

**PRELIMINARY ECOLOGICAL  
APPRAISAL**

**at  
The Cottage  
Leeds  
West Yorkshire  
LS8 1NQ**

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**Date of Report:  
27/07/22**



## Quality Assurance

Version	Desktop Survey Completed:		Site Surveyed:		Report Completed:		Reviewed:	
	Date	Name	Date	Name	Date	Name	Date	Name
Planning	27/07/22	Audrey Bourdais Paull	18/07/22	Audrey Bourdais Paull + Helen Chambers	27/07/22	Audrey Bourdais Paull	28/07/22	Helen Chambers
							01/08/22	Adam West

This report has been prepared and provided in accordance with the *British Standard 42020: Biodiversity – Code of practice for planning and development 2018* and the *CIEEM's Code of Professional Conduct*.

Risk Assessment Completed	
Bio-security Procedure Completed	
Lone Worker Procedure Completed	



## Summary

JCA Limited has been commissioned by **ID Planning** to undertake a Preliminary Ecological Appraisal (PEA) of a site located at **The Cottage, Gledow, Leeds**. The site is located at Ordnance Survey (OS) National Grid Reference SE 31703 37164 with nearby postcode LS8 1NQ.

A desk study and field survey were undertaken in order to assess the potential of the site to support protected habitats and species and species of conservation concern. Recommendations for further survey, avoidance, mitigation and enhancement – where appropriate - have been made and are summarised in Table 1 on the following page and are detailed in full in Chapter 6 of this report.



Table 1: summary of ecological receptors at the site and recommended mitigation.

Receptor	Potential Risk to Project if No Action Taken	Cause of Impact Description of Effect	Further Survey Required	Mitigation Required
<b>Designated sites</b>				
Statutorily protected	Negligible	None	No	N/A
Non-statutorily protected	Negligible	None	No	N/A
<b>Protected species</b>				
Flora (WCA Sch 8, CHSR Sch 5)	Negligible	None	No	N/A
Invertebrates	Negligible	None	No	N/A
White-clawed crayfish	Negligible	None	No	N/A
Fish	Negligible	None	No	N/A
Great crested newt	Negligible	None	No	N/A
Reptiles	Low	The removal of favourable habitats including scrub and grassland habitats could adversely affect any reptile population of the area.	No	A precautionary approach should be adopted to include an Ecological Clerk of Works (ECoW) being present. Should a reptile be found during site clearance, the ecologist would move it to a place of safety. At present, no further surveys for reptiles are recommended.
Birds	High	The removal of any trees, shrub or scrub onsite has the potential to cause disturbance of breeding birds, resulting in a breach of legislation.	No	A preconstruction site walkover is required prior to any vegetation removal commencing. If removal occurs outside of the breeding bird period (1 <sup>st</sup> February until 31 <sup>st</sup> August) and birds are found, the removal must



				cease immediately, and a suitably competent ecologist contacted.
Bats	Moderate	The building has numerous potential roosting features (PRF). Potential for commuting and foraging bats onsite was identified. Any disturbance to bats or disruption to their roosts results in a breach of legislation. Inappropriate, obtrusive lighting on the development would affect the ability of bats to use the neighbouring LWS as a foraging and commuting habitat.	Yes – <b>two</b> bat surveys are required.	If roosting within the buildings is confirmed, a mitigation licence will be required. If trees are to be removed, a precautionary approach to felling should be adopted and any felled trees should be left where they fall for a minimum of 24 hours to allow any bats to vacate. Additionally, for artificial lighting within the development, guidance from Institution of Lighting Professionals (2018) should be followed. For artificial lighting within the development, guidance from Institute of Lighting Professionals (2018) should be followed.
Badgers	Negligible	None	No	N/A
Otters	Negligible	None	No	N/A
Water voles	Negligible	None	No	N/A
Other Species e.g. S41 species	Low	The removal of scrub onsite is favourable habitat of hedgehogs. Hedgehogs are legally protected during their	No	Any scrub to be removed should be hand searched immediately by a suitably qualified and experienced ecologist prior to removal, to ensure no hedgehogs



		hibernation period and while raising their young.		are currently nesting in the vegetation.
<b>Invasive Species (WCA Sch 9) Injurious Weeds (Weeds Act, 1959)</b>				
Rosa rugosa	Moderate	The spread of this Schedule 9 species under the WCA due to inappropriate management and handling, resulting in the unwanted spread to the wider environment and thus an offence would be committed.	None	Method statement for the safe management and removal of this Schedule 9 species.
<p>Key: S41 habitat/species – habitats and species listed as priority for conservation importance under Section 41 (S41) of the Natural Environment and Rural Communities (NERC) Act 2006.                      WCA Sch – Wildlife and Countryside Act 1981 (as amended) Schedule                      CHSR Sch – Conservation of Habitats and Species Regulations 2017 Schedule</p>				



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### Introduction

#### 1.1 Background

1.1.1 In July 2022, JCA Limited was instructed by **ID Planning** to undertake a Preliminary Ecological Appraisal (PEA) and Bat Scope of a site located at **The Cottage**, hereafter referred to as ‘the site’. The purpose of the survey is to establish a baseline of ecological information and assess whether the proposed works, hereafter referred to as ‘the scheme’, have the potential to adversely affect any protected or notable habitats or species.

#### 1.2 Scheme Description and Location

1.2.1 The site is located at Ordnance Survey (OS) National Grid Reference SE 31703 37164, with nearby postcode LS8 1NQ. The site is bordered to the north, south and west by residential properties and to the east by playing fields. Beyond residential properties, to the west is Gledhow Park and Lake.

1.2.2 The scheme is for the development of one residential dwelling with associated access, and alterations to the existing cottage.

#### 1.3 Aims and Objectives

1.3.1 The purpose of the survey is to establish a baseline of ecological information and assess whether the proposed development activities have the potential to adversely affect any protected or notable habitats or species. The following tasks have been undertaken:

- Desktop study – a review of environmental records for the surrounding area to obtain existing information on statutory and non-statutory designated sites of nature conservation interest, and the presence of protected and notable habitats and species within the site and its environs.
- Field surveys – an Extended Phase 1 Habitat survey involving a site visit to record habitat types and dominant vegetation, including any invasive species. During this survey evidence of protected or notable





fauna and habitats or habitat capable of supporting protected or notable fauna was recorded.

- Ecological report – an assessment of the potential ecological constraints to the proposed works at the site and recommendations for further survey, avoidance, mitigation, and enhancement where appropriate. Locations of any features constituting ecological constraints or of other ecological interest and vegetation recorded on and around the development are included in an accompanying Phase 1 Habitat Map (Appendix 1). This report and the maps are supported by photographs (Appendix 4) and information regarding current legislation (Appendix 8).
- Biodiversity Metric Baseline Assessment – condition scoring the habitats onsite and assigning each habitat a numerical value. This calculation is done in an excel worksheet, attached in Appendix 5.



## 2. Methodology

### 2.1 Desktop Study

2.1.1 The desktop study involved conducting database searches for statutory and non-statutory designated sites and European Protected Species (EPS) licensing applications within a 2km radius of the site. In addition, international sites designated for bats within 30km of the site were searched for. The baseline conditions are based on a review of existing available information including:

- MAGIC (Multi-Agency Geographical Information for the Countryside) website (to identify statutory designated sites and EPS licences).
- Ordnance Survey mapping (to identify potentially notable habitats including ponds).
- Aerial photography (to identify potentially notable habitats).
- Data search for records of protected/notable species on and within 2km of the site within the last ten years (exempting bat roosts, of which all records are included) obtained from West Yorkshire Ecology Services (WYES), the local environmental records centre for Leeds, along with information for non-statutory wildlife sites.

2.1.2 The records were checked against species listed as priority species under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and the Leeds Biodiversity Action Plan (LBAP) to assess national and regional habitat and species status.

### 2.2 Field Survey

2.2.1 A Phase 1 survey of the site was conducted on 18/06/22. All areas of the site were investigated and areas around the site where access permitted.

2.2.2 The vegetation and habitat types within the site were noted during the survey in accordance with the categories specified for a Phase 1 Vegetation and Habitat Survey (Joint Nature Conservation Committee, 2010). Dominant and abundant plant species were recorded for each habitat present.

2.2.3 The site was inspected for evidence of, and its potential to support, protected or notable species, especially those listed under the



Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019, the Wildlife & Countryside Act (WCA) 1981 (as amended), including those given a higher level of legal protection under the NERC Act 2006 and Countryside & Rights of Way (CRoW) Act 2000, and those listed on the LBAP. The following species were considered:

- Invertebrates (including white-clawed crayfish *Austropotamobius pallipes*).
- Great crested newt *Triturus cristatus* freshwater habitat potential within 500m of the site.
- Reptile habitat within the site.
- Nesting and foraging habitat for birds within the site.
- Bat roost potential and foraging habitat within the site.
- Badger *Meles meles* setts within 30m of the site, where accessible.
- Otters *Lutra lutra* and suitable habitat within 30m of the site, where accessible.
- Water vole *Arvicola amphibius* habitat within 20m of the site, where accessible.
- Other notable species.
- Invasive species.

2.2.4 The bat scope was planned and conducted with reference to Bat Surveys: Good Practice Guidelines 3rd Edition (Collins, 2016) and was conducted by experienced surveyors. The following equipment was used to ensure an accurate assessment; a printed site map, camera and binoculars.

2.2.5 Signs that bats have previously or are currently using a potential roost site include:

- Scratch marks, urine and oil stains around holes in buildings or trees.
- Droppings, carcasses and/or food remains found around the site.
- Bats observed flying in/out of a hole in a building or tree.
- Bats heard 'chattering' within a potential roost site, especially on warm summer days.



2.2.6 During the bat scoping survey, the building on site was subject to an external survey to establish the suitability of the structure to support roosting bats in accordance with Collins (2016). The interior was not accessible. The criteria for assigning a roost suitability category are presented in Table 2 below:

**Table 2:** Guidelines used for assessing the bat roosting suitability of a site (taken from Collins, 2016)

Roosting Suitability	Potential Roosting Features (PRFs) Present
<b>Negligible</b>	No visible features on the site likely to be used by roosting bats. No signs of bats found during the initial assessment.
<b>Low</b>	A structure with one or more potential roosting opportunities that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough shelter, protection, surrounding habitats, or the appropriate conditions to be used on a regular basis by larger numbers of bats e.g. unlikely to support hibernation or maternity roosts. A tree of sufficient size and age to contain features suitable for bat roosting, but with no features seen from the ground. No signs of bat use found during the initial assessment.
<b>Moderate</b>	A structure or tree with one or more potential roost sites that could be used by bats due to the size of the potential roosting feature which is sufficient to provide: shelter, protection, optimal conditions and surrounding habitats. The feature(s) are unlikely to support a roost of high conservation status. Signs (potential signs) of bat use found during the initial assessment.
<b>High</b>	A structure or tree with one or more potential roost sites that could be used by bats due to the size of the potential roosting feature which is sufficient to provide: shelter, protection, optimal conditions and surrounding habitats. The features have the potential to support large colonies of bats (e.g. maternity or hibernation) for long periods of time. Signs of bat use present.

2.2.7 The category of roosting suitability assigned to a feature is used to determine what further survey effort is required to ascertain the presence/likely absence of bats within that feature, as shown in Table 3 below:

**Table 3:** Recommended minimum number of survey visits for presence/likely absence surveys (taken from Collins, 2016).

Negligible suitability	roost	Low suitability	roost	Moderate suitability	roost	High suitability	roost
No further survey required		One survey visit. One dusk emergence or		Two separate survey visits. One dusk emergence		Three separate survey visits. At least one dusk emergence	



	dawn re-entry survey (structures). No further surveys required (trees).	and a separate dawn re-entry survey.	and a separate dawn re-entry survey. The third visit could be either dusk or dawn.
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## 2.3 Baseline Biodiversity Metric

2.2.8 A baseline biodiversity metric was carried out during the field survey on 18/07/22.

2.2.9 As of the recently passed Environment Act 2021, developments are now required to ensure a biodiversity net gain of at least 10%, which will be determined from the baseline biodiversity units. Should the development fall short of the required 10% biodiversity net gain, further enhancement and mitigative measures will be necessary.

2.2.10 The Biodiversity Metric 3.1 provides a way of measuring and accounting for biodiversity losses and gains resulting from development or land management change. The first calculation of the metric (included in this report) assigns a baseline numeric value for biodiversity units present onsite pre-development, assessed whilst onsite. A full metric would then determine whether the proposed development meets the target increase in biodiversity units.

2.2.11 The metric uses habitat features as a proxy measure for capturing the value and importance of nature, which are recorded during the survey. It uses a calculation that takes into account the importance of these features for nature: their size, ecological condition, location and proximity to nearby 'connecting' features. The metric enables assessments to be made of the present and forecast future biodiversity value of a site (Natural England, 2019).

## 2.4 Survey Constraints

2.3.1 To determine presence or likely absence of protected species usually requires multiple visits at suitable times of the year. As a result, the survey undertaken focused on assessing the potential of the site to support species of note, which are considered to be of principal importance for the conservation of biodiversity with reference to the National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2018), especially those given protection under UK wildlife legislation.



- 2.3.2 The optimum time of year for completing the survey is between April and September, as many plant species have a seasonal expression in spring and summer only. The survey was undertaken on 18/07/22.
- 2.3.3 The weather at the time of the survey and in the days previous had been dry and sunny, having little effect on field signs that could be present.
- 2.3.4 External areas of the building could be mostly assessed for points of entry. Internally, only one of the two loft spaces had hatch access and assess for roosting potential. The accessible loft had limited supporting beams, so a full examination of the loft was not possible. However, this was not considered to be a significant constraint on the validity of the survey findings as potential access points were identifiable and the precautionary principle will be applied.
- 2.3.5 The details of this report will remain valid for a period of 18 months. If works have not commenced within this period or land use on site changes, it is recommended that a new review of the ecological conditions is undertaken.



## 3. Desk Study Results

### 3.1 Statutory Designated Sites

3.1.1 The MAGIC website revealed no internationally designated sites within 2km of the site.

3.1.2 The MAGIC website revealed one nationally designated site within 2km of the site, Wykebeck Woods and Askett Hill Nature Reserve. It is designated for its biological importance and is located 1950m from the site.

### 3.2 Non-statutory Designated Sites

3.2.1 Records received from WYES revealed two non-statutory designated sites within 2km of the site, detailed in Table 2 below.

Table 2: Non-statutory designated sites within 2km of the site, returned from WYES.

Site Name	Distance (m) from Site	Reasons for Designation
Gipton Wood (LWS)	920m	Wd5 – good cover of <i>Hyacinthoides non-scripta</i> (bluebell)
Roundhay Woods (LWS)	1800m	Wd5 – high bluebell cover Wd3 – species-rich acid woodland Wd6 – neutral woodland, networks
Key: LWS – Local Wildlife Site		

### 3.3 Protected and Notable Species

#### 3.3.1 European Protected Species (EPS) Licence Applications

- The MAGIC website revealed two EPS licence applications within 2km of the site;
- a licence granted in July 2016 and ending in May 2017 to allow for the destruction of a resting place used by common pipistrelles. Licence reference: 2016-24514-EPS-MIT.
- a licence granted in April 2010 and ending in August 2011 to allow for the destruction of a resting place used by common pipistrelles. Licence reference: EPSM2010-1843.

#### 3.3.2 Records of Protected and Notable Species



### 3.3.3 Flora

17 records of bluebell *Hyacinthoides non-scripta*, a Schedule 8 (WCA, as amended) species, were returned by WYES. The most recent record was made in 2014, and the closest record was made 279m from the site.

### 3.3.4 Invertebrates (including white-clawed crayfish)

13 records of white-clawed crayfish *Austropotamobius pallipes*, a Schedule 5 (WCA, as amended), and a UKBAP, WYBAP and Leeds BAP species, were returned by WYES. All records were made in 2016, and the closest record was made 1899m from the site.

One record of shaded broad-bar *Scotopteryx chenopodiata*, a UKBAP and UKBAP species, was returned by WYES. The record was made in 2017, 689m from the site.

### 3.3.5 Fish

No protected or notable fish species were returned by WYES.

### 3.3.6 Amphibians

One record of common frog *Rana temporaria*, a UKBAP and Schedule 5 (WCA, as amended) species, was received from WYES. The record was made in 2017, approximately 573m from the site.

### 3.3.7 Reptiles

No protected or notable reptile species were returned by WYES.

### 3.3.8 Birds

The following records were received from WYES:

Table 3: Bird Records Received from WYES.

Scientific name	Common name	Designation	Latest Date	Number of records	Distance from site
<i>Carduelis cannabina</i>	Linnet	UKBAP, WYBAP	2017	2	1892
<i>Cuculus canorus</i>	Common cuckoo	S41, UKBAP, WYBAP	2013	2	309
<i>Dendrocopos minor</i>	Lesser spotted woodpecker	UKBAP, WYBAP	2013	5	309
<i>Turdus philomelos</i>	Song thrush	UKBAP, WYBAP	2013	1	344





Key:

S41: Section 41 of the NERC Act 2006

LBAP: Local Biodiversity Action Plan

### 3.3.9 Bats

The following records were received from WYES:

Table 4: Bat Records Received from WYES.

Scientific Name	Common Name	Designation	Latest Date	Number of records	Distance from Site (m)
<i>Myotis</i>	Unidentified <i>Myotis</i> spp	WCA Sch 5	2012	1	1992
<i>Nyctalus noctula</i>	Noctule bat	WCA Sch 5 S41 LBAP	2018	4	784
<i>Pipistrellus</i>	Pipistrelle bat	WCA Sch 5	2020	9	784
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	WCA Sch 5 S41 LBAP	2019	3	1272
<i>Vespertilionidae</i>	Unidentified bat	WCA Sch 5	2018	15	1214

Key:

WCA: Wildlife & Countryside Act 1981 (as amended)

S41: Section 41 of the NERC Act 2006

LBAP: Local Biodiversity Action Plan

### 3.3.10 Bat Roosts

The following records were received from WYES:

Table 5: Bat Records Received from WYES.

Scientific Name	Common Name	Roost type	Date	Distance from site (m)
<i>Pipistrellus</i>	Pipistrellus	N/A	2001	1,230
<i>Pipistrellus pipistrellus</i>	Pipistrelle	N/A	2019	743
<i>Pipistrellus pipistrellus</i>	Pipistrelle	N/A	2019	743
<i>Pipistrellus pipistrellus</i>	Pipistrelle	N/A	2019	743
<i>Pipistrellus pipistrellus</i>	Common pipistrelle	N/A	2003	976
<i>Pipistrellus pipistrellus</i>	Pipistrelle	N/A	2009	1,498



<i>Pipistrellus pipistrellus</i>	Pipistrelle	N/A	2012	1,953
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	N/A	2015	1,321
<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle	N/A	2019	1,272
<i>Pipistrellus sp.</i>	Pipistrelle bat species	N/A	2006	1,009
<i>Pipistrellus sp.</i>	Pipistrelle bat species	Maternity	1998	977
<i>Vespertilionidae</i>	Vesper bat species	N/A	2002	1,522
<i>Vespertilionidae</i>	Vesper bat species	N/A	2006	1,010
<i>Vespertilionidae</i>	Vesper bat species	N/A	2006	1,540
<i>Vespertilionidae</i>	Vesper bat species	N/A	2007	1,395
<i>Vespertilionidae</i>	Vesper bat species	N/A	1990	1,090
<i>Vespertilionidae</i>	Vesper bat species	N/A	2005	979
<i>Vespertilionidae</i>	Vesper bat species	N/A	1997	1,532
<i>Vespertilionidae</i>	Vesper bat species	N/A	2005	976
<i>Vespertilionidae</i>	Bats	Droppings (suggesting a roost)	2009	1,490
<i>Vespertilionidae</i>	Vesper bat species	N/A	1990	1,846

### 3.3.11 Badgers

No records of badgers or their setts were returned by WYES.

### 3.3.12 Otters

No records of otters were returned by WYES.

### 3.3.13 Water Voles

No records of water voles were returned by WYES.

### 3.3.14 Other Notable Species

One record of hedgehog *Erinaceus europaeus*, a UKBAP and WYBAP species, was received from WYES. The record was made in 2018, 427m from the site.

### 3.3.15 Invasive Species

The following species fall under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).



Four records of Japanese knotweed *Fallopia japonica* were received from WYES. The most recent record was made in 2018, and the closest record was made 503m from the site.

One record of Indian balsam *Impatiens glandulifera* was received from WYES. The record was made in 2016, 573m from the site.

One record of yellow archangel *Lamium galeobdolon* subsp. *Argentatum* was received from WYES. The record was made in 2013, 932m from the site.

One record of *Rhododendron ponticum* was received from WYES. The record was made in 2013, 279m from the site.

Four records of grey squirrel *Sciurus carolinensis* were received from WYES. The record was made in 2018, and the closest record was made 344m from the site.



## 4. Field Survey Results

### 4.1 Habitats

#### 4.1.1 G3 – Modified Grassland

A large area of the site is comprised of modified grassland, which is regularly mown. Species include orchard grass *Dactylis glomerata*, perennial ryegrass *Lolium perenne* and creeping buttercup *Ranunculus repens*.

#### 4.1.2 H2 – Hedgerow

Two hedgerows are present onsite. A common yew *Taxus baccata* hedgerow is present in the eastern corner of the large garden. Along the western border is a red western cedar *Thuja plicata* hedgerow.

#### 4.1.3 W1h7 – Line of Trees

Three lines of trees are present onsite.

A mature treeline is present within the scrub habitat along the southern boundary. Species include field maple *Acer campestre*, common hazel *Corylus avellana*, villous lilac *Syringa villosa*, dove tree *Davidia involucrata*, common yew, common juniper *Juniperus communis*, dog rose *Rosa canina*, and wych elm *Ulmus glabra*.

A fruit wall is present along the tall stone wall of the northern boundary. Species present include apple *Malus sp.* and pear *Pyrus sp.*

A line of fruit trees, including apple, pear, and a mature cherry tree *Prunus avium* is present.

#### 4.1.4 H3h – Mixed Scrub

An area of mixed scrub is present along the southern border of the site. Species include elmleaf blackberry *Rubus ulmifolius*, European dewberry *Rubus caesius*, male fern *Dryopteris filix-mas*, beauty bush *Linnaea amabilis*, common ivy *Hedera helix*, leatherleaf mahonia *Berberis bealei*, common foxglove *Digitalis purpurea*, Japanese barberry *Berberis thunbergii*, hedge bindweed *Calystegia sepium*, creeping bent *Agrostis stolonifera*, red vein dock *Rumex sanguineus*, orange daylily *Hemerocallis fulva*, curly dock *Rumex crispus*, cuckoo pint *Arum maculatum* and villous lilac *Syringa villosa*.

#### 4.1.5 U1 + 1160 – Introduced Shrub on Urban



There are two areas of introduced shrub onsite; along the eastern boundary of the smaller, courtyard garden, and along the western border to the right of the hedgerow. Species include holly *Ilex aquifolium*, tutsan *Hypericum androsaemum*, rugosa rose *Rosa rugosa*, hawthorn *Crataegus sp.*, *rodgersia sp.*, franchet's cotoneaster *Cotoneaster franchetii*, *Hydrangea sp.*, *rodgersia sp.* butterfly bush *Buddleja davidii*, fullmoon maple *Acer japonicum*, *Viburnum davidii*, Japanese skimmia *Skimmia japonica* and elm species.

#### 4.1.6 G3C + 231 – Vegetated Garden on Other neutral grassland

There is a large area of other neutral grassland in the northern half of the site, and a smaller area in the courtyard in the northeast corner of the site. These areas are assumed to be previously managed cottage/vegetated gardens which have now overgrown. Species include yellow daylily *Hemerocallis lilioasphodelus*, fringed willowherb *Epilobium ciliatum*, bristly oxtongue *Helminthotheca echioides*, African lily *Agapanthus sp.*, Welsh poppy *Papaver cambricum*, common box *Buxus sempervirens*, common wood sorrel *Oxalis acetosella*, perennial cornflower *Centaurea montana*, tutsan, common mullein *Verbascum thapsus*, ragwort *Jacobaea vulgaris*, China rose *Rosa chinensis*, endres cranesbill *Geranium endressii*, dragons blood *Sedum spurium*, *fuchsia sp.*, bush vetch *Vicia sepium*, evergreen candytuft *Iberis sempervirens*, field woodrush *Luzula campestris*, lesser London pride *Saxifraga cuneifolia*, wall lettuce *Mycelis muralis*, hairy willowherb *Epilobium hirsutum*, creeping phlox *Phlox stolonifera*, oxeye daisy *Leucanthemum vulgare*, grapeleaf anemone *Anemone tomentosa*, purple toadflax *Linaria purpurea*, common colombine *Aquilegia vulgaris*, hedge bindweed, chives *Allium schoenoprasum*, green alkanet *Pentaglottis sempervirens*, false shamrock *oxalis triangularis*, Himalayan honeysuckle *Leycesteria formosa*, common peony *Paeonia officinalis*.

#### 4.1.7 11 – Scattered trees

Lawson's cypress *Chamaecyparis lawsoniana*, common yew and apple trees are present in the western side of the garden.

#### 4.1.8 Buildings/structures

There are six buildings/structures on site. The main house, located on the eastern boundary, has been developed in various phases over several time periods, which is reflected through differing building materials. Although all connected, for clarity when describing potential roosting potential (BRP) (**Appendix 2, Bat Roosting Potential Map**), the main cottage – located on the eastern side of the site - has been labelled as buildings 1-3 (see also **669-BOW-**



**A1-ZZ-RP-0002-P4 - Design Supporting Document - 01 June 2022).** Table 6 below details building descriptions.

Table 6: descriptions of the buildings on site.

Building Number	Location	Description	Potential Roosting Features (PRFs)
1	Eastern boundary	The main cottage on site, connected to building 2 and 3 below. Stone built building with tiled roof. Large loft space with intact membrane, and two wasps' nests.	Innumerable gaps under the roof tiles which could afford access to the roof space (see <b>Appendix 4, photos 9 -11</b> )
2	Southeast corner	Stone built, flat roof porch extension and garage to building 1.	Roofing felt peeling off the vertical side of the building, which could afford bats access (see <b>Appendix 4, photo 12</b> )
3	Northeast corner	Stone built extension to building 1. Loft space inaccessible and not connected to Building 1.	Large gap in the tiles where building 4 joins onto building 3 (see <b>Appendix 4, photo 13</b> ).
4	Northern boundary	Large summerhouse built on a brick foundation. The sides are comprised of double-glazed doors with the roof is a PVC sheet. An established grape vine <i>Vitis vinifera</i> is present.	Negligible – no suitable roosting opportunities within the structure observed.
5	Northeast corner	Small, open work shed with a flat roof.	Negligible – no potential access points observed.
6	Southwest corner	Wooden summer house.	Negligible – no potential access points observed.

## 4.2 Protected and Notable Species

### 4.2.1 Flora

Generalist flora species were identified onsite, however no evidence of protected or notable flora were identified. Flora will, therefore, not be mentioned further in this report.

### 4.2.2 Invertebrates (including white-clawed crayfish)

Opportunity for generalist invertebrate species was identified onsite. However, no protected or notable invertebrates were identified onsite, or the potential to support such species; the site being largely out of the geographical range of most protected invertebrates' distribution and not containing any specific plant species required by specialist invertebrates. Invertebrates will, therefore, not be mentioned further in this report.



#### 4.2.3 Fish

No suitable habitat to support notable or protected fish species was identified onsite. As such, fish will not be mentioned further in this report.

#### 4.2.4 Amphibians

No suitable habitat to support notable or protected amphibians was identified onsite. As such, fish will not be mentioned further in this report.

#### 4.2.5 Reptiles

The site provides suitable habitat for reptiles through a mosaic of habitats, including scrub, shrub, and grassland habitats. These habitats may provide reptile species with foraging, basking and resting sites. No evidence of reptiles was seen onsite.

#### 4.2.6 Birds

The site provides high nesting potential for birds in the form of the trees, scrub and shrub. Additionally, birds could be found utilising the site for commuting and/or foraging purposes, particularly with the grassland habitat the site offers. No WCA Schedule 1 species were identified onsite.

#### 4.2.7 Bats

Buildings 1-3 on site have moderate potential to support roosting bats through multiple PRFs such as the presence of numerous raised roof tiles and a gap within the roofing felt.

The trees on site showed no evidence of holes or crevices, therefore holding low negligible bat roosting potential.

#### 4.2.8 Badgers

No signs of badger activity or setts were noted during the survey; however the scrub habitat present is typical commuting and/or foraging habitat for badgers.

#### 4.2.9 Otters

No suitable habitat to support otters was identified onsite. As such, otters will not be mentioned further in this report.

#### 4.2.10 Water Voles



No suitable habitat to support water voles was identified onsite. As such, water voles will not be mentioned further in this report.

#### 4.2.11 Other Notable Species

The site holds the potential to support hedgehogs due to the presence of favourable scrub and shrub habitat.

#### 4.2.12 Invasive Species

*Rosa rugosa*, a Schedule 9 (WCA, as amended) species, was identified onsite within the introduced shrub habitat.

### 4.3 Baseline Biodiversity Metric

4.3.1 A Biodiversity Metric 3.1 baseline calculation has been undertaken as to fully inform this assessment. The calculation has been processed in a Microsoft Excel workbook, which accompanies this. However, a summary of the main findings is provided below.

4.3.2 The total habitat area of the site is 1497m<sup>2</sup>, consisting of modified grassland, other neutral grassland, mixed scrub, introduced shrub, hedgerows, lines of trees, developed land; sealed surface, buildings and urban trees. The resulting ecological baseline is returned at **1.4 total habitat units** (see Appendix 5).





## 5. Assessment

### 5.1 Designated Sites

#### 5.1.1 Statutory designated sites

There are no statutory sites within 2km of the site.

#### 5.1.2 Non-statutory designated sites

Both non-statutory sites are close to or over 1km away, and not are deemed vulnerable to adverse impacts from the proposed development due to the distance to the designated sites, the limited connecting habitats, and the medium-scale nature of the proposed development.

### 5.2 Habitats

5.2.1 The most valuable habitats for biodiversity within the development site boundary are trees, scrub, shrub and hedgerows. The proposed works will impact two lines of line of trees along the northern boundary of the site, the yew hedgerow and shrub in the northeastern corner of the site by their removal.

5.2.2 The other habitats described in Chapter 4, Section 4.1 have lower biodiversity and provide less opportunity to support protected or notable species. The flora recorded in these habitats is considered to be locally common and widespread and they do not fall into any of the NERC S41 or Local BAP Priority Habitat descriptions.

### 5.3 Protected and Notable Species

#### 5.3.1 Reptiles

As favourable habitat for reptiles was noted onsite, should any enhancement work include the removal of vegetation, the following guidance should be followed to minimise the impact on any potential reptile population (see **Section 6.2.1**).

#### 5.3.2 Birds

The scattered tree habitat, scrub and introduced shrub were deemed to hold high nesting bird potential. If vegetation clearance to facilitate development



takes place within the bird nesting season (1<sup>st</sup> February to 31<sup>st</sup> August), nesting bird populations may be negatively impacted (see **Section 6.2.2**).

### 5.3.3 Bats

The data search revealed five protected species of bats from WYES and seven roosts records within 1km of the site boundary. The trees are afforded negligible roosting potential, and buildings 1-3 are afforded **moderate** potential. As modifications to the existing cottage are expected, bat surveys would be required to determine presence/likely absence of any roosts before works begin (further recommendations are explained in **Section 6.2.3**).

Furthermore, the site may offer moderate value foraging habitat through a range of flora species and the invertebrate population that the vegetation is likely to support. In addition, the site provides good commuting zones to the surrounding good quality foraging areas including the non-statutory designated sites within the 2km radius.

### 5.3.4 Other Notable Species

The dense scrub and brash piles on site provide suitable habitat for nesting and hibernating hedgehogs. Hedgehogs could be killed or injured during removal of these habitats (see **Section 6.2.4**).

### 5.3.5 Invasive Species

Rugosa rose is present within the introduced shrub habitat. The removal of this species will be of ecological benefit to the site and will require method statements (see **Section 6.2.5**).



## 6 Recommendations

### 6.1 Habitats

- 6.1.1 Biodiversity Enhancement Plan: A Biodiversity Enhancement Plan should be designed pre-construction to be implemented post construction during the landscaping phase of the development. This would be performed alongside the Biometric 3.1 Calculation that is required by all developments to demonstrate a biodiversity net gain of at least 10% post development. The biodiversity enhancement plan will provide opportunities for local wildlife and aim to retain or enhance LBAP priority habitats, to ensure the development does not have a significant detrimental impact on local or national wildlife populations.
- 6.1.2 It is recommended that a tree Development Survey be conducted on site prior to any tree removal. This will further identify the trees on site, assess the impact of the proposed development on the trees present, and offer recommendations for tree preservation.
- 6.1.3 Trees should be retained but, if this is not feasible, the number of felled trees must be replaced with native species of local provenance on a three-for-one-basis.

### 6.2 Protected and Notable Species

#### 6.2.1 Reptiles

It is advised that a precautionary approach is adopted to include an Ecological Clerk of Works (ECoW) being present prior to works commencing. The ECoW would give a toolbox talk to onsite contractors in order to relate applicable legislation, what signs to look for, and what to do should reptiles be encountered on site. Should a reptile be found during site clearance, the ecologist would move it to a place of safety. At present, no further surveys for reptiles are recommended.

#### 6.2.2 Birds

The vegetation onsite provides high nesting potential for breeding bird species. In the UK, the key breeding period for birds is from 1<sup>st</sup> February until 31<sup>st</sup> August (depending on species and behaviour). A preconstruction site walkover no more than 24 hours prior to any vegetation removal is required, and if removal occurs



outside of the breeding bird period and birds are found, the removal must cease immediately, and a suitably competent ecologist contacted.

### 6.2.3 Bats

Buildings 1-3 have been given **moderate** roosting potential and as such, emergence/re-entry surveys are required to ascertain the presence/likely absence of roosting bats. **Two** surveys are required, one dusk emergence survey and one dawn re-entry survey, of which at least one survey is undertaken between May and August. If a roosting activity is identified, a third survey will be required to accurately characterize the roost.

Artificial light is known to deter bats from entering lit areas. Therefore, the development must incorporate a wildlife sensitive lighting scheme. In particular, obtrusive light is to be prevented from reaching potential foraging and commuting routes, both from new exterior and interior lights. Guidance published by the Institution of Lighting Professionals (2018) is to be followed when designing the lighting scheme for the development.

It is important to avoid:

- Uniform levels of luminance across the site.
- Metal halide and florescent lighting.
- Upward tilting lighting that increases skyline luminance.

Instead, the following should be installed:

- Dark buffer zones.
- Screening in the form of vegetation, fences and structures.
- Appropriately designated darkened areas.
- Luminaries absent of UV elements.
- LED luminaries with a sharp cut-off, low intensity and good rendition.
- A warm white spectrum (<2700 kelvin) to reduce blue light.
- Peak luminaire wavelength at a minimum of 550nm.
- Downward directional luminaires with upward light ratios of 0%.



- Lower light columns to limit light spill.
- Recessed internal light fixtures.
- Window glazing treatments or automated blind systems.

#### 6.2.4 Other notable species

The vegetation and brash piles onsite provide ideal nesting habitats for hedgehogs, which are legally protected during hibernation and while raising their young. Any dense vegetation or piles to be removed should therefore be hand searched immediately prior to removal by a suitably qualified and experienced ecologist to ensure no hedgehogs are currently nesting in the vegetation.

The construction of any walls or fences included within the proposed development will reduce the movements of hedgehogs locally. This through creating localised habitat fragmentation for the species. Hedgehog holes measuring a minimum of 13cm x 13cm must be installed within any newly created walls or fences. Hedgerows permitting hedgehog commuting can be used alternatively to artificial barriers within the development.

#### 6.2.5 Invasive species

Through the presence of rugosa rose, an invasive weed method statement will be required to provide details on the safe removal of this INNS. The removal of this species would be of ecological benefit. In addition to this, to prevent any invasive species being planted within the newly established sites, all soft planting should be of native provenance.



## 7 References

### Guidelines for surveys and report writing:

British Standards Institute (BSI), (2013) *BS 42020:2013, Biodiversity - Code of practice for planning and development*. London.

Chartered Institute of Ecology and Environmental Management (CIEEM), (2015) *Guidelines for Ecological Report Writing*. Winchester.

Joint Nature Conservation Committee (JNCC), (2010) *Handbook for Phase 1 habitat survey: A technique for environmental audit*.

### Websites:

Advice on protected species is consolidated at:

*Environmental management: Wildlife and habitat conservation - GOV.UK* (2016) *Gov.uk*. Available at: <https://www.gov.uk/topic/environmental-management/wildlife-habitat-conservation>

*Magic Map Application* (2016) *Magic.defra.gov.uk*. Available at: <http://magic.defra.gov.uk/MagicMap.aspx>

*The RSPB* (2016). Available at: <http://www.rspb.org.uk/>

*Surveys and mitigation plans: protected species - Detailed guidance* (2015) *Gov.uk*. Available at: <https://www.gov.uk/guidance/surveys-and-mitigation-plans-protected-species>

Within this detailed guidance on surveys and mitigation information is available on the following protected species:

- Bats
- Natterjack toads
- Otters
- Reptiles
- Water voles
- White-clawed crayfish
- Wild birds
- Hazel dormice
- Great crested newts
- Badgers

*Wildlife licences: when you need to apply - Detailed guidance* (2014) *Gov.uk*. Available at: <https://www.gov.uk/guidance/wildlife-licences>

Within this detailed guidance on licensing information is available on licences for the following protected species:

- Bats
- Natterjack toads
- Otters
- Reptiles
- Water voles
- White-clawed crayfish
- Wild birds
- Hazel dormice
- Great crested newts
- Badgers

As well as:

- Non-native Bumblebee species
- Deer
- Freshwater fish
- Invertebrates
- Mink, coypu, muskrat and grey squirrel
- Plants

### Species Specific Information:



### **Badgers:**

Natural England, (2007) *Badgers and Development: A Guide to Best Practice and Licensing*.

Competencies for Species Survey: Badger, Chartered Institute of Ecology and Environmental Management CIEEM, 2013

### **Bats:**

Bat Conservation Trust, (2007) *Bats, Development & Planning in England*. London.

Bat Conservation Trust and Institute of Lighting Professionals (2018) *Guidance Note 08/18: Bats and artificial lighting in the UK*. ILP, Rugby

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

Mitchell-Jones, A.J. & McLeish, A.P. (2012) *The Bat Workers' Manual*. Pelagic Publishing, Exeter.

Bats: surveys and mitigation for development projects, <https://www.gov.uk/guidance/bats-surveys-and-mitigation-for-development-projects> Accessed 2018-06-21

### **Dormice:**

Bright, P., Morris, P. and Mitchell-Jones, A. (1996) *The dormouse conservation handbook*. Peterborough: English Nature.

### **Great Crested Newts:**

Langton, T., Beckett, C. and Foster, J. (2001) *Great Crested Newt Conservation Handbook*. Halesworth: Froglife. pdf

Advice note 4 (revised) - *Amphibian Disease Precautions, A Guide for UK Fieldworkers*, Amphibian and Reptile Conservation trust, 2017. Accessed 2018-06-21

**Otters:** Natural England, (2007) *Species Information Note SIN006, Otter: European protected species*.

### **Reptiles and Amphibians:**

Baker, J., Beebee, T., Buckley, J., Gent, T. and Orchard, D. (2011) *Amphibian Habitat Management Handbook*. 1st ed. Bournemouth: Amphibian and Reptile Conservation.

Edgar, P., Foster, J. and Baker, J. (2010) *Reptile Habitat Management Handbook*. 1st ed. Bournemouth: Amphibian and Reptile Conservation.

English Nature, (2004). *Reptiles: guidelines for developers*. Peterborough.

Gent, T. and Gibson, S. (ed.) (2003) *Herpetofauna Workers Manual*. Bournemouth: JNCC.

### **Water Voles:**

Natural England, (2008) *Water voles - the law in practice. Guidance for planners and developers*.



*Water Vole Conservation and Management: Lessons From Four Case Studies*, Jemma Louise Gaskin, 2016

Stoddart, D.M. (1970), *Individual range, dispersal in a population of water voles (Arvicola terrestris (L.))*. *Journal of Animal Ecology* 39, 403-425.

Strachan, R. (2009), *Populations and Persistence – Developing a Strategy for Conserving Water Voles in the UK*, Presentation to Warwickshire Wildlife Trust, 2nd April 2009, Environment Agency, Wales

Strachan, R. and Holmes-Ling, P (2003), *Restoring water voles and other biodiversity to the wider countryside*. Wildlife Conservation Research Unit, Oxford.

Strachan, R., Moorehouse, T. and Gelling, M. (2011), *Water Vole Conservation Handbook*, 3rd Edn, WILDCRU

### **White-clawed Crayfish:**

Peay, S. (2002) *Guidance on Habitat for White-clawed Crayfish and its Restoration*. Kendal: English Nature

### **Relevant Legislation:**

*Wildlife and Countryside Act 1981*, (c. 69) (as amended). Available at: <http://www.legislation.gov.uk/ukpga/1981/69>

*Countryside and Rights of Way Act 2000* (c.37). Available at: <http://www.legislation.gov.uk/ukpga/2000/37/contents>

*The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019*. Available at: <https://www.legislation.gov.uk/ukdsi/2019/9780111176573>

*Conservation of natural habitats and of wild fauna and flora Council Directive (92/43/EEC) (The Habitats Directive)* (as amended) Available at: <http://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:31992L0043>

*Protection of Badgers Act 1992* (c. 51). Available at: <http://www.legislation.gov.uk/ukpga/1992/51/contents>

*The Hedgerow Regulations 1997* (No. 1160). Available at: <http://www.legislation.gov.uk/uksi/1997/1160/contents/made>



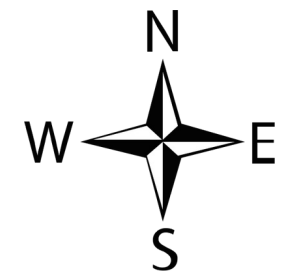
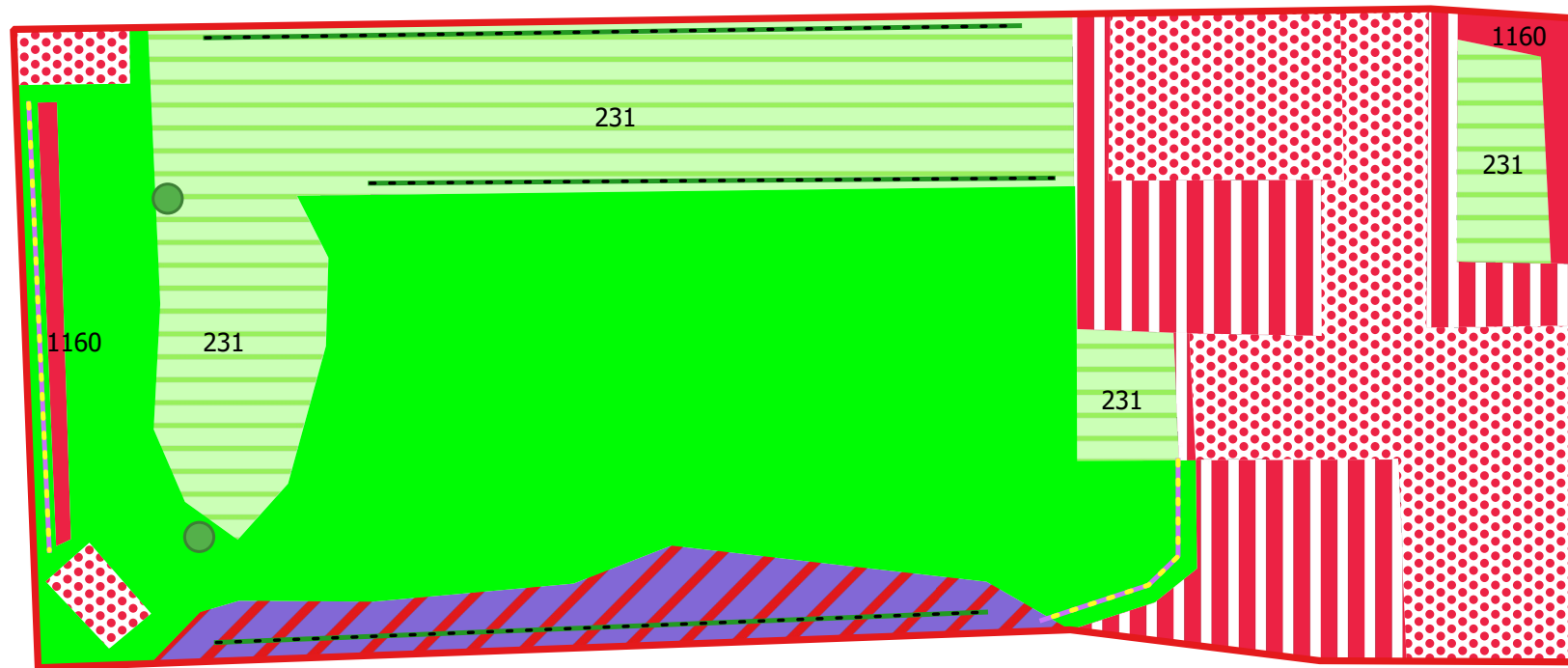


# Appendices

## Appendix 1: Phase 1 Habitat Map

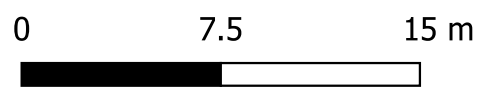


# Phase 1 Habitat Map for The Cottage



**Key:**

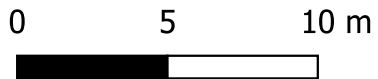
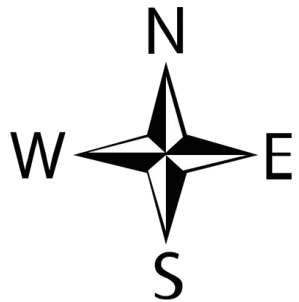
- Boundary
- Line of Trees
- Urban Trees
- Hedgerow
- Building
- Developed Land; Sealed surface
- Mixed Scrub
- Modified grassland
- Other neutral grassland
- 231 - Vegetated garden
- Urban
- 1160 - Introduced shrub



## Appendix 2: Bat Roosting Potential Map



# Bat Roosting Potential map for The Cottage

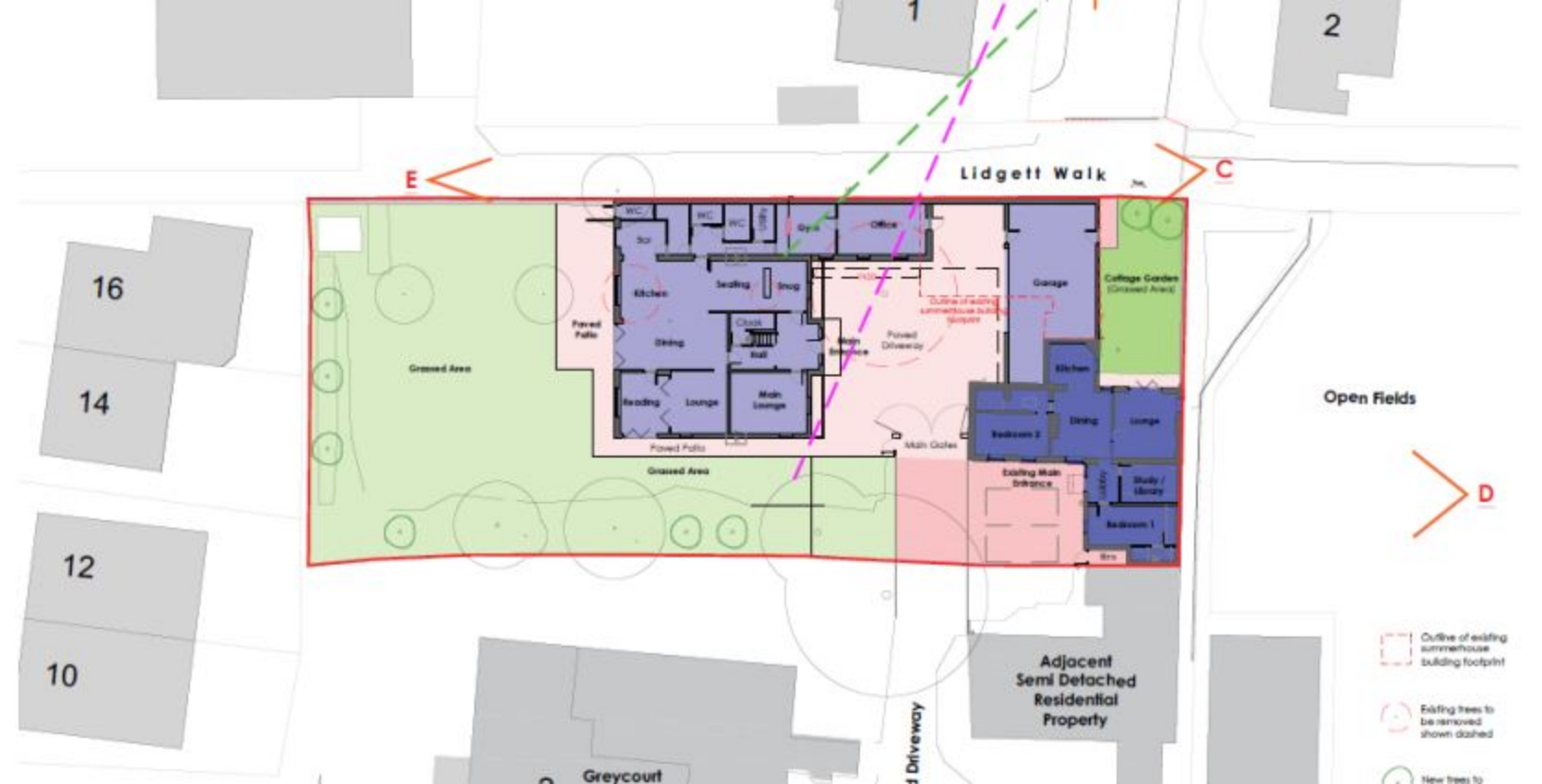


**Key**

- Site Boundary
- Bat Roosting Potential**
  - Gap in roofing felt
  - Gaps under tiles
- Buildings surveyed 1-6

## Appendix 3: Proposed Development Plan





E

Lidgett Walk

C

16

14

12

10

Grassed Area

Grassed Area

Open Fields

D

Adjacent  
Semi Detached  
Residential  
Property

Greycourt

Driveway

Outline of existing  
summerhouse  
building footprint

Existing trees to  
be removed  
shown dashed

New trees to

## Appendix 4: Photographic Evidence



Photo 1: Line of trees present on the southern border of the site (right), lawn and The Cottage buildings.

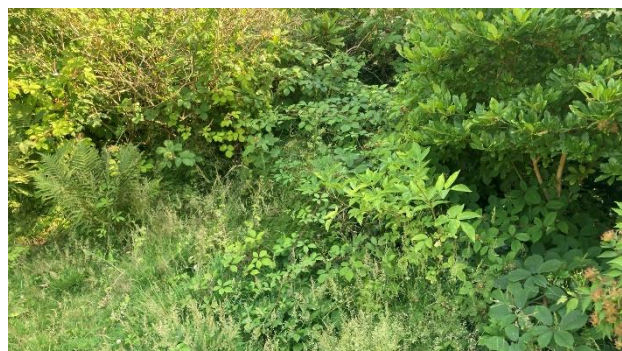


Photo 2: Scrub present on the southern border of the site.



Photo 3: The small courtyard in the northeast corner of the site. Introduced shrub and other neutral grassland with vegetated gardens is present.



Photo 4: Rugosa rose within introduced shrub.



Photo 5: Fruit trees along the tall stone wall and running along the edge of the lawn.



Photo 6: Section of hedgerow onsite.







Photo 7: Hedgerow and shrub on the western border of the site.



Photo 8: Line of trees within the scrub habitat, with a view of the west of the site.



Photo 9: Gaps in the tiles on building 1.



Photo 10: Innumerable gaps on buildings 1 and 3.



Photo 11: Large gap in tile on building 1



Photo 12: Gap in the roofing felt present building 2.





Photo 13: The summer house connected to the cottage, with the large gap present where the buildings meet.

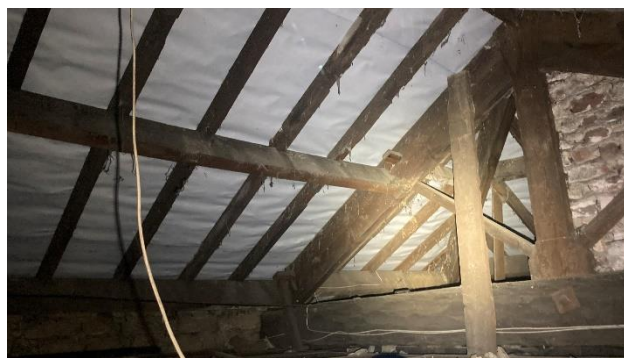


Photo 14: Loft space in building 1.



Photo 15: Visible but inaccessible area of loft space in building 3



## Appendix 5: Biodiversity Metric Workbook



**1a. Baseline habitats**

Ref	Habitat		C. Strategic significance	Areas M sq			Baseline results		
	A. Broad Habitat	B. Habitat type		D. Total Area	E. Area retained	F. Area enhanced	Total habitat units onsite	Area Lost	Units lost
1	Grassland	Modified grassland	Area not in local strategy	600			0.2400	600	0.2400
2	Grassland	Other neutral grassland	Area not in local strategy	20			0.0160	20	0.0160
3	Grassland	Other neutral grassland	Area not in local strategy	314			0.2512	314	0.2512
4	Grassland	Other neutral grassland	Area not in local strategy	29			0.0232	29	0.0232
5	Heathland and shrub	Mixed scrub	Area not in local strategy	86			0.0688	86	0.0688
6	Urban	Introduced shrub	Area not in local strategy	12			0.0024	12	0.0024
7	Urban	Introduced shrub	Area not in local strategy	17			0.0034	17	0.0034
8	Urban	Developed land; sealed surface	Area not in local strategy	163			0.0000	163	0.0000
9	Urban	Developed land; sealed surface	Area not in local strategy	256			0.0000	256	0.0000
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
Trees	Urban	Urban Tree	Area not in local strategy	14	0	0	0.0109	14	0.0109
<b>Totals (areas excl Trees)</b>				<b>1497</b>	<b>0</b>	<b>0</b>	<b>0.6159</b>	<b>1497</b>	<b>0.6159</b>
Error Check 1				Areas Acceptable					
Error Check 2				Areas Acceptable					
Error Check 3				Areas Acceptable					

**1.d - Urban Tree Area Calculator**

Tree size (Diameter at breast height)	A. Total number of trees pre development	B. Number of trees lost to development	C. Number of trees retained & enhanced post development	D. Number of new trees planted post development	Areas			
					Area pre development	Area lost to development	Area Enhanced by development	Area of new trees planted post development
Small -DBH 10cm	3	3			14	14	0	0
Medium - DBH 30cm					0	0	0	0
Large DBH - 50cm					0	0	0	0
<b>Total</b>	<b>3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>14</b>	<b>14</b>	<b>0</b>	<b>0</b>

**1a. Baseline habitats**

Ref	Habitat		C. Strategic significance	Length M			Baseline results		
	A. Broad Habitat	B. Habitat type		D. Total Length	E. Length retained	F. Length enhanced	Total units onsite	Length Lost	Units lost
1	Line of Trees	Line of Trees (Ecologically Valuable)	Area not in local strategy	32			0.2560	32	0.2560
2	Line of Trees	Line of Trees	Area not in local strategy	27			0.1080	27	0.1080
3	Line of Trees	Line of Trees	Area not in local strategy	30			0.1200	30	0.1200
4	Hedgerow	Hedge Ornamental Non Native	Area not in local strategy	17			0.0000	17	0.0000
5	Hedgerow	Native Hedgerow	Area not in local strategy	10			0.0400	10	0.0400
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									
<b>Totals</b>				116	0	0	0.5240	116	0.5240
<b>Error Check 1</b>				Lengths Acceptable					

## Appendix 6: Bat Survey Calendar

**Figure 1:** Survey timings calendar (taken from BCT: Bat surveys for professional Ecologists, Good Practice Guidelines; 3<sup>rd</sup> Edition).

Survey type	Month											
	J	F	M	A	M	J	J	A	S	O	N	D
Preliminary ecological appraisal - fieldwork												
Preliminary roost assessment - structures <sup>a</sup>												
Emergence/re-entry survey for maternity or summer roosts <sup>b</sup>												
Emergence/re-entry survey for transitional roosts <sup>b</sup>												
Emergence survey for mating roosts <sup>b</sup>												
Hibernation survey - structures <sup>a</sup>												
Preliminary ground level roost assessment - trees <sup>d</sup>												
Potential roost feature (PRF) inspection survey - trees												
Ground level bat activity survey - transects and automated/static												
Pre-, during and post-hibernation - automated/static bat activity survey												
Swarming survey												
Back-tracking survey												
Trapping survey <sup>e</sup>												
Radio tagging and tracking survey <sup>e</sup>												

= optimal period     
  = sub-optimal period  
 = weather or location dependent (i.e. may not be suitable due to spring and autumn conditions in any one year or in more northerly latitudes). Note that October surveys are not acceptable in Scotland.

<sup>a</sup> Not including trees



## Appendix 7: Glossary

**Activity surveys** - are used to assess the level of bat activity at a site. This can be done either by using equipment such as an AnaBat device, or manually walking around a site with a heterodyne detector, documenting the number of bat passes and interceptions.

**Dawn surveys** - begin around 2 hours before and up to sunrise when bats are returning to their roosts from foraging, and swarming behaviour can be seen close to roost entrances.

**Dusk surveys** - begin around 30 minutes before sunset and up to 2 hours afterwards. These are done in order to see bats emerging from their roost sites at night.

**Echolocation** – is a system similar to sonar that allows bats to travel and forage even in total darkness. Bats make a call and then listen to the returning echoes in order to build up a map of their surrounding area. This allows bats to gauge the identity and distance of an object by how long the echo takes to return to them.

**Habitat** - the ecological or environmental area that is inhabited by a particular species of animal, plant or other type of organism.

**Hibernation** - is a state of inactivity and metabolic depression characterized by lower body temperature, slower breathing, and lower metabolic rate. Hibernating animals conserve energy, especially during winter when food is short, tapping energy reserves, i.e. body fat, at a slow rate.

**Hibernacula** - typically consist of underground sites, such as caves and cellars, which remain relatively cold and humid. Bats will hibernate to conserve energy over the winter months when falling temperatures cause a drop in the abundance of insects. These will typically be colonised around November to around March.

**Insectivorous** – is when an organism feeds exclusively on insects.

**Nocturnal** - a behaviour characterized by being active during the night and sleeping during the day.

**Maternity roosts** – colonised around late May early June and consist of mature females and their young. These roosts need to be warm and quiet, and are used up until around August, with females typically leaving first and then the young.

**Mating roosts** – mating begins around late October to November. Males of most species use special mating calls to attract females. These can include purrs, clicks and buzzing.

**Roost** – a site where bats live during the day, rear young and hibernate. These can be in man made structures, such as buildings, bridges, tunnels, cellars and mines, or natural features such as mature trees and caves.

**Roosts in buildings** – many types of buildings will be used by bats. The most likely sites are agricultural buildings (e.g. farmhouses and barns), buildings with exposed wooden beams (greater than 20cm thick), buildings with weather boarding and/or hanging tiles, and buildings close to woodland and/or water.

**Roosts in trees** – these are typically in mature trees with deep sheltered cracks, under loose sections of bark, or in woodpecker holes.

**Species** – a group of organisms in which all members can interbreed and produce viable offspring.

**Summer roosts (non-breeding)** - these are generally occupied by groups of males and immature females during the summer, and are usually only occupied for a short period before the group moves to another location.

**Swarming** – a behaviour exhibited by bats returning to their roost sites at dawn. Bats can be seen repeatedly flying to and from the roost entrance, making it much easier for consultants to identify where roosts are on a building or structure.





**Temporary/Transitory roosts** – These are used after hibernation (March – April) before mature females disperse to maternity roosts and male/immature females colonise summer (non-breeding) roosts. Similarly, temporary roosts form before hibernation (August -October).

**Underground Roosts** – these are typically used during the winter and can be mines, caves, tunnels or cellars.



## Appendix 8: Protected Species Information

The following species are fully protected in UK law, under the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019:

- All UK bat species
- Dormouse
- Great Crested Newt and Natterjack Toad
- Large Blue Butterfly
- Otter
- Pine Marten
- Polecat
- Scottish Wild Cat
- Smooth Snake and Sand Lizard
- Various aquatic and plant species

These species are afforded the highest protection in the UK. Under this protection it is an offence to; deliberately capture, injure or kill any wild animal of a European protected species; deliberately disturb wild animal of any such species; deliberately take or destroy the eggs of such an animal, or damage or destroy a breeding site or resting place of such an animal.

In addition to this it is an offence to be in possession of, or to control, transport, sell or exchange, or to offer for sale or exchange, a European Protected species.

The following species are protected under UK law, such as the Wildlife and Countryside Act 1981 (as amended):

- Badger
- Nesting birds
- Red Squirrel
- Reptiles (Adder, Common lizard, Grass snake, Slow worm)
- Water Vole
- White Clawed Crayfish
- Various bird species i.e. Barn Owl
- Various plant species

Therefore under this protection it is an offence to; kill, injure or take any of the above species.

Nesting birds are only protected during the breeding season whilst on their nest. In addition to the adults being protected, the eggs, young and nest itself whilst in use are protected.

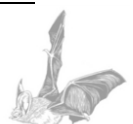
The Wildlife and Countryside Act 1981 also contains measures to prevent the establishment of non-native species which may be detrimental to native wildlife, prohibiting the release of animals and planting of plants listed in Schedule 9 in England and Wales (e.g. Japanese Knotweed and Himalayan Balsam).



Badgers are protected under The Protection of Badgers Act 1992. Under this legislation it is an offence to; take, injure, kill, or cruelly ill-treat a badger; interfere with a badger sett; sell or possess a live badger; or mark or ring a badger.

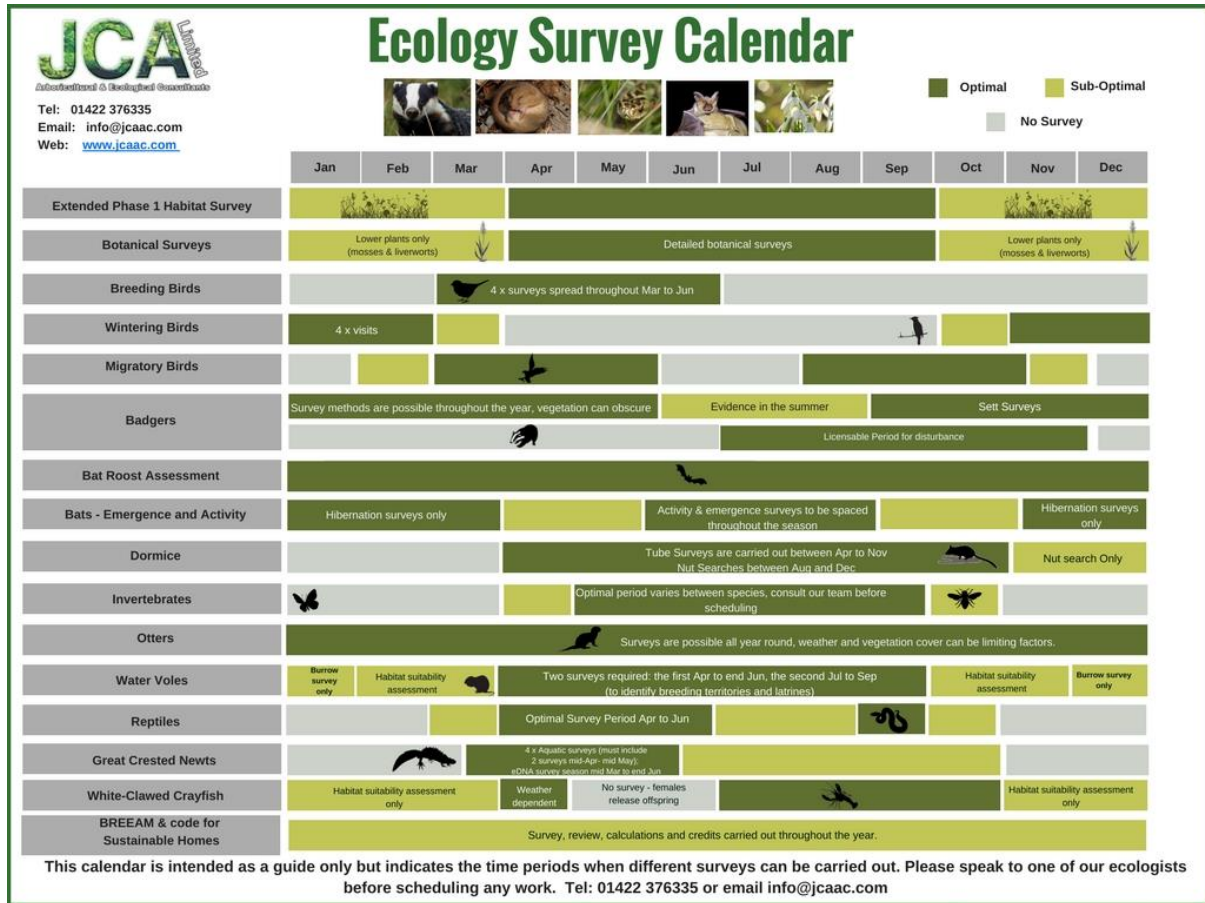
The following habitat types are protected under UK Law:

- Habitats that are used by protected species
- Habitats that fall within designated sites
- Hedgerows
- Individual trees/woods can be protected under Tree Preservation Orders



## Appendix 9: Survey Calendar

Figure 2: Survey calendar for protected species and habitat surveys.



## Appendix 10: Author Qualifications

### **Adam West, Principal Ecologist**

*BSc (Hons) Animal and Wildlife Management.*

Adam joined JCA to lead the expanding ecology department. Having returned to education as a mature student, Adam studied Countryside Management for two years before undertaking a Bachelor's degree, for which he was awarded First Class Honours. Adam has many years' experience in ecological consultancy, working on projects ranging from individual planning applications to national infrastructure projects. Adam holds a Natural England Level 1 great crested newt survey class licence, a Natural England Level 2 bat survey class licence (and the Scottish and Welsh equivalents) and a CSCS card.

### **Audrey Bourdais Paull, Graduate Ecologist**

*BSc (Hons) Zoology.*

Audrey graduated in 2020 in Zoology at the University of Leeds. Audrey volunteered for many years with various wildlife conservation and rescue organisations, as well as working on various projects to develop a variety of field survey techniques, report writing and data analysis skills. Audrey is looking forward to developing her ecology consultancy experience with JCA, as well as combining her previous dog training and detection work with ecology to expand into ecology detection dogs.

### **Helen Chambers, Seasonal Ecologist**

*MSc by Research in Environmental Studies, BSc (Hons) Wildlife Conservation with Zoo Biology.*

Helen joined JCA in 2022 after completing her master's by research degree at the University of Salford. In 2019 Helen graduated with First Class Honours BSc Wildlife Conservation with Zoo Biology, where she gained theoretical knowledge of, and practical experience with, wildlife monitoring and wildlife legislation. She is hoping to further develop her ecological surveying and report writing skills at JCA.



The information and advice which we have prepared and provided is true and has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct. We confirm that the opinions expressed are our true and bona fide opinions.

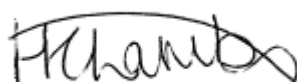
Signed



.....  
Audrey Bourdais Paull

27/07/22

Reviewed by



.....  
Helen Chambers

28/07/22

Reviewed and authorised by



.....  
Adam West *ACIEEM*

01/08/2022



For and on behalf of **JCA Ltd**

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## ECOLOGICAL SERVICES

### Ecological Pre-Planning Services

- Phase 1 Habitat Surveys
- Great Crested Newt eDNA Sampling
- Protected species: Bat, Wintering and Nesting Bird, Badger, Amphibian, Otter, Water Vole, White-Clawed Crayfish, Dormice and Reptile Surveys.
- Preparation for Environmental Impact Assessment (EIA)
- Invasive Species Surveys
- Code for Sustainable Homes
- Butterfly & Insect Surveys

### Ecological Post-Planning Services

- Biodiversity Enhancement Plans
- Protected Species Mitigation
- Ecological Management (Bat and Bird box installation and inspection)
- Planting Schemes
- Monitoring of bird or bat boxes.

## ARBORICULTURAL SERVICES

### Guidance for Architects & Developers

- British Standard 5837 Surveys
- Arboricultural Implications Assessments (AIA)
- Arboricultural Method Statements (AMS)

### Advice for Engineers, Loss Adjusters and Insurers

- Tree Surveys for Subsidence
- Heave Assessment
- Tree Root Identification

### Advice for Local Authorities and Social Housing

- Tree Safety Surveys
- Specialist Decay Detection
- Landscape and Orchard Design

### Tree Advice for the Legal Profession

- Subsidence Litigation
- Personal Injury and Accident Investigation
- Expert Witness, Planning Inquiries and Appeals

### Veteran Tree Management

- Ancient Woodland Management
- Veteran Tree Management

### Tree Health and Pest and Disease Management

- Pest and Disease Surveys
- Tree Health Checks
- Disease Mitigation and Control



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