capture, injure, or kill an EPS;
- b) Deliberately impair an EPS's ability to survive, breed, reproduce, rear or nurture young; to hibernate or migrate; or significantly affect the local distribution or abundance of the EPS.
- c) Possess or control live or dead EPS or any part of, or anything derived from a EPS;
- d) Damage or destroy a breeding site or resting place of an EPS;
- e) Intentionally or recklessly obstruct access to any place that is used for shelter or protection by an EPS;
- f) Intentionally or recklessly disturb a structure or place that it uses for shelter or protection that is occupied by an EPS.

All common herptiles are protected under the Wildlife and Countryside Act 1981 (as amended by the CRow Act 2000). Grass Snake, Slow Worm, Common Lizard, Adder are protected against intentional killing or injury.



Common Frog, Common Toad, Smooth Newt, and Palmate Newt is protected against sale. In addition, all British reptiles, Common Toad, and Great Crested Newt are listed as Species of Principal Importance.

All nesting birds are protected under the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally kill, injure or take any wild bird or take, damage, or destroy its nest whilst in use or being built, or take or destroy its eggs. It is an offence to intentionally or recklessly disturb a species listed on Schedule 1 of the Act while they are nest building or at or near a nest with eggs or young, or to disturb the dependent young.

The Protection of Badgers Act 1992 makes it an offence to wilfully, or to attempt to kill, injure, take, possess, or cruelly ill-treat a Badger, or intentionally or recklessly interfere with a sett. Interference of a sett includes disturbing badgers during occupation of a sett, or damaging or destroying a sett, or obstructing access to the sett.

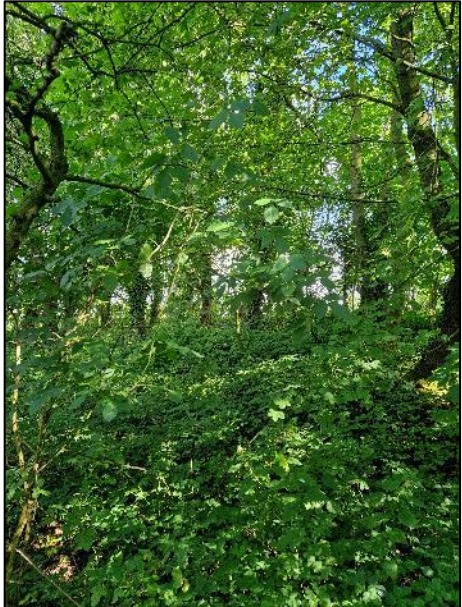
Section 40 of the Natural Environment and Rural Communities (NERC) Act 2006 places a duty on every public authority to have regard to conserving biodiversity. Section 41 of the same Act requires the Secretary of State to publish a list of the living organisms and types of habitats that are of 'Principal Importance' for the purpose of conserving biodiversity. The Secretary of State must take steps, as appear reasonably practicable, to further the conservation of those living organisms and habitats in any list published under this section. The list of species and habitats of principal importance currently includes 943 species and 56 habitats. These are the species and habitats found in England which are regarded as conservation priorities under the UK Post-2010 Biodiversity Framework

The Hedgerows Regulations 1997 protect 'important' hedgerows from destruction or damage. A hedgerow is 'important' if it (a) has existed for 30 years or more; and (b) satisfies at least one of the criteria listed in Part II of Schedule 1 of the Regulations. Under the Regulations, it is against the law to remove or destroy 'important' hedgerows unless permitted by the local planning authority.

Appendix 2: Desk Study

Desk study records are confidential but have been summarised in the text. Detailed records can, however, be provided by Rachel Hacking Ecology upon written request.

Appendix 3: Target Notes

Reference No.	Habitat	Photograph
1	Plantation Broadleaved Woodland	
2	Species-poor Hedgerow	

3	Semi-improved Neutral Grassland	
4	Standing Water	
5	Plantation Mixed Woodland	

6	Habitat Mosaic Semi-improved Grassland / Scattered Broadleaved Woodland / Introduced Shrubs / Orchard	
7	Broadleaved Woodland	
8	Standing Water	

Appendix 4: Plans

