MKA
ECOLOGY

Preliminary Ecological Appraisal and Preliminary Roost Assessment

Arkady, Thicket Road, Houghton

Site	*Arkady, Thicket Road, Houghton*
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Declaration of compliance

This Preliminary Ecological Appraisal and Preliminary Roost Assessment has been undertaken in accordance with British Standard 42020:2013 "Biodiversity, Code of practice for planning and development".

The information which we have provided is true and has been prepared and provided in accordance with the Chartered Institute of Ecology and Environmental Management's (CIEEM) Code of Professional Conduct. We confirm that the opinions expressed are our true and professional bona fide opinions.

MKA Ecology Ltd is a CIEEM Registered Practice. This means that MKA Ecology Ltd are formally recognised for high professional standards, working at the forefront of our profession.

Validity of data

Unless stated otherwise the information provided within this report is valid for a maximum period of 12 months from the date of survey. If works at the site have not progressed by this time an updated site visit may be required in order to determine any changes in site composition and ecological constraints.

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1. EXECUTIVE SUMMARY

In July 2021 MKA Ecology Ltd was commissioned to undertake a Preliminary Ecological Appraisal and Preliminary Roost Assessment of Arkady, Thicket Road, Houghton to assess the potential ecological impacts of a proposed development at the Site.

The appraisal included a habitat survey, protected species scoping survey and desktop study of protected and notable sites and species in the area. The Preliminary Roost Assessment involved a detailed inspection of the buildings and trees set to be impacted by the development. The aim of the Preliminary Roost Assessment was to identify any potential bat roost constraints that may be associated with the proposed conversion of the buildings at the Site. A site visit undertaken on 20 July 2021.

The site comprises a single-storey residential dwelling and wooden-cladded barn surrounded by garden habitat, with modified grassland, introduced shrubs, native hedgerow, hardstanding, scattered trees and two small outbuildings. The proposed development involves an extension and renovation of existing residential dwelling and conversion of the barn. There is no anticipated loss of garden habitat and pruning/felling of trees is likely to be minimal.

The following ecological constraints were identified at the Site with recommendations made as follows;

- **Habitat:** A native hedgerow, a Habitat of Principal Importance, was present along the northern and north-eastern boundary of the Site and the garden contained multiple mature and semi-mature trees: both of which can act as important features for local wildlife. The hedgerow should be retained, protected and enhanced. All trees should be retained and protected from accidental damage during works.
- **Birds:** The hedgerows, scattered trees and wooden barn provide suitable habitat for breeding birds. It is recommended that any clearance works affecting these features should take place outside of the breeding season, which runs from March to August (inclusive). Vegetation clearance works and building demolition between the months of March and August will require a pre-commencement nesting bird check, carried out by an experienced ornithologist.
- **Bats:** The single storey residential dwelling was deemed to be of high roosting potential for bats with confirmed evidence of roosting bats in the loft space and numerous potential access points and roosting features. It is recommended that three nocturnal surveys are undertaken to ascertain the presence or absence of roosting bats.
- **Hedgehogs:** Suitable hedgehog habitat present on site within the garden and dead hedgehog found within Site boundary. It is recommended that provisions for this species are made post-development, including hedgehog highways.

Opportunities exist to enhance the biodiversity on the Site post-development. These include the enhancement of existing hedgerow habitat or the creation of new hedgerows along the boundaries. Provision of bird and bat boxes is also recommended. These enhancements National Planning Policy framework, which aims for “no net loss” of biodiversity in the development process.

2. INTRODUCTION

2.1. Aims and scope of Preliminary Ecological Appraisal and Preliminary Roost Assessment

In July 2021 MKA Ecology Limited was commissioned to undertake a Preliminary Ecological Appraisal and Preliminary Roost Assessment of Arkady, Thicket Road, Houghton by Devlin Architects Ltd in order to support a planning application for renovation of the existing residential dwelling and conversion of the barn.

The aims of the Preliminary Ecological Appraisal and Preliminary Roost Assessment were to:

- Undertake a desktop study to identify the extent of protected and notable species and habitats within close proximity of the Site;
- Prepare a habitat map for the Site;
- Identify evidence of protected species/species of conservation concern at the Site;
- Assess the potential impacts of the proposed development, using existing plans;
- Detail recommendations for further survey effort where required;
- Detail recommendations for biodiversity enhancements;
- Undertake a daytime inspection survey to establish the suitability of the buildings and trees at the site for roosting bats, and record any evidence of bat presence; and
- Assess the need for further survey effort, a European Protected Species Licence or mitigation for bats, if required.

2.2. Site description and context

The survey area is shown on the map in Figure 1. Within this report this area is referred to as the Site or Arkady, Thicket Road, Houghton (Central grid reference: TL 28431 72224). It is located within the village of Houghton and falls under the authority of Huntingdonshire District Council. The Site comprises a single-storey residential dwelling and a wooden cladded barn surrounded by garden habitat, with modified grassland, introduced shrubs, native hedgerow, hardstanding, scattered trees and two smaller out-buildings that will not be impacted by the development.

The Site is surrounded residential housing and gardens on all sides. The wider landscape beyond the village comprises a mix of grazing pasture, with arable to the north of the village. The river Great Ouse runs to the south of the village and the surrounding habitat contains a mix of hay meadows with hedgerows, riparian woodland and grasslands.

2.3. Proposed development

Plans for the development the Site include an extension and renovation of the existing residential dwelling and conversion of the barn.

2.4. Legislation and planning policy

This Preliminary Ecological Appraisal and Preliminary Roost Assessment has been undertaken with reference to relevant wildlife legislation and planning policy.

Relevant legislation considered within the scope of this document includes the following:

- The Wildlife and Countryside Act 1981 (as amended);
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- Natural Environment and Rural Communities (NERC) Act 2006;
- The Countryside and Rights of Way (CRoW) Act 2000;
- Protection of Badgers Act 1992; and
- Wild Mammals (Protection) Act 1996.

Further information is provided in Appendix 1, including levels of protection granted to the species considered in Section 3.3.

In addition to obligations under wildlife legislation, the revised National Planning Policy Framework (NPPF) updated on 20 July 2021 requires planning decisions to contribute to conserving and enhancing the local environment. Further details are provided in Appendix 1.

Huntingdonshire District Council has produced an adopted local plan (2019) which covers a number of policies relating to biodiversity and habitat conservation, including:

- *LP 30 Biodiversity and Geodiversity:* A proposal will be required to demonstrate that all potential adverse impacts on biodiversity and geodiversity have been investigated. All possible efforts must be taken to avoid adverse impacts. If it is demonstrated that adverse impacts are unavoidable they must be minimised as far as possible and then mitigated.
- *LP31 Trees, Woodland, Hedges and Hedgerows:* A proposal will be required to demonstrate that the potential for adverse impacts on trees, woodland, hedges and hedgerows has been investigated. Where investigations show that such adverse impacts are possible a statement will be required that: a. assesses all trees, woodland, hedges and hedgerows that would be affected by the proposal, describing and assessing their value; b. sets out how the details of the proposal have been decided upon in terms of their impact on the value of trees, woodland, hedges and

hedgerows and how adverse impacts will be avoided as far as possible, or if unavoidable how they will be minimised as far as possible.

Where relevant these are discussed in further detail in Section 5.

3. METHODOLOGIES

This Preliminary Ecological Appraisal and Preliminary Roost Assessment has been undertaken in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Preliminary Ecological Appraisal, 2nd edition (CIEEM, 2017), and *Bat Surveys for Professional Ecologists – Good Practice Guidelines (3rd edition)* (Collins, 2016).

3.1. Desktop study

A data search was conducted for the Site and the surrounding area within 2km. Data was retrieved from the sources listed in Table 1.

Table 1: Sources of data for desktop study

Organisation	Data collected	Date collected
Multi-agency Geographic Information for the Countryside (MAGIC) www.magic.gov.uk	Information on local, national and international statutory protected areas.	05/08/2021
Cambridgeshire and Peterborough Environmental Records Centre (CPERC)	Information on protected and notable sites and species within 2km of the Site (TL 28431 72224).	09/07/2021
Ordnance Survey maps and aerial photography	Information on habitats and connectivity between the Site and the surrounding landscape	05/08/2021
Plantlife Important Plant Areas	Information on important plant areas within 2km of the Site (TL 28431 72224).	05/08/2021
Buglife Important Invertebrate Areas	Information on important invertebrate areas within 2km of the Site (TL 28431 72224).	05/08/2021

3.2. Habitat survey

Habitats were surveyed using the standardised UK Habitat classification and mapping methodology (UK Habs) (Butcher et al, 2020). Data were recorded onto field maps and then transferred onto a Geographic Information System (GIS) following the UK Habs Colour Mapping Pallet for QGIS. Dominant plant species were observed and recorded within each habitat type. The plant species nomenclature follows that of Stace (2019).

The DAFOR scale is used to describe the relative abundance of species. The scale is shown in Table 2. It is important to note that where a species is described as rare this description refers to its relative

abundance within the Site and is not a description of its abundance within the wider landscape. Therefore, a species with a rare relative abundance within the Site may be common within the wider landscape.

Table 2: DAFOR scale

DAFOR code	Relative abundance
D	Dominant
A	Abundant
F	Frequent
O	Occasional
R	Rare

3.3. Protected and notable species scoping survey

As part of the Preliminary Ecological Appraisal, an assessment of the potential for the habitats on site to support protected or notable species was made. This assessment was based on the quality, extent and interconnectivity of suitable habitats, along with the results of the desktop study detailed in Section 3.1. The potential to support rare or notable species is also considered. This includes Species of Principal Importance as listed on Section 41 of the Natural Environment and Rural Communities (NERC) Act (2006), and Red and Amber listed Birds of Conservation Concern (BoCC) as per Eaton *et al*., 2015 (see Appendix 1).

Protected and notable species considered within the protected species scoping survey for Arkady, Thicket Road, Houghton include the following:

- Plants and fungi: Annual knawel *Scleranthus annuus*, chicory *Cichorium intybus*, cornflower *Centaurea cyanus*, crosswort *Cruciata laevipes,* green-winged orchid *Anacamptis morio*.
- Invertebrates: Grizzled skipper *Pyrgus malvae*, small heath Coenonympha pamphilus, large garden (ruderal) bumblebee *Bombus ruderatus*, beaded chestnut *Agrochola lychnidis*, oak hook-tip *Watsonalla binaria*.
- Fish: European eel *Anguilla anguilla*, river lamprey *Lampetra fluviatilis*, brown trout *Salmo trutta subsp. fario*.
- Amphibians: great crested newt *Triturus cristatus* and common toad *Bufo bufo*.
- Reptiles: Adder *Vipera berus*, common lizard *Zootoca vivipara*, slow-worm *Anguis fragilis*, grass snake *Natrix natrix helvetica*.
- Birds: Species amber or red-listed as birds of conservation concern or listed under Schedule 1 of The Wildlife and Countryside Act 1981 (as amended).

- Mammals: Badger *Meles meles*, bats (all species), water vole *Arvicola amphibius*, otter *Lutra lutra*, hazel dormouse *Muscardinus avellanarius*, hedgehog *Erinaceus europaeus*, brown hare *Lepus europaeus*, harvest mouse *Micromys minutus* and polecat *Mustela putorius*.

In each case the likelihood of presence of these protected species at the Site was classified as being either confirmed, high, moderate, low or negligible.

Confirmed: The species is confirmed on the site during the Preliminary Ecological Appraisal, previous survey effort or recent records.

High: Habitats are available onsite which are highly suitable for this species and there are records within the desktop study. The surrounding areas also provide widespread opportunities for the species which are well connected to the Site.

Moderate: Some suitable habitat available on site for the species although not of optimum quality. Species is present with the desktop study.

Low: Some suitable habitat available on site for the species but this is low value and possibly of small scale or with poor connectivity. No, or very few, records returned in the desktop study.

Negligible: No suitable habitat available for the species, or very little poor-quality habitat.

This protected species scoping survey is designed to assess the *potential* for presence or absence of a particular species or species group, and does not constitute a full survey for these species.

3.4. Preliminary Roost Assessment

The Site contained two buildings and a number of trees in the garden area. The buildings and trees in close proximity to the buildings were inspected; the locations of these are shown in Figure 1. An internal and external inspection of the building and trees at the site was undertaken following guidance set out in *Bat Surveys for Professional Ecologists – Good Practice Guidelines (3rd edition)* (Collins, 2016).

The following features were recorded for buildings:

- Location;
- Type;
- Dimensions;
- Age;
- Construction materials; and
- Current use.

Descriptions of potential and actual access points and roosting places were recorded (including height above ground level and aspect), as well as descriptions of evidence of bats found. The following types of evidence of use by bats were recorded:

- Location and number of any live bats;
- Location and number of any bat corpses or skeletons;
- Locations and number of bat droppings;
- Notes on relative freshness, shape and size of bat droppings;
- Location and quantity of any bat feeding remains;
- Location of clean, cobweb-free timbers, crevices and holes;
- Location of characteristic staining from urine and/or grease marks;
- Location and quantity of bat-fly (Nycteribiidae) pupal cases;
- Location of known and potential access points to the roost; and
- Location of the characteristic smell of bats.

The following features were recorded for trees:

- Species.

Descriptions of suitable and actual roost features were recorded (including height above ground level and aspect), as well as descriptions of evidence of bats found. Potential roost features recorded were:

- Woodpecker holes;
- Rot holes;
- Hazard beams;
- Other vertical or horizontal cracks and splits (such as frost-cracks) in stems or branches;
- Partially detached plately bark;
- Knot holes arising from naturally shed branches, or branches previously pruned back to the branch collar;
- Man-made holes (e.g. cavities that have development from flush cuts) or cavities created by branches tearing out from parent stems;
- Cankers (caused by localised bark death) in which cavities have developed;
- Other hollows or cavities, including butt-rots;
- Double-leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stem diameters in excess of 50mm; and
- Bat, bird or dormouse boxes.

The following types of evidence of use by bats were recorded for trees:

- Presence of bats;
- Bat droppings in, around or below a potential roost feature;
- Odour emanating from a potential roost feature;
- Audible squeaking at dusk or in warm weather; and
- Staining below the potential roost feature.

The building and trees were assessed for their bat roost suitability according to the scheme presented in Collins (2016). These categories are shown in Table 3.

Table 3: Categories to assess roost suitability in buildings and trees (adapted from Collins, 2016)

Roost suitability	Description
Negligible	Negligible habitat features on site likely to be used by roosting bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions* and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain potential roost features but with none seen from the ground or features seen with only very limited roosting potential.
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potential for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

*For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

The guidelines for categorisation of bats in England by distribution and rarity (adapted from Wray *et al*., 2010) are shown in the tables below.

Table 4: Rarity of bat species within England

Rarity within range (England)	Species
Rarest (population under 10,000)	Greater horseshoe bat *Rhinolophus ferrumequinum* Bechstein's bat *Myotis bechsteinii* Alcathoe's bat *Myotis alcathoe* Greater mouse-eared bat *Myotis myotis* Barbastelle *Barbastella barbastellus* Grey long-eared bat *Plecotus austriacus*
Rarer (population 10,000 to 100,000)	Lesser horseshoe bat *Rhinolophus hipposideros* Whiskered bat *Myotis mystacinus* Brandt's bat *Myotis brandtii* Daubenton's bat *Myotis daubentonii* Natterer's bat *Myotis nattereri* Leisler's bat *Nyctalus leisleri* Noctule *Nyctalus noctula* Serotine *Eptesicus serotinus*
Common (population over 100,000)	Common pipistrelle *Pipistrellus pipistrellus* Soprano pipistrelle *Pipistrellus pygmaeus* Brown long-eared bat *Plecotus auritus*

Table 5: Level of importance of roost type

Geographic frame of reference	Roost type
District, Local or Parish	Feeding perches (common species) Individual bats (common species) Small numbers of non-breeding bats (common species) Mating sites (common species)
County	Maternity sites (common species) Small numbers of hibernating bats (common and rarer species) Feeding perches (rarer/rarest species) Individual bats (rarer/rarest species) Small numbers of non-breeding bats (rarer/rarest species)
Regional	Mating sites (rarer/rarest species) including well-used swarming sites Maternity sites (rarer species) Hibernation sites (rarest species) Significant hibernation sites for rarer/rarest species or all species assemblages

Geographic frame of reference	Roost type
National/UK	Maternity sites (rarest species) Sites meeting SSSI guidelines*
International	SAC sites

*Sites meeting SSSI (Sites of Special Scientific Interest) selection guidelines include Barbastelle maternity roosts and mixed species hibernacula assemblages

3.5. Equipment

The Preliminary Roost Assessment was conducted using a variety of equipment including ladders, digital video endoscope, inspection mirrors, binoculars, high-powered torch and a digital camera.

3.6. Surveyor, author and reviewer

The surveys were undertaken by Robert Bishop GradCIEEM, Consultant Ecologist and Evan Burdett Graduate Ecologist, both of MKA Ecology Ltd. Robert has three years' experience conducting professional ecology surveys and holds a Level 2 bat licence and a Level 1 Great crested newt licence. Evan has one years' experience as an ecological consultant. The report has been written by Evan and reviewed by Will O'Connor CEcol MCIEEM, Director and Principal Ecologist at MKA Ecology Ltd. Will has over ten years' experience as a consultant ecologist and holds a Level 2 bat licence and a Level 1 great crested newt licence.

3.7. Date, time and weather conditions

See Table 6 below for details of the date, time and prevailing weather conditions recorded during the site visit for the Preliminary Ecological Appraisal and Preliminary Roost Assessment.

Table 6: Date, time and weather conditions of survey visit

Date	Time of survey	Weather conditions*
20/07/2021	14:00	Wind: S Cloud: 2/8 Temp: 27°C Rain: None

*Wind as per Beaufort Scale / Cloud cover given in Oktas.

3.8. Constraints

A single visit cannot always ascertain the presence or absence of a protected species. However, an assessment is made of the likelihood for protected species to occur based on habitat characteristics

and the ecology of each species. Where there is potential for protected species, additional survey work may be required to ascertain their presence or absence.

Data on species records obtained from local biological records centres are sometimes only available at low spatial resolutions and are constrained by the voluntary nature of the contributions and what has been chosen to be submitted as records. While these records provide a useful indication of species recorded in the local area, in particular protected or notable species, the data is not necessarily an accurate reflection of species assemblages or abundance in the vicinity.

4. RESULTS

4.1. Desktop study

An ecological desktop study was completed for the Site and the surrounding 2km. Data provided by Cambridgeshire and Peterborough Environmental Records Centre (CPERC) identified a number of UK and European protected species, Species and Habitats of Principal Importance (as listed under Section 41 of the NERC Act 2006), and species of conservation concern within 2km of the Site. It should be noted that this is not a comprehensive list of the distribution or extent of the local flora and fauna of conservation importance. These species records are discussed in greater detail in the protected species scoping survey section (Section 4.3 below).

Two statutorily designated sites were identified as part of the desktop study. These were both Sites of Special Scientific Interest (SSSI) designated for their biological interest. As such they are not considered further in this ecological report.

Table 7: Statutorily designated sites within 2km of Arkady, Thicket Road, Houghton

Site name*	Area (ha)	Distance and direction	Reasons for selection
Houghton Meadows SSSI	4.65	0.8 km SE	These ridge-and-furrow meadows hold neutral grassland communities of a type now rare in Cambridgeshire and declining nationally. A rich variety of broadleaved herbs is present.
Godmanchester Eastside Common SSSI	29.71	1.3 km SW	The site consists of two areas of neutral grassland separated by a dismantled railway line. The main grassland types which are represented are known as calcareous loam and calcareous clay pasture types and both are of restricted extent and distribution.

*SSSI: Site of Special Scientific Interest

Details of non-statutorily designated sites identified as part of the desktop study are displayed in Table 8 below. These consist of nine County Wildlife Sites (CWS).

Table 8: Non-statutorily designated sites within 2km of Arkady, Thicket road, Houghton

Site name	Area (ha)	Distance and direction	Reasons for selection
Anglian Meadows (CWS)	7.88	0.5 km SE	The site qualifies as CWS because it supports at least 0.05ha of NVC community MG5 Crested Dog's-tail - Black Knapweed grassland. Additionally it supports frequent numbers of at least 8 neutral grassland indicator species.
Cow Lane Gravel Pits (CWS)	79.64	1.6 km W	Supports a population of a Nationally Rare dragonfly; at least 0.5ha of NVC S4; regularly contains 0.5% or more of the total British non-breeding population of Gadwall; contains a large breeding colony of Lesser Black-Backed Gull.
Hemingford Abbots Meadow (CWS)	43.74	0.5 km SW	The site qualifies as CWS because it supports at least 0.05ha of MG5 Crested Dog's-tail - Black Knapweed grassland. Additionally it supports populations of Nationally Scarce vascular plant species.
Hemingford Grey Gravel Pits (CWS)	10.64	1.6km	The site qualifies because it regularly contains 0.5% or more of the total British non-breeding population of Gadwall.
Hemingford Grey Meadow (CWS)	43.86	1.7 km	Supports at least 0.05ha of NVC MG4 (meadow foxtail - greater burnet flood meadow) and supports a population of a Nationally Scarce vascular plant species (*Oenanthe silaifolia*).
Houghton Grange Grassland (CWS)	4.31	1.6 km SW	The site qualifies as CWS because it supports at least 0.05ha of NVC community MG5 Crested Dog's-tail -Black Knapweed grassland.
Houghton Meadow Pollard Willows	5.93	0.6 km S	The site qualifies as CWS because it supports at least 5 mature pollard willows in association with other semi-natural habitat.
River Great Ouse (CWS)	N/A	1 km S	A major river not grossly modified by canalisation or poor water quality; supports >0.5ha NVC S6 swamp; >0.5ha S4 swamp; >0.05ha MG13 grassland; a NS vascular plant (*Nymphoides peltata*); breeding populations of a NR dragonfly (*Libellula fulva*)
Willow Pollards North of Wyton Pit (CWS)	10.54	1.9 km NW	The site qualifies as CWS because it supports at least five mature pollard willows in association with other semi-natural habitat.

The Site is located within the village Houghton, which comprises mostly residential buildings and garden habitat. The wider landscape comprises a mix of grazing pasture and arable to the north of the village. The river Great Ouse runs to the south of the village and the surrounding habitat contains a mix of hay meadows with hedgerows, riparian woodland and grasslands, many of which are designated as County Wildlife Sites for their value to wildlife and people.

4.2. Habitat survey

The Site was found to comprise a residential dwelling and barn with associated garden habitat, comprising modified grassland, introduced shrubs, native hedgerow, hardstanding and scattered trees. More detailed species lists, along with their relative abundance, can be found in Appendix 2. The habitat survey map is provided in Figure 1, at the end of this section. Descriptions of the habitat types present along with dominant species compositions are provided below.

Built up areas and gardens, scattered trees – u1, 11
The garden comprised a mix modified grassland interspersed with scattered trees and shrubs, gravel and hardstanding. The vegetation was under a garden management regime (Appendix 3, Photograph 1). The garden lawn was dominated by perennial rye grass *Lolium perenne*, and a number of occasionally occurring herb species, including germander speedwell *Veronica chamaedrys*, selfheal *Prunella vulgaris*, and ground ivy *Glechoma hederacea* in the shady parts of the lawn.

There were a number of scattered trees throughout the garden, comprising a mix of native and non-native ornamental species, including: walnut *Juglans regia*, silver birch *Betula pendula*, rowan *Sorbus aucuparia*, apple *Malus domestica*, Leyland cypress *Cupressus leylandii* and whitebeam *Sorbus aria*. A list of tree species recorded during the visit can be found in Appendix 2.

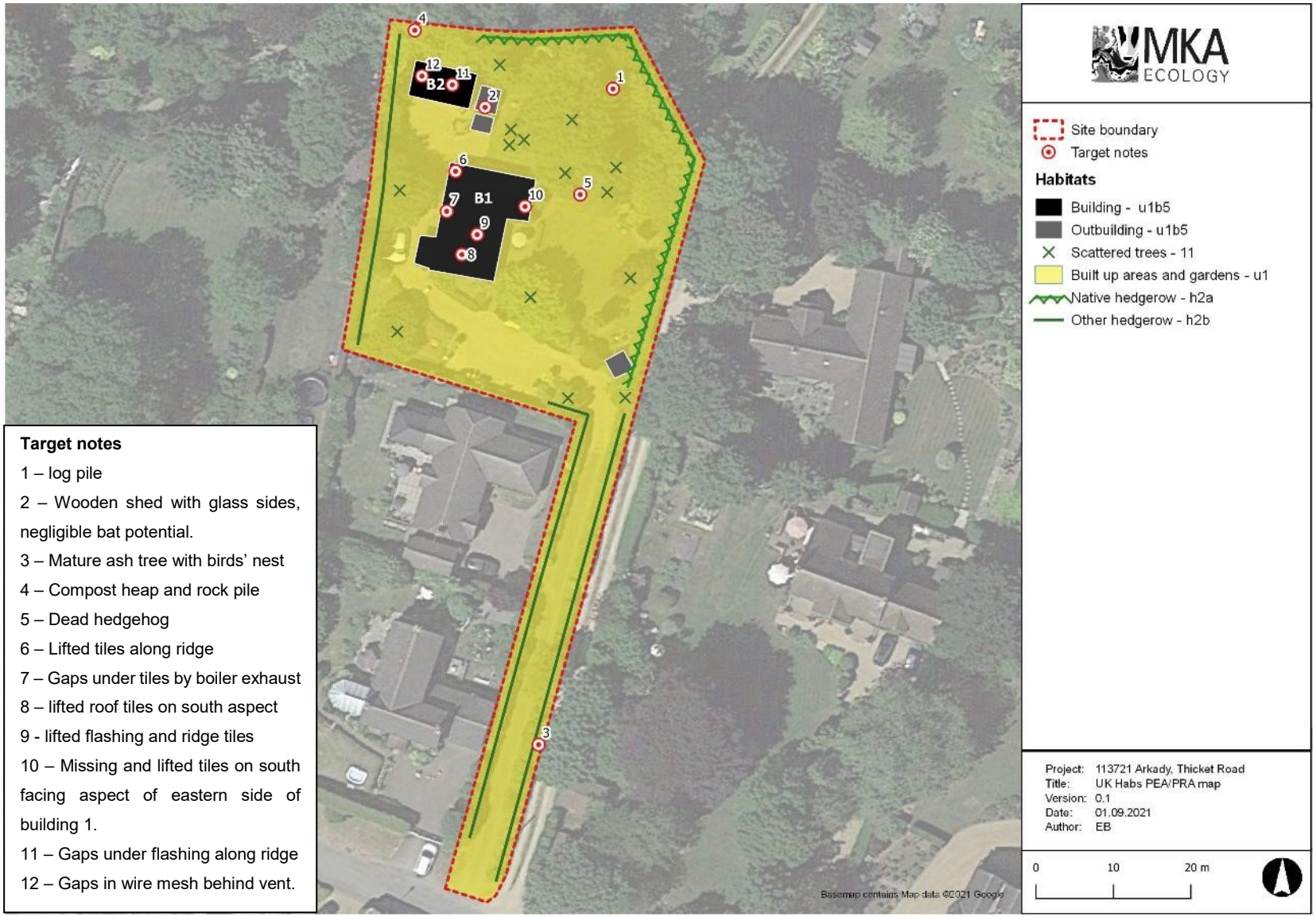
Native hedgerow (priority habitat) – h2a
A native hedgerow was present along the northern and eastern boundary of the site. The northern boundary section contained a mix of native species, including hawthorn *Crataegus monogyna*, holly *Ilex aquifolium*, Yew *Taxus baccata*, hazel *Corylus avellana* and elder *Sambucus nigra*, with planted ground flora, including sweet woodruff *Galium odoratum*, yellow archangel *Lamium galeobdolon* and red campion *Silene dioica*. The eastern section was a single species native hedgerow, consisting entirely of beech *Fagus sylvatica*.

Other hedgerow – h2b
The majority western and southern boundary hedgerow and the hedgerow along the gravel driveway comprised a mix of introduced garden trees and shrubs, with a small number of native trees and shrubs. There was frequently occurring box honeysuckle *Lonicera nitida*, Leyland cypress *x Cupressocyparis leylandii*, Ivy *Hedera helix,* Cherry laurel *Prunus laurocerasus* and small field elm *Ulmus minor.*

Building – u1b5

There was a single residential dwelling and barn, both buildings are described in the results of the Preliminary Roost Assessment (Photograph 3). There were two smaller outbuildings at the property, however these are not affected by the proposed development and did not have feautures suitbale for roosting bats, they are not considered further in this report.

Figure 1: Habitat map of Arkady, Thicket Road, Houghton



Target notes

1 – log pile

2 – Wooden shed with glass sides, negligible bat potential.

3 – Mature ash tree with birds' nest

4 – Compost heap and rock pile

5 – Dead hedgehog

6 – Lifted tiles along ridge

7 – Gaps under tiles by boiler exhaust

8 – lifted roof tiles on south aspect

9 - lifted flashing and ridge tiles

10 – Missing and lifted tiles on south facing aspect of eastern side of building 1.

11 – Gaps under flashing along ridge

12 – Gaps in wire mesh behind vent.

4.3. Protected and notable species scoping survey

Plants and fungi

The data search returned a number of protected or notable plant species within the search area. These included species listed under Section 41 of the NERC Act (2006), Cambridgeshire and Peterborough Additional Species of Interest, and those red-listed as vulnerable for Great Britain or nationally scarce. Some of the protected and notable species returned in the data search included: annual knawel, chicory, cornflower, crosswort, Green-winged Orchid.

Overall, the habitats at the Site are not well suited for wildflowers and there is a **negligible** chance that a diverse and important plant community could be present as a result of the garden management regime and improved soils. The wider landscape beyond the village provides suitable habitat for protected and notable plant species; such as the green-winged orchid, which is closely associated with meadow habitat, where the low fertility soils and annual cutting regime supports diverse communities of wildflowers. Similarly, species such as chicory, annual knawel, and cornflower are most often found in arable field margins, where the disturbance regime of arable farming creates favourable conditions for numerous wildflower species.

Invertebrates

The data search returned numerous records protected or notable invertebrates within the search area. These are species listed under Section 41 of the NERC Act (2006) and those listed under the Red List Data for Great Britain. Protected and notable species included: Grizzled Skipper, Small Heath, Large Garden (Ruderal) Bumblebee, Beaded Chestnut, Oak Hook-tip.

Overall, the garden area provides very limited habitat diversity and there is a **negligible** chance that it supports an important invertebrate population. The abundance of introduced shrubs may provide some enhanced foraging opportunities for pollinating insects at the Site, particularly plants such as honeysuckle *Lonicera spp*, that was growing on the side of the house; however, a diverse assemblage of native wildflowers and shrubs and good structural diversity of vegetation provide the greatest benefits to invertebrates. Invertebrates will not be addressed further in this report.

Fish

There were no records of fish in the data search, despite numerous aquatic habitats falling within the 2km search radius. There are no aquatic habitats on site and therefore there is a **negligible** chance that protected or notable fish species are present. Fish are not considered further in this report.

Amphibians

The data search returned a number of records common toad and common frog *Rana temporaria*. Thirteen records of great crested newt were returned, including one record within 500m from Houghton

village. However, the majority of records were associated with Houghton Meadows and Houghton Grange 0.8 and 1.km km away from the Site, respectively.

A search of Defra's MAGIC website found that four European Protected Species Licence had been granted for great crested newt within 2km of the site boundary. All licenses were great crested newt class survey licences, two of which were granted in the 2014, and two in 2015. The closest was 590 m west of the Site.

An Ordnance Survey map and aerial photographs were consulted for the presence of suitable waterbodies within 500m of the Site boundary and five ponds were found, the closest of which was 227 m north east of the site. There are several roads separating the Site form the nearby ponds which significantly reduces their connectivity. The Site contains very limited terrestrial habitat for great crested newt due to the garden management regime. Therefore, the presence of great crested newt at the site is deemed **negligible**. Furthermore, the proposed development will not result in any loss or disturbance to the garden habitat; as such, great crested newt is not considered further in this report.

Reptiles

The data search returned ten records of grass snake and a single record of common lizard, the majority of which were recorded in local County Wildlife Sites or SSSIs. Several records of grass snake within 1km of the site were present in the data search.

Some species of reptile, such as grass snake, slow worm and common lizard will visit gardens if suitable habitat is present, such as areas of unmown grass, ponds and compost heaps. The Site contains very limited suitable habitat for reptiles and the likelihood of their presence is considered to be **low.**

Birds

Nine species were recorded during the site visit and these are shown in Appendix 2. It is important to note that this is not a full inventory of species for the Site. House sparrow *Passer domesticus* was among the species recorded; this species is protected under Section 41 of the NERC Act (2006), listed as Red under BoCC and is a Cambridgeshire and Peterborough Priority Species.

The data search returned a numerous records of protected and notable bird species within the search area. These included species listed on Annex 1 of the Birds Directive, Schedule 1 of the Wildlife and Countryside Act 1981, Section 41 of the NERC Act (2006) and birds listed as Amber or Red under the Birds of Conservation Concern (Eaton et al., 2015).

Some passerine birds listed on the data search including house sparrow, starling *Sturnus vulgaris*, dunnock *Prunella modularis* and song thrush *Turdus philomelos* (which are listed as either Red or Amber on the BoCC Red List) have the potential to utilise buildings, trees and hedgerows onsite for breeding in low numbers.

Fieldfare *Turdus pilaris* and redwing *Turdus iliacus* were also present in the data search. Both species are protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) and are Red listed under the Birds of Conservation Concern (Eaton et al., 2015). These species are winter migrant to the southern parts of the UK and will often use garden hedgerows for food and shelter.

The hedgerow, scattered trees and building provide potential for nesting birds. The risk of breeding birds utilising the Site for nesting is considered to be **high** but the likelihood of the Site supporting important assemblages of birds is **negligible.**

Badger

The data search returned a number of records of badger within the search area. No evidence of badger activity was recorded onsite during the survey. The site does not provide suitable sett-building habitat and is not particularly well connected to suitable habitat. It is considered that the likelihood of badger regularly using the Site is **negligible** and is not considered further in this report.

Hedgehog

A number of records for hedgehog were returned within 2km of the Site. The garden and hedgerow habitats provide suitable foraging areas and shelter for this species. A dead hedgehog was found within the site boundary during the site visit; the presence of hedgehog is therefore **confirmed.** There is not anticipated to be any loss of garden habitat, as such there is no anticipated impacts to this species.

Other mammals

The data search returned three records of brown hare *Lepus europaeus*, eight records of otter *Lutra lutra* and one record of water vole *Arvicola amphibius* in the data search. The garden habitat is not suitable habitat for these species and they are not considered further in this report.

4.4. Preliminary Roost Assessment

The data search returned a number of records of bats from within the search area. This included multiple records of common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus*, noctule *Nyctalus noctula*, brown long-eared bat *Plecotus auritus* and Daubenton's *Myotis daubentonii*. There was a single record of serotine *Eptesicus serotinus* and a single record of Nathusius's pipistrelle *Pipistrellus nathusii.* This represents a typical species assemblage for Cambridgeshire, although a record of Nathusius's pipistrelle is notable for the region.

MAGIC map was consulted for any existing European Protected Species Licences for bats, and one license was retrieved within 2km of the Site boundary. The license was granted 1.9km west of the Site and was for the destruction of a soprano pipistrelle breeding site in 2014.

The garden habitats onsite provide suitable foraging habitat for bats and the hedgerow acts as a linear feature that could be used by commuting bats. However, set in the context of the wider area, the Site itself is unlikely to be of significance for foraging and commuting bats. As a result, there is a **low** risk of the Site supporting significant numbers of commuting and foraging bats.

The residential buildings within the village of Houghton will provide roosting opportunities for bats. As such, there is a **moderate** risk of the surrounding area supporting bat roosts.

Preliminary Roost Assessment summary

The results of the Preliminary Roost Assessment are shown in Figure 1.

The single storey residential building was confirmed to support roosting bats as 70-80 fresh droppings were found during the internal inspection of the attic space. There were a number of external access points and roosting features that could be used by crevice or void dwelling species.

The small wooden barn was found to be of low potential for roosting bats. No direct evidence was found during the internal inspection, however there were a number of features that had a low suitability to support crevice dwelling bats.

None of the trees onsite were deemed to be of roosting potential for bats.

Table 9 below outlines the results of the Preliminary Roost Assessment in more detail.

Table 9: Building inspection survey results

Building	Roost suitability	Description	Bat roost evidence and potential
Building 1: Single storey residential building	High	A single storey residential building with brick exterior and a clay tiled roof. The roof is constructed of wooden trusses and has a bitumen lining. The exterior has wooden soffits, which were well sealed.	There was an accumulation of 70-80 droppings, relatively fresh at the base of the chimney column at the western send of the attic space (Appendix 3: Photograph 3). A further five droppings were found on the sides of the chimney column. The droppings were medium to large in size and knobbly, consistent with those of brown long-eared bat. There was a suitable roosting cavity where the top of the chimney column meets the joint of the wooden trusses, which was located above the accumulation of droppings. A further 15 droppings were found throughout attic space, mostly underneath the ridge beam. There was adequate flying space within the attic. The building contained a small number of potential external access points for bats: • Lifted ridge tiles on the ridge between the north and west aspects of the roof (Appendix 3: Photograph 4). • Gaps under the roof tiles around the boiler exhaust.

Building	Roost suitability	Description	Bat roost evidence and potential
			• Lifted roof tiles close to the apex of the south aspect of the roof. • Gaps under the lead flashing and ridge tiles at the base of the chimney on the east aspect of the roof (Appendix 3: Photograph 5). • Missing roof tile on the south facing aspect of the eastern side of the building (Appendix 3: Photograph 6).
Building 2: Wooden barn	Low	A timber-framed barn with corrugated asbestos sheeting roof and a wooden cladded exterior.	No droppings were found inside the building and no other direct evidence of bats was found during the internal inspection. There were small a number of external access points and features of low suitability for roosting bats. These were: • Multiple gaps under the flashing along the ridge (Photograph 7). • Gaps in the wire mesh behind the vents, creating suitable access point to interior (Photograph 8).

5. ECOLOGICAL CONSTRAINTS, OPPORTUNITIES AND RECOMMENDATIONS

This section outlines key ecological issues for consideration, recommendations for further work and ecological enhancements where appropriate.

5.1. Ecological constraints

On-site habitats

A number of mature and semi-mature trees were present onsite. These are valuable features for local wildlife and should be retained and protected from accidental damage during works in line with policy LP31 (Huntingdonshire District Council, 2019).

Recommendation 1

Retain and protect mature and semi-mature trees from accidental damage during works in line with policy LP31 (Huntingdonshire District Council, 2019).

Native hedgerow habitat was present onsite. The native hedgerow onsite contained six UK native woody species and therefore qualifies as a Habitat of Principal Importance, due to its coverage and number of woody species. This habitat acts as an important ecological feature for a range of species including birds, bats and hedgehogs. It is recommended that the existing hedgerow habitat is retained, protected and enhanced.

Recommendation 2

Retain, protect and enhance the existing native hedgerow, which is a Habitat of Principal Importance.

Birds

There is suitable habitat available on site for breeding birds, including the scattered trees, hedgerow and climbers on the residential building. All wild birds, their active nests and eggs are protected under The Wildlife and Countryside Act 1981 (as amended), which makes it an offence deliberately, or recklessly, to kill or injure any wild bird or damage or destroy any active birds' nest or eggs.

It is anticipated that a minimal amount of vegetation removal will be required for the proposed renovation of the residential building and barn. Scheduling vegetation clearance and works to the buildings between the months of September and February inclusive (i.e. outside of the bird season) would avoid impacts on breeding birds and eliminate the need for nesting bird checks.

Where vegetation and building clearance works are required during the breeding bird season (between the months of March and August inclusive), such works can only proceed following the completion of a nesting bird check undertaken by an experienced ornithologist. Any active birds' nest identified during this check must be protected from harm until the nesting attempt is complete. This will require a buffer to be left around the nest, the size of which will depend upon the species involved (as a general rule, this will be 10m in all directions around the nest). Any buffers established as a result of the initial nesting bird check must be subjected to a second check after the original nesting attempt is completed, before such areas can be removed during the breeding bird season.

Recommendation 3

Schedule vegetation and building clearance works between the months of September and February inclusive to avoid impacts on breeding birds. Where this timing is not feasible works should be preceded by a nesting bird check.

It is strongly recommended that any potential nesting bird habitat is cleared outside the breeding bird season in order to avoid potentially lengthy delays if nests are found during nesting bird checks.

Bats

Direct evidence of roosting bats was recorded in the attic space of the residential building, along with a number of potential access points and roosting features. As such, the presence of roosting bats was confirmed.

No direct evidence of roosting bats was recorded in the wooden barn, however a small number of potential access points were present on the building's exterior and a small number of feature were present with low roosting suitability. Consequently, this building was deemed to be of low roosting suitability for bats

All bat species are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) and Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended) (see Appendix 1). Bats are also Species of Principal Importance listed on Section 41 of the NERC Act (2006). It is an offence to deliberately kill, injure or disturb a bat, damage or destroy a bat roost, intentionally or recklessly disturb a bat at a roost, or obstruct access to a roost.

The proposed renovation will affect the current attic space of the residential building, which is confirmed to support roosting bats. There is a risk that individual bats may be killed, injured or disturbed in their roosts during the works, and that bat roosts will be damaged or destroyed, without appropriate mitigation measures.

Further survey work is recommended to confirm the presence or absence of bat roosts in buildings with roosting potential. Best-practice guidelines (Collins, 2016) recommend three nocturnal surveys should be conducted on buildings with a high risk, and a single nocturnal survey for buildings with low risk.

If bats are present, these nocturnal surveys will determine the species, population size, type of roost and establish how the bats are using the structure. If a roost is discovered during the survey of the low risk building it may be necessary to conduct further nocturnal surveys (up to three most likely). These surveys can be conducted between May and August. Sub-optimal surveys can be undertaken in September. It is recommended that surveys are spaced at least two weeks apart.

Recommendation 4

Undertake a three nocturnal bat surveys on the residential building and a single nocturnal building of the barn.

To provide enhanced opportunities for roosting bats onsite post development, it is recommended that bat boxes are included within the design scheme and a dedicated 'bat attic' is included within one of the buildings on site. Detailed specifications and examples will be provided following the nocturnal survey effort.

Bat roosting behaviour, commuting and foraging activity can additionally be dramatically affected by artificial lighting (BCT, 2018). It is strongly recommended that any proposed exterior lighting on the new building is designed and managed appropriately to ensure that the area remains suitable for foraging bats. A sensitive lighting scheme should be developed to allow suitable roosting and foraging areas for bats. Direct lighting on mature trees and hedgerow habitat must be avoided.

Recommendation 5

Light pollution from exterior lighting should be minimised both during and after the construction phase. A sensitive lighting scheme should be developed to allow for suitable roosting and foraging areas for bats within the site with maximum use of appropriate luminaries and directed lighting. Direct lighting on mature trees and hedgerow habitat must be avoided.

Hedgehogs

The garden habitats and hedgerow onsite provide suitable habitat for hedgehog and the presence of hedgehog on site is confirmed. Hedgehogs are a Species of Principal Importance under the NERC Act (2006). Although the works are not expected to have any long-term impact on hedgehog, it is recommended that provisions are made for this species post-development to help deliver gains in biodiversity at the site, in line with local and national planning policy. This should include the installation of one hedgehog dome close to existing hedgerow habitat.

Fencing can impact on hedgehogs through the loss of habitat connectivity. If fences are to be installed as part of the proposed works, they should contain at least one 13cm x 13cm hole at the bottom of each fence, in order to maintain connectivity for hedgehogs.

Recommendation 6
Install one hedgehog dome close to existing hedgerow habitat.

Recommendation 7
Maintain habitat connectivity for hedgehog through the instalment of at least one 13cm x 13cm hole at the bottom of any fence, if they are to be installed.

5.2. Opportunities for biodiversity enhancement

Following the issue of the National Planning Policy Framework (NPPF; see Appendix 1), all planning decisions should aim to maintain and enhance, restore or add to biodiversity and geological conservation interests. Ecological enhancements should aim to deliver biodiversity gains for the proposed development site.

Planting of native species or those with a known attraction or benefit to local wildlife is recommended in landscape proposals. This will help to increase native plant species diversity, provide more ecologically valuable habitats, and result in a greater diversity of other dependent taxonomic groups.

The enhancement of existing hedgerow habitat along the boundaries is readily achievable at this Site. The existing hedgerow can be augmented with a greater diversity of UK native species, which provided year-round benefits to wildlife.

Recommendation 8
It is recommended that the existing hedgerow is augmented and enhanced with additional native British species to improve the overall value of the site for biodiversity, in line with the requirements of the NPPF. This could include a range of habitats although enhancement of the hedgerow habitat is likely to be readily achievable.

The grassland within the garden habitat onsite provides an opportunity to create a bee lawn that can act as an important resource for bumblebees and other insect pollinators, which in turn provides benefits for other species further up the food chain, including reptiles and bats. A bee lawn can be created by seeding the lawn with suitable plants such as selfheal *Prunella vulgaris* or bird's-foot-trefoil *Lotus corniculatus* and by reducing the mowing height and frequency.

Additionally, the creation of deadwood features at the site will be particularly valuable for invertebrates as a foraging resource, which in turn benefits a range of other species such as hedgehogs and reptiles.

This could include rotting roots or tree stumps spread around various locations. The drilling of holes or cutting of notches can add even more value for invertebrates.

Recommendation 9

Incorporate simple biodiversity enhancement measures at the site, including the creation of a bee lawn and provision of deadwood features.

Enhanced opportunities for breeding birds should be incorporated into the design scheme. Bird boxes should be mounted on trees, fences and built structures at the site. It is recommended that there is focus on starling *Sturnus vulgaris*, house sparrow *Passer domesticus* and swift *Apus apus,* together with the provision of generalist bird boxes. Both house sparrow and Starling are red-listed bird of conservation concern. Examples of suitable boxes are shown in Appendix 4 together with information concerning the correct siting of these enhancement features.

Recommendation 10

A minimum of four bird boxes should be installed at the site, to include provisions for starling, swift and house sparrow and generalist species.

The creation of a small wildlife pond is one of the most effective ways to improve biodiversity at the site, it will provide aquatic habitat for amphibians, invertebrates, and plants, in turn providing food resources for reptiles, birds and mammals. It will also serve as an important water source for a range of species and will attract wildlife to the Site form surrounding areas. Wildlife ponds should be planted with UK native species only to avoid the spread of invasive plant species, and should include a range of emergent and marginal vegetation. Additionally, native plant species offer the most benefits to UK native wildlife.

Recommendation 11

Create a small wildlife pond, planted with a range of UK native species, to include a range of emergent and marginal species.

Summary of recommendations

Table 10 below summarises the recommendations made within this report, and specifies the stage of the development at which action is required. Colour coding of cells within the table is as follows:

Key:

No action required for this species group at this stage

Action required (see notes for details)

Level of action required will be determined following the further survey work

Table 10: Summary of recommendations at Arkady, Thicket Road, Houghton

Species	Pre-planning action required?	Pre-construction action required?	Construction phase mitigation required?	Enhancements proposed?
Habitats	Incorporate native planting, pond and habitat creation into scheme Retention and protection of hedgerow and mature trees	No	Protect hedgerow and mature trees	Native planting, pond and habitat creation
Bats	Further survey work Sensitive lighting scheme	TBC	Implement sensitive lighting scheme	TBC
Birds	Bird boxes	No	Timing of works for vegetation removal Incorporate integrated bird boxes into new buildings	Bird boxes

Species	Pre-planning action required?	Pre-construction action required?	Construction phase mitigation required?	Enhancements proposed?
Hedgehog	Hedgehog domes Hedgehog highways if applicable	No	No	Hedgehog domes Hedgehog highways if applicable

6. CONCLUSIONS

A Preliminary Ecological Appraisal and Preliminary Roost Assessment survey was undertaken at Arkady, Thicket Road, Houghton in July 2021 by MKA Ecology Ltd on behalf of Devlin Architects Ltd. The proposal for the Site is to renovate the existing residential building and to convert the wooden barn into a separate residential unit.

A number of mature and semi-mature trees were present onsite and these should be retained and protected from accidental damage during works. A native hedgerow, a Habitat of Principal Importance, was present along the northern and eastern boundary of the Site. The works are not expected to impact this habitat, however enhancing this feature by augmenting with additional native species will help improve its value for biodiversity.

The potential protected species constraints that were identified in the Preliminary Ecological Appraisal relate to breeding birds, hedgehogs and bats. Works must take place outside of the breeding bird season (March to August inclusive) to avoid impacts on active birds' nests. Provisions for hedgehog will be incorporated within the design scheme.

The presence of bats was confirmed in the attic space of the residential building on account of numerous droppings being found. No direct evidence of bats was discovered during the inspection of the wooden barn, however a number of features with low roosting potential were present on the building. Further survey work has been recommended for bats to ascertain their presence or absence and to ascertain any potential impacts from the development. Three nocturnal surveys have been recommended for the residential building, due to the presence of dropping and suitable roosting features and a single nocturnal survey has been recommended on the wooden barn, as it was deemed to be of low potential for roosting bats.

Where roosting bats are present, mitigation options may be required to fulfil legal obligations and to ensure the continued conservation status of these species in the area. If present these species would require some careful management but it is unlikely that they would preclude the proposed renovation and barn conversion at the Site.

There are a range of measures that could be developed to promote biodiversity at the Site. The enhancement of existing hedgerow habitat, provision of bird boxes within the new build or on existing trees, the creation of a pond, bee lawn and deadwood features will all contribute to achieving both local and national biodiversity targets.

7. REFERENCES

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8. APPENDICES

8.1. Appendix 1: Relevant wildlife legislation and planning policy

Please note that the following is not an exhaustive list, and is solely intended to cover the most relevant legislation pertaining to species commonly associated with development sites.

Subject	Legislation (England)	Relevant prohibited actions
Amphibians		
Great crested newt *Triturus cristatus* Natterjack toad *Epidalea calamita*	Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended) Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	• Deliberately capture or kill, or intentionally injure; • Deliberately disturb or recklessly disturb them in a place used for shelter or protection; • Damage or destroy a breeding site or resting place; • Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection; and • Possess an individual, or any part of it, unless acquired lawfully.
Reptiles		
Common lizard *Zootoca vivipara* Adder *Vipera berus* Slow-worm *Anguis fragilis* Grass snake *Natrix helvetica helvetica*	Part of Sub-section 9(1) of Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill or injure individuals of these species (Section 9(1)).

Subject	Legislation (England)	Relevant prohibited actions
Sand lizard *Lacerta agilis* Smooth snake *Coronella austriaca*	Full protection under Section 9 of Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	• Deliberately or intentionally kill, capture (take) or intentionally injure; • Deliberately disturb; • Deliberately take or destroy eggs; • Damage or destroy a breeding site or resting place or intentionally damage a place used for shelter; or • Intentionally obstruct access to a place used for shelter.
Birds		
All wild birds	Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill, injure, or take any wild bird or their eggs or nests.
'Schedule 1' birds	Schedule 1 of the Wildlife and Countryside Act 1981 (as amended)	• Disturb any wild bird listed on Schedule 1 whilst it is building a nest or is in, on, or near a nest containing eggs or young; or • Disturb the dependent young of any wild bird listed on Schedule 1.
Mammals		
Bats (all UK species)	Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended)	• Deliberately capture, injure or kill a bat; • Deliberately disturb a bat (disturbance is defined as an action which is likely to: (i) Impair their ability to survive, to breed or reproduce, or to rear or nurture their young; (ii) Impair their ability to hibernate or migrate; or (iii) Affect significantly the local

Subject	Legislation (England)	Relevant prohibited actions
	Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	distribution or abundance of the species); • Damage or destroy a bat roost; • Intentionally or recklessly disturb a bat at a roost; or • Intentionally or recklessly obstruct access to a roost. In this interpretation, a bat roost is "*any structure or place which any wild [bat]...uses for shelter or protection*". Legal opinion is that the roost is protected whether or not the bats are present at the time.
Badger *Meles meles*	Protection of Badgers Act 1992	Under Section 3 of the Act: • Damage a sett or any part of it; • Destroy a sett; • Obstruct access to, or any entrance of, a sett; or • Disturb a badger when it is occupying a sett. A sett is defined legally as any structure or place which displays signs indicating current use by a badger (Natural England 2007).
Hazel dormouse *Corylus avellana*	Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended)	• Intentionally or deliberately capture or kill, or intentionally injure; • Deliberately disturb or intentionally or recklessly disturb them in a place used for shelter or protection; • Damage or destroy a breeding site or resting place;

Subject	Legislation (England)	Relevant prohibited actions
	Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Intentionally or recklessly damage, destroy or obstruct access to a place used for shelter or protection; and • Possess an individual, or any part of it, unless acquired lawfully.
Otter *Lutra lutra*	Schedule 2 of Conservation of Habitats and Species Regulations 2017 (as amended) Section 9(4)(b) and (c) of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Deliberately capture, injure or kill an otter; • Deliberately disturb an otter in such a way as to be likely to significantly affect the local distribution or abundance of otters or the ability of any significant group of otters to survive, breed, rear or nurture their young; • Intentionally or recklessly disturb any otter whilst it is occupying a holt; • Damage or destroy or intentionally or recklessly obstruct access to an otter holt.
Water vole *Arvicola amphibius*	Section 9 of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill, injure or take water voles; • Possess or control live or dead water voles or derivatives; • Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection; or • Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose.
Crustaceans		
White-clawed crayfish *Austropotamobius pallipes*	Section 9(1) of Schedule 5 of Wildlife and Countryside Act 1981 (as amended)	• Intentionally kill, injure or take white-clawed crayfish by any method.

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

Full legislation text available at: The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 (legislation.gov.uk)

The Wildlife and Countryside Act 1981 (as amended)

Full legislation text available at: http://www.legislation.gov.uk/ukpga/1981/69/contents.

Countryside and Rights of Way Act 2000

Full legislation text available at: http://www.legislation.gov.uk/ukpga/2000/37/contents

Protection of Badgers Act 1992

Full legislation text available at: http://www.legislation.gov.uk/ukpga/1992/51/contents

Section 41 of Natural Environments and Rural Communities (NERC) Act 2006

Full legislation text available at: http://www.legislation.gov.uk/ukpga/2006/16/section/41

Many of the species above, along with a host of others not afforded additional protection, are listed on Section 41 of the NERC Act 2006.

Section 41 (S41) of the Natural Environment and Rural Communities (NERC Act 2006) requires the Secretary of State to publish a list of habitats and species that are of principal importance for the conservation of biodiversity in England. The list (including 56 habitats and 943 species) has been drawn up in consultation with Natural England and draws upon the UK Biodiversity Action Plan (BAP) List of Priority Species and Habitats.

The S41 list should be used to guide decision-makers such as local and regional authorities to have regard to the conservation of biodiversity in the exercise of their normal functions – as required under Section 40 of the NERC Act 2006. The duty applies to all local authorities and extends beyond just conserving what is already there, to carrying out, supporting and requiring actions that may also restore or enhance biodiversity.

Schedule 9 of Wildlife and Countryside Act 1981 (as amended)

In addition to affording protection to some species, The Wildlife and Countryside Act 1981 (as amended) also names species which are considered invasive and require control. Section 14 of the Act prohibits the introduction into the wild of any animal of a kind which is not ordinarily resident in, and is not a regular visitor to, Great Britain in a wild state, or any species of animal or plant listed in Schedule 9 to the Act. In the main, Schedule 9 lists non-native species that are already established in the wild, but which continue to pose a conservation threat to native biodiversity and habitats, such that further releases should be regulated.

Wild Mammals (Protection) Act 1996

Full legislation text is available at: http://www.legislation.gov.uk/ukpga/1996/3/contents

Under this legislation it is an offence to cause unnecessary suffering to wild mammals, including by crushing and asphyxiation. It largely deals with issues of animal welfare, and covers all non-domestic mammals including commonly encountered mammals on development sites such as rabbits, foxes and field voles.

Birds of Conservation Concern (BoCC)

This is a quantitative assessment of the status of populations of bird species which regularly occur in the UK, undertaken by the UK's leading bird conservation organisations. It assesses a total of 246 species against a set of objective criteria to place each on one of three lists – Green, Amber and Red – indicating an increasing level of conservation concern. There are currently 52 species on the Red list, 126 on the Amber list and 68 on the Green list. The classifications described have no statutory implications, and are used merely as a tool for assessing scarcity and conservation value of a given species.

National Planning Policy Framework (NPPF)

Full text is available at: https://www.gov.uk/government/publications/national-planning-policy-framework--2

The revised NPPF was updated on 20 July 2021 setting out the Government's planning policies for England and the process by which these should be applied. The policies within the NPPF are a material consideration in the planning process. The key principle of the NPPF is a presumption in favour of sustainable development, with sustainable development defined as a balance between economic, social and environmental needs.

Policies 174 to 188 of the NPPF address conserving and enhancing the natural environment, stating that the planning system should:

- Contribute to and enhance the natural and local environment by protecting and enhancing valued landscapes;
- Recognise the wider benefits of ecosystem services; and
- Minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government's commitment to halt the overall decline in biodiversity.

Furthermore there is a focus on re-use of existing brownfield sites or sites of low environmental value as a priority, and discouraging development in National Parks, Sites of Specific Scientific Interest, the Broads or Areas of Outstanding Natural Beauty other than in exceptional circumstances.

Where possible, planning policies should also

“promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity”.

8.2. Appendix 2: Habitat species list

Please note that these lists are intended to be incidental records and do not constitute a full botanical survey of the site. Relative abundance is given using the DAFOR scale. Please see Table 2 for details.

Built up areas and gardens, u1

Common Name	Systematic Name	Relative abundance
Perennial rye-grass	*Lolium perenne*	D
Annual meadow-grass	*Poa annua*	A
White clover	*Trifolium repens*	F
Selfheal	*Prunella vulgaris*	F
Germander speedwell	*Veronica chamaedrys*	O
Ground-ivy	*Glechoma hederacea*	O
Wood avens	*Geum urbanum*	R

Scattered trees, 11

Common Name	Systematic Name	Relative abundance
Silver birch	*Betula pendula*	O
Walnut	*Juglans regia*	O
Apple	*Malus domestica*	O
Rowan	*Sorbus aucuparia*	O
Maple	*Acer spp.*	O
Pear	*Pyrus communis*	O
Butterfly-bush	*Buddleja davidii*	O
Plum	*Prunus domestica ssp. domestica*	O

Native hedgerow, h2a

Common Name	Systematic Name	Relative abundance
Beech	*Fagus sylvatica*	D
Hazel	*Corylus avellana*	O
Holly	*Ilex aquifolium*	O
Hawthorn	*Crataegus monogyna*	O

Common Name	Systematic Name	Relative abundance
Yew	*Taxus baccata*	R
Elder	*Sambucus nigra*	O
Ivy	*Hedera helix*	F
Red campion	*Silene dioica*	O
Garlic mustard	*Alliaria petiolata*	O
Yellow archangel	*Lamium galeobdolon*	O
Sweet woodruff	*Galium odoratum*	O

Bird species recorded onsite

Common name	Systematic name	S1 W&CA[1]	BoCC[2] Status	S41 SPI[3]	Local PrSp[4]
Woodpigeon	*Columba palumbus*		Green		
Sparrowhawk	*Accipiter nisus*		Green		
Carrion crow	*Corvus corone*		Green		
Blue tit	*Cyanistes caeruleus*		Green		
Wren	*Troglodytes troglodytes*		Green		
Blackbird	*Turdus merula*		Green		
Robin	*Erithacus rubecula*		Green		
House sparrow	*Passer domesticus*		Red	Yes	Yes
Goldfinch	*Carduelis carduelis*		Green		

8.3. Appendix 3: Site photographs

Photograph 1: *Built up areas and gardens, scattered trees – u1, 11*



Photograph 2: Other hedgerow h2b



Photograph 3: Accumulation of bat droppings at base of chimney column in the attic space of residential building.



Photograph 4: Lifted tiles along the ridge between north and west aspect.



Photograph 5: Lifted lead flashing and ridge tiles, eastern aspect of roof.



Photograph 3: lifted and missing tiles on south facing aspect of eastern side of residential building.



Photograph 4: Gaps under flashing on ridge of barn.



Photograph 5: Access point to barn through vents.



Photograph 9: Wooden barn (south facing aspect).



Photograph 10: Residential building (east facing aspect)



8.4. Appendix 4: Bird and bat box recommendations

Bird box recommendations

A large number of bird boxes are available, designed for the specific needs of individual species. These are normally either designed to be mounted onto trees, external walls or integrated into a building. In general, bird boxes should be mounted out of direct sunlight and prevailing winds, out of reach of predators, with suitable foraging habitat for the subject species close by. Bird boxes should also be left up over winter as they can provide useful roosting sites for birds in bad weather.

Nest boxes should be cleaned at the end of each bird breeding season. All nesting material and other debris should be removed from the box. It should then be scrubbed clean with boiling water to kill any parasites (avoid using any chemicals). Once the box is clean, it should be left to dry out thoroughly. Under the Wildlife and Countryside Act 1981 it is an offence to disturb breeding birds and therefore annual cleaning is best undertaken from October to January when there is no risk of disturbing breeding birds.

Generalist boxes

Boxes to attract garden birds and woodland breeding species such as tits, nuthatch, redstart and pied flycatcher can be placed in gardens, orchards, woodlands and a wide variety of other habitats. The species of birds attracted to the box will depend upon the size of the entrance hole (see table below).

Boxes should be fixed two to five metres up a tree or wall, out of the reach of predators such as domestic cats. Unless there are trees or buildings, which give permanent shelter, it is best facing between north and east.

General		
Example	**Description**	**Picture**
Bird Brick Houses Integrated bird box	http://www.birdbrickhouses.co.uk/brick-nesting-boxes/integrated-bird-box/ Integrated into outside skin of 75mm and most 3” brickwork courses. Comes with a variety of hole sizes to suit particular bird species.	
Entrance Hole	**Species**	

28mm	Blue-, Marsh-, Coal- and Crested Tit, Wren.	
34mm	Great-, Blue-, Marsh-, Coal- and Crested Tit, Nuthatch, Pied Flycatcher, House Sparrow	
40mm	Redstart and Black Redstart	
50m	Starling	
60m	Spotted Flycatcher	
Schwegler No. 1B General Purpose Nest box	www.schwegler-nature.com Suitable for various garden and woodland birds, created with different sized entrance holes to avoid competition between species. Other variations (e.g. 2M) can be free hanging, to deter predators.	

Entrance Hole	**Species**
26 mm	Blue-, Marsh-, Coal- and Crested Tit, possibly Wren. All other species are prevented from using the nest box due to this smaller entrance hole
32 mm	Great-, Blue-, Marsh-, Coal- and Crested Tit, Redstart, Nuthatch, Pied Flycatcher, Tree and House Sparrows.
Oval	Redstart; also used by species that nest in the diameter 32 mm boxes. However, because more light enters the brood chamber, it is preferred by Redstarts.

Starling boxes

Starlings are often found in areas where there are established pasture fields close to their roosting site, with further foraging provided by hedges close by.

The nest box should be placed at soffit/eaves level, or at a similar height on a tree, and should not be situated closer than 3m to the ground. Although Starlings do not defend a territory, boxes should be spaced at least several metres apart.

The ideal nest box for starlings is approximately 400mm (h) x 180mm (w) x 180mm (d) with a hole approximately 45mm in diameter.

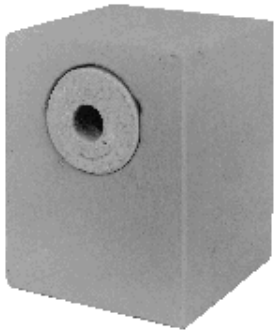
Starling		
Example	**Example**	**Example**
Woodstone starling nest	https://www.birdfood.co.uk/woodstone-starling-nest-box.html May also be attractive to woodpeckers but only as a roost site	
Schwegler Starling box 3S	www.schwegler-nature.com Can be mounted on buildings or trees, ideally out of direct sunlight.	

House sparrow boxes

House Sparrow typically nest in loose colonies of around 10-20 pairs and, as they do not defend a territory, boxes can be placed as close as 20-30cm apart. Several individual boxes can be placed together or a terrace (see below) can be installed. House Sparrow's typical range is less than 2km; however, during breeding season adult birds will forage within just 60–70 m metres of their nest site with residential gardens, with native deciduous shrubbery, trees and grassland being favourable foraging habitat

The brick design box can be incorporated into the building or attached the outside of the building. Ideally the box will be placed at soffit/eaves level or at least 2m high.

The ideal nest box for this species will be approximately 350mm (h) x 150mm (w) x 150mm (d) with a hole approximately 32mm in diameter.

House Sparrow		
Example	**Description**	**Picture**
Schwegler Brick Box Type 24	(www.schwegler-nature.com) This brick design can be built into the wall of the new development and the external surface, excluding the hole, can be rendered to match the surrounding wall.	
WoodStone Build-in House Sparrow Nest Box	www.nhbs.com This nest box is constructed from a mix of concrete and wood fibres. It is designed to be built into walls and is three brick high making it easy to incorporate into walls during construction or renovation. The front can be removed for cleaning or inspection.	

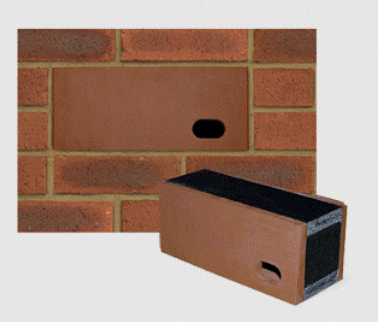
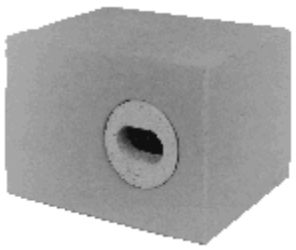
Swift

Swifts are colonial nesters and it is important to have several nest sites in one area. It is recommended that most buildings should have between 4 and 10 nest provisions. Swifts also feed almost exclusively on the aerial plankton of flying insects and airborne spiders of small to moderate size, so therefore require habitats which support these invertebrates.

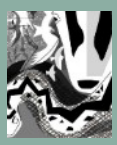
Nest boxes designed for swifts should be installed at least 5m high, around the eaves of the building or under deeply overhanging eaves to allow swifts to drop into the air to forage. The boxes should be positioned away from climbing plants to avoid access for predators such as rodents.

Swifts typically nest in flat spaces within buildings or within a crevice or cavity. The ideal nest box should have an oval or rectangular hole around 30mm (h) x 65mm (w). The internal dimensions of the box should be approximately 400mm (w) x 200mm (d) x 150mm (h).

Swifts can be attracted to areas that they have not previously colonised using 'swift response calls'. Audio CDs are available for this purpose and are available on the Schwegler website (www.schwegler-nature.com).

Swift		
Example	**Description**	**Picture**
Ibstock Swift Box	www.Ibstock.com This swift brick can be built into a wall on new buildings.	
Woodstone Build-in Swift Box	https://gardenature.co.uk This nest box is made from a concrete and wood fibre mix. It can be mounted on a wall, or it can be built into the fascia of a wall. The front of the Woodstone swift box can be removed for cleaning. It should be fitted at least 5 metres above the ground ensuring there is an unobstructed flight path for birds entering and leaving the box.	
Schwegler Brick Box Type 25	www.schwegler-nature.com This brick design can be built into the wall of the new development and the external surface, excluding the hole, can be rendered to match the surrounding wall.	

Swift		
Example	**Description**	**Picture**
Triple Genesis Swift Nest Box	https://www.wildcare.co.uk/ It can be mounted on an external wall to provide three swift nesting sites.	
Swift box model 30	http://actionforswifts.blogspot.com/p/diy-swift-box-designs.html This box is suitable for any location as it has a double thickness, waterproof roof (made of uPVC). The 30° sloping roof should deter predators.	
Schwegler Swift and Bat Box 1MF	www.schwegler-nature.com This box contains two nesting chambers for Swifts, each with its own entrance, allowing two pairs to breed. In addition, a recess in the rear panel creates a space between the wall of the building and box, making it ideal for bats that inhabit buildings, such as the Pipistrelle.	
Schwegler Swift Box Number 18	www.schwegler-nature.com This Swift Box No. 18 is ideally suited for creating Swift colonies under overhanging eaves.	



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