



# Wild Service

## The Barn, Gotherington

### Preliminary Ecological Appraisal & Bat Survey Report



Project Ref. EP2020036Av2

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**Wild Service Office**

Conservation Centre

Robinswood Hill Country Park

Reservoir Road

Gloucester

GL4 6SX

**Tel** 01452 383 333

**Email** [info@wildservice.net](mailto:info@wildservice.net)

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	<b>Name</b>	<b>Date</b>
Prepared by	Julia Morrison, Assistant Ecologist & Elizabeth Pimley, Principal Ecologist	21/10/2020
Checked by	Elizabeth Pimley, Principal Ecologist	15/10/2020

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# 1 Introduction

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## 1.1 Scope

- 1.1.1 Wild Service was commissioned by [REDACTED] to undertake a Preliminary Ecological Appraisal including a Preliminary Roost Assessment of a barn located at The Barn, Manor Lane, Gotherington, GL52 9QX (hereafter referred to as the 'Site'). The requested surveys were required to inform a potential planning application for conversion of northern part of the barn for a dedicated home office and storage room. The southern end of the barn will have a low ceiling fitted to close off the roof void from the lower part of the barn, which will be used for storage. The concrete floor of the outbuilding will need to be levelled and a low wall constructed.
- 1.1.2 The Preliminary Ecological Appraisal (PEA) comprised a Phase 1 Habitat Survey and protected species survey, included a Preliminary Roost Assessment (PRA), which comprised an internal and external building inspection for bats.
- 1.1.3 These initial ecological appraisal survey and roost assessment led to further protected species surveys comprising; two dusk emergence bat surveys and one dawn re-entry bat survey.
- 1.1.4 This report includes a description of methods used to identify habitats, results and recommendations for mitigation.

## 1.2 Site Description

- 1.2.1 The Site is located on the outskirts of Gotherington village in Gloucestershire, approximately 750m west of the centre of the village. The Site comprises an L-shaped barn building which is situated to the east of a residential home. The barn is bounded by a road to the north, by which the main residential home is accessed. To the east and west are small access tracks, and to the south is an area of hardstanding used as a car park for the residential home. To the southern gable end of the barn, another barn building is partially adjoined. There are three small garden ponds (referred to as 'Pond 1', 'Pond 2' and 'Pond 3') to the south-east of the barn but still

within the garden of [REDACTED] the closest of which is located approximately 20m from the barn. A Site overview is provided in Figure 1.

1.2.2 The wider landscape consists of a few houses and large gardens as well as arable land bordered by hedgerows and a small number of scattered buildings. There is a railway line approximately 100m to the west of the Site and a large woodland is located approx. 450m to the south-east of the Site.

1.2.3 The central grid reference of the Site is SO 97180 29366.

### **1.3 Legislation**

1.3.1 This report has been prepared in accordance with relevant legislation and policy. Further detail is provided in Appendix 1, however the following primary documents are of relevance:

- The Wildlife and Countryside Act 1981 (as amended) (WCA 1981);
- The Countryside and Rights of Way Act (CROW Act), 2000 (as amended);
- The Natural Environment and Rural Communities Act (NERC Act), 2006;
- The Protection of Badgers Act 1992 (PBA 1992); and
- The Conservation of Habitats and Species Regulations 2017 (as amended) (CHS 2017).

1.3.2 No part of this report should be considered as legal advice and when dealing with individual cases, the client is advised to consult the full texts of the relevant legislation and obtain further legal advice.



## **2 Survey Methods**

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### **2.1 Desk Study**

2.1.1. The objectives of the desk study are to review the existing available information in order to identify the following:

- Statutory and non-statutory nature conservation sites within 1km; and
- Records of protected and notable species within 1km.

2.1.1. Ecological data were provided by the Gloucestershire Centre for Environmental Records (GCER).

### **2.2 Phase 1 Habitat & Protected Species Survey**

2.2.1. The methods used for the Phase 1 habitat and protected species survey are outlined in Table 1.

2.2.2. Elizabeth Pimley of Wild Service completed the appraisal on the 27<sup>th</sup> August 2020.

### **2.3 Preliminary Roost Assessment**

2.3.1 The barn was evaluated for its bat roosting potential both internally and externally by Elizabeth Pimley, a Natural England Class Level 2 bat licence holder (2015-13418-CLS-CLS, WML CL18) and Julia Morrison, an Accredited Agent on Elizabeth's bat licence. The survey was undertaken in accordance with best practice guidelines (based on Collins, 2016).

2.3.2 The barn's exterior was observed from ground level using binoculars and a high-powered torch, paying attention to potential roosting and access points for bats. Internal areas were also accessed where possible. Areas of particular suitability include crevices in stonework, gaps beneath roof tiles and any dark loft spaces. Any suitable areas were searched thoroughly for evidence of use by bats. Signs of bats include live animals, corpses, droppings, urine staining, feeding remains (e.g. moth and butterfly wings) and scratches.

### **2.4 Dusk Emergence and Dawn Re-entry**

- 2.4.1 Surveyors were positioned around the barn so that potential roosting features could be viewed. Each surveyor was equipped with a radio during the bat activity surveys to facilitate communication between surveyors as to bat emergence/re-entry behaviour and for health and safety reasons. The dusk surveys began 15 minutes prior to sunset and ended between 90 and 120 minutes after sunset, and the dawn surveys began 120 minutes prior to sunrise and ended at sunrise (unless bat activity continued in which case the survey was extended).
- 2.4.2 Bat detectors were used to record bat echolocation calls in order to identify the species present on site. Echometer Touch 2 Pro detectors and Pettersson detectors (M500-384 USB Pettersson detectors), all set to time expansion mode, were used to carry out the survey.
- 2.4.3 Where possible the bat surveyors used a red light to inspect the interior of barn for any bats at intervals during the survey to gain a more detailed understanding of where bats are roosting/feeding.
- 2.4.4 Each surveyor was trained and had prior experience in carrying out dusk emergence/dawn re-entry surveys and the use of bat detectors.

## **2.5 Habitat Suitability Index (HSI) Assessment**

- 2.5.1 The three ponds to the south-east of the barn were assessed by Elizabeth Pimley (Natural England GCN licence 2015-18165-CLS-CLS (Level 1) using the Habitat Suitability Index (HSI) Assessment. The HSI Assessment is a standard appraisal method developed specifically to evaluate the habitat suitability for great crested newts (Oldham *et al.*, 2000). This method assesses a series of ecological factors along suitability guidelines and allocates a value between 0.1 (highly unsuitable) to 1.0 (highly suitable) to each factor. The geometric mean of these values provides an overall suitability value for the site.

## **2.6 Limitations and Constraints**

- 2.6.1 While every attempt has been made to collect accurate baseline data, all ecological surveys represent a 'snapshot' of activity. Ecological features are dynamic and often

transient and it is not possible to confirm the absence of a species through survey. It may be necessary to update ecological surveys if sufficient time elapses since the surveys and data presented in this report should not be used for long-term analysis of species behaviour.

Table 1. Phase 1 Habitat &amp; Protected Species Survey Methods

<b>Phase 1 habitat survey</b>	The aim of the Phase 1 survey is to provide a description of the semi-natural vegetation of a particular site and is made in accordance with the JNCC Phase 1 Habitat Survey methodology (JNCC, 2010). Where necessary, the condition of habitat is described, and full plant lists collated to provide greater detail, which helps when identifying the conservation significance of a particular habitat. The appraisal also aims to identify invasive plants listed on Schedule 9 of the Wildlife & Countryside Act that could have implications for works on site. Where appropriate, maps are provided in other formats, such as annotated aerial photographs.
<b>Badgers</b>	The site is assessed for suitable habitats that may support badgers <i>Meles meles</i> . Where relevant habitat occurs, evidence of badgers including setts, latrines, tracks, snuffle holes, padding or guard hairs is recorded.
<b>Bats</b>	The Site is assessed for suitable habitats, generally buildings and trees, that may support roosting bats. For example, buildings are assessed for holes in soffits, missing tiles and gaps in the masonry whilst trees are assessed for features such as cracks, holes, flaky bark and established ivy cover. Where possible the interior of buildings are also inspected for suitable roosting features and any evidence of bats in the form of bats, droppings, urine staining and feeding remains are noted. Potential roosting features are classed as negligible, low, moderate, or high potential in (Collins, 2016). The suitability of the habitats for foraging bats is also assessed.
<b>Birds</b>	The site is assessed for suitable habitats that may support birds in terms of feeding, nesting and roosting. Where relevant habitat occurs, evidence identifying the presence of birds including nests, droppings, pellets and feathers is recorded.
<b>Dormice</b>	The site is assessed for suitable habitats that may support dormice <i>Muscordinus avelonarius</i> including woodland and hedgerows. Where relevant habitat occurs evidence of dormice including nests and gnawed nuts is recorded.
<b>Great crested newts</b>	During the site visit the potential of the site to support great-crested newts <i>Triturus cristatus</i> is assessed; this includes looking for potential breeding sites such as ponds, disused swimming pools and other water-bodies. The appraisal also focuses on the potential for this species to find refuge in places such as log piles, rubble and compost heaps. Where still water-bodies occur a Habitat Suitability Index (HSI) is calculated. This is a standard appraisal method developed specifically to evaluate the habitat suitability for great crested newts (Oldham <i>et al.</i> 2000). A series of factors must be considered. Each factor is assessed along suitability guidelines and allocated a value of between 0.1 (highly unsuitable) to 1.0 (highly suitable). The geometric mean of these values provides an overall suitability value for the site. Although this is no substitute for a dedicated survey the suitability value informs the decision on whether to undertake a dedicated survey.
<b>Otters</b>	The area under appraisal is searched for suitable habitat along water-bodies, recording where appropriate, evidence pertaining to the presence of otters <i>Lutra lutra</i> in the form of holts, spraints, anal jelly, tracks and feeding remains.
<b>Reptiles</b>	The site is assessed for suitable habitats that may support reptiles including slow-worms <i>Anguis fragilis</i> , common lizards <i>Zootoca vivipara</i> grass snakes <i>Notrix notrix</i> and adder <i>Vipera berus</i> . Where relevant habitat occurs, evidence identifying the presence of reptiles, particularly tracks and sloughed skin is recorded.
<b>Water voles</b>	The area under appraisal is searched for suitable habitat along water-bodies, recording where appropriate, evidence pertaining to the presence of water voles <i>Arvicola amphibius</i> in the form of burrows, latrines, runs, footprints and distinctive "feeding lawns".
<b>White-clawed crayfish</b>	The area under appraisal is searched for suitable habitats that may support white-clawed crayfish <i>Austropotamobius pallipes</i> . This typically includes freshwater streams and rivers but may also include still water-bodies.

## **3 Results, Appraisal and Recommendations**

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### **3.1 Desk Study**

- 3.1.1 There are no statutory nature conservation sites within 1km of the Site.
- 3.1.2 There are two non-statutory nature conservation sites within 1km of the Site, both of which are designated as Local Wildlife Sites (LWS). Bushcombe Wood LWS is approx. 900m to the south-east of the Site and Gotherington Wood LWS is approx. 450m to the south-east; both are designated due to 'ancient semi-natural broadleaved woodland' habitat. These nature conservation sites are sufficiently distance from the development Site for there to be no effect on the ecological value of these sites.
- 3.1.3 The biological data search yielded records of several protected and notable species within 1km of the Site; none of the records are specific to the Site. Protected species record results are provided in Table 2.

### **3.2 Phase 1 Habitat & Protected Species Survey**

- 3.2.1 The results of the Phase 1 Habitat & Protected Species Survey assessment are outlined in the Table 2 and Table 3 below. Reference should be made to the Phase 1 map presented in Figure 1, and photos in Appendix 2.

### **3.3 Preliminary Roost Assessment**

- 3.3.1 Results of the Preliminary Roost Assessment are provided in the 'Bats' section of Table 2. Reference should be made to Figure 1 and photos in Appendix 2.

### **3.4 Dusk Emergence and Dawn Re-entry**

- 3.4.1 Survey weather data is recorded in Table 4. The results of the dusk emergence and dawn re-entry surveys are outlined in Table 5.1., 5.2., & 5.3., and surveyor positions and bat emergence/re-entry points are labelled on Figure 2.

### **3.5 Habitat Suitability Index (HSI) Assessment**

- 3.5.1 Although the ponds in the garden were outside the Site boundary, they were assessed for their suitability for GCN to enable the impact of the barn

conversion to be fully assessed. The results of the HSI assessment are summarised in the great crested newt section of Table 2 and full results are provided in Appendix 3. The approximate size of the three surveyed garden ponds are Pond 1 (3m x 1.5m), Pond 2 (3m x 1m) & Pond 3 (1m x 0.5m). The ponds outside the garden are: Pond 4 (18m x 38m) and Pond 5 (30m x 15m). Only Pond 4 could be viewed at the time of the survey.

Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
<b>BADGERS</b>	The barn does not provide suitable habitat for badgers. The surrounding large garden habitat provides suboptimal commuting/foraging habitat.	None.	There are no records of badgers within 1km of the Site.	Unlikely to be present.	None.	Badgers are offered full protection under the PBA 1992. <b>No further surveys required.</b>
<b>BATS</b>	<p>The barn provides suitable roost features for bats and prior to undertaking the surveys, the clients confirmed presence of roosting bats in the barn.</p> <p>The barn is L-shaped and has an open-fronted area to the west (referred to as 'remodelled' section). The corner of the L-shaped barn (to the east) and the southern gable end of the barn are</p>	On internal inspection three lesser horseshoe <i>Rhinolophus hipposideros</i> bats were seen hanging to the ceiling in the southern tip of the barn, and a large number of droppings were located on the barn floor in the same area. Droppings were also seen in the corner of the barn though a smaller amount than in the	There are 21 records of bats within 1km of the Site, but none are specific to the Site. The records all relate to one site approx. 950 away where seven species were recorded comprising; brown long-eared bat <i>Plecotus auritus</i> , a lesser horseshoe roost, noctule	<b>Present,</b> roosting in barn.	High impact for any roosting bats without mitigation. Low/moderate impact to foraging bats unless lighting recommendations are followed.	<p>Bats and their resting places are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017.</p> <p>Prior to the PEA survey the client confirmed roosting bats were present in the barn and therefore two dusk emergence and one dawn re-entry surveys were undertaken, the first directly after the initial preliminary roost assessment of the barn.</p>

Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
	<p>enclosed and can be accessed by a large rolling garage door, or a small wooden door, each of which has gaps to the top and bottom of the doors which are large enough for most species of bats to enter/exit the building. The building is a single-storey structure with a pitched roof. The walls are built from dry stones and the roof is tiled.</p> <p>On external inspection the dry-stone walls have deep cracks and crevices which are potential roost features for bats. Some of the roof tiles are also loose which provide ingress points for roosting bats. The barn adjoins another barn</p>	southern gable end under the roosting bats.	<p><i>Nyctalus noctula</i>, a common pipistrelle <i>Pipistrellus pipistrellus</i> roost, serotine <i>Eptesicus serotinus</i>, soprano pipistrelle <i>Pipistrellus pygmaeus</i>, and a <i>Myotis</i> species roost.</p>			<p>During the dusk emergence and dawn re-entry surveys, a maximum of eight lesser horseshoe bats were observed roosting in the southern part of the barn, while a maximum of three lesser horseshoe bats were observed also using the southern part of the barn as night roost. The results confirm the barn is used as a summer non-maternity day roost and a night roost for lesser horseshoe bats.</p> <p>A maximum of two common pipistrelle emergences were recorded during the first dusk emergence survey. The results confirm the barn is used as a summer non-maternity day roost for a small number of common pipistrelle bats.</p> <p>One Brandt's bat <i>Myotis brandti</i> was recorded re-entering the</p>



Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
	<p>building at the southern gable end. Where the two buildings meet there are significant gaps between the walls which allow entry/exit points for bats.</p> <p>Internally, the open-fronted remodelled section of the barn to the west is relatively exposed to the elements but is generally dark at night. The enclosed section of the barn has several roost features for bats including the wooden roof beams, and the cracks/crevices within the stone walls.</p>					<p>barn, confirming the barn is an occasional summer non-maternity day roost for one Brandt's bat.</p> <p>As there are roosting bats in the barn an EPS mitigation licence application to Natural England will be required. The entire roof void of the southern enclosed part of the barn will be retained for the use of bats, while the other part will be converted into a storage area. Further mitigation and recommendations are provided in the Discussion.</p> <p>Lighting recommendations to minimise impact on foraging bats are provided in the discussion below.</p>

Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
<b>BIRDS</b>	The barn provides suitable habitat for nesting birds, especially swallows <i>Hirundo rustica</i> .	Three swallow's nests were found in the open-fronted remodelled section of the barn.	Biological records yielded results of 19 species within 1km of the Site and include barn owl <i>Tyto alba</i> , lesser spotted woodpecker <i>Dendrocopos minor</i> , swift <i>Apus apus</i> , house sparrow <i>Passer domesticus</i> and spotted flycatcher <i>Muscicapa striata</i> . The following species of bird were observed in/around the ponds near the Site: coots <i>Fulica Atra</i> , moorhen <i>Gallinula chloropus</i> , and mallard <i>Anas platyrhynchos</i> .	Present, swallow's nests recorded in more open part of barn.	High unless barn conversion works are undertaken outside bird nesting season.	All birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended). It is therefore generally unlawful to intentionally kill or injure a bird, damage or destroy an occupied nest or take or destroy eggs other than in exceptional prescribed circumstances. Therefore, development operations should take care to avoid the risk of harm to birds and their nests, especially during the nesting season (generally considered to be March to August). Conversion of the barn should take place outside the main nesting season and where this is not possible a suitably qualified ecologist should be engaged to check for nesting birds and to provide advice on the most appropriate way to proceed.

Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
						In order to provide alternative nesting habitat for swallows, an overhang should be created under the eaves and two swallow cups should be fitted (see Appendix 3).

Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
<b>DORMICE</b>	The barn does not provide suitable habitat for dormice.	None.	There are no records of dormice within 1km of the Site.	None.	None.	Dormice and their resting places are protected under the WCA 1981 and the CHS Regs 2017. <b>No further surveys required.</b>
<b>GREAT CRESTED NEWTS (GCN)</b>	The barn has an uneven concrete floor and does not provide suitable foraging habitat for great crested newt (GCN), although the possibility of GCN sheltering in/near the barn cannot entirely be ruled out. There are three ponds (Pond 1, Pond 2 & Pond 3) in close proximity to the barn (approx. 20m, within the garden comprising well mown amenity grass), each of which was subject to a Habitat Suitability Index (HSI) assessment. Ponds 1, 2 and 3 were each assessed as 'poor' and each had an	None.	There are two GCN records approx. 1km from the Site and a GCN record at Gretton Road (approx. 400m away), which is separated from the Site by the nearby railway line.	It is considered relatively unlikely that GCN will be present in the barn as it is built on a concrete base that does not provide suitable foraging habitat for GCN and there is more suitable habitat within the immediate vicinity of the large ponds for foraging and	The ponds and garden will not be affected by the barn conversion, and the barn itself does not provide suitable foraging habitat for GCN. However, the possibility of GCN sheltering in/near the barn cannot entirely be ruled out, and as such it will be necessary for works to proceed under the following recommendations including timing of works.	GCN and their resting/breeding places are protected under the WCA 1981 and CHS Regs 2017. It is our understanding that conversion of the barn into a storage facility will involve levelling of the floor and building a low wall. These works will need to occur during March to April (to be covered under the bat licence) when the majority of newts should be in the ponds and the bats would be roosting in hibernation sites elsewhere. Immediately prior to works, a GCN licensed ecologist will check for any amphibians as a precautionary measure and will then supervise the floor releveling and wall construction works.

Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
	<p>HSI value of 0.43. This value indicates that these ponds are unlikely to support GCN. Full HSI survey results are provided in Appendix 3. A large pond (18x38m) partially visible from the garden (20m from barn) contains fish and various species of waterfowl use it (as listed in the Birds section above), making it less suitable for GCN. An HSI of this pond assessed it as 'below average' with an HSI value of 0.60. This value indicates that this pond could support GCN. A second large pond (30x15m) is situated 56m from the barn, although not visible from the Site. It was not possible to inspect this pond due to the owners being abroad</p>			sheltering newts..		<p>All building materials will be stored on pallets to raise them from the ground. Any trenches built during construction shall be backfilled before nightfall, or otherwise equipped with a means of escape or covered to avoid animals becoming trapped.</p> <p>Construction of a log pile/hibernaculum (as shown in the Ecological Enhancements Section) in the garden prior to any works will provide useful shelter for any local amphibians and act as a receptor in the unlikely event that any are found in the barn.</p>

Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
	<p>and then needing to quarantine on their return in line with government Covid-19 guidelines. However, this second pond has been dredged this year and therefore is unlikely to support any amphibians. (The pond is dredged every 20 years). The large ponds are separated from the Site by mown amenity grassland and gravel tracks. As these ponds were outside the ownership of the client, they could not be assessed at the time of the PEA.</p>					

Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
<b>OTTERS, WATER VOLES &amp; WHITE-CLAWED CRAYFISH</b>	There is no suitable habitat for these species on Site, nor in the surrounding landscape.	None.	There are no records of these species within 1km of the Site.	None.	No impact.	Water voles and WC crayfish are protected under the WCA 1981, and otters and their resting places are also protected under the CHS Regs 2017. <b>No surveys required.</b>
<b>REPTILES</b>	The barn does not provide suitable habitat for reptiles, and the surrounding well maintained garden habitat does not provide suitable conditions for reptiles.	None.	There is one record of a slow-worm within 1km of the Site, located more than 600m from the Site.	Unlikely	No impact.	Reptiles are protected under the Wildlife & Countryside Act 1981 (as amended). <b>No further surveys required.</b>
<b>HEDGEHOGS</b>	The barn does not provide suitable habitat for hedgehogs, but they may be present in the surrounding habitat as the garden provides suitable habitat.	None.	There are two records of hedgehogs within 1km of the Site.	Unlikely to be present in barn but possibly present in surrounding habitat.	No impact.	Hedgehogs are listed as a Priority Species under the NERC Act 2006. Due to the possibility for hedgehogs to use the garden surrounding the barn for commuting/foraging, any trenches built during



Table 2. Protected Species Survey Table

Species	Habitats/features	Evidence	Data search	Likelihood of presence	Potential impact	Recommendations Further survey required? (Yes/No) / Avoidance / mitigation / enhancement measures
						<p>construction shall be backfilled before nightfall, or otherwise equipped with a means of escape or covered to avoid animals becoming trapped. Any fencing can be made more permeable to wildlife, such as hedgehogs, through leaving small gaps of 13x13cm under fences.</p> <p>Hedgehog shelters in the form of log piles/hedgehog home can be installed in the garden to create more areas of shelter for this endangered species. See Ecological Enhancements section below.</p>



Table 3. Phase 1 Habitat Survey Results

Habitat/Feature	Description	Local NERC <sup>1</sup> habitat Y/N	Evaluation and potential impact	Recommendations Avoidance / mitigation / enhancement measures
<b>BUILDING (L-SHAPED BARN)</b>	The Site comprises the L-shaped barn. A full description of the barn is provided in the bats section of Table 2.	N	High impact to roosting bats.	See bats section of Table 2.

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<sup>1</sup> Habitats of 'Principal Importance' under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006

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Table 4. Bat Survey Conditions

Survey Date	Sunset/sunrise Time	Start/End of Survey	Temperature °C	Wind (beaufort scale)	Rain
27/08/2020 Dusk Survey	20:06	Start 19:51	15.1	0	None
		End 21:36	12.0	0	None
10/09/2020 Dusk Survey	19:34	Start 19:19	14.8	0	None
		End 21:06	13.8	0	None
18/09/2020 Dawn Survey	06:48	Start 05:18	9.3	1	None
		End 07:00	9.3	2	None

Table 5.1. Dusk Emergence Survey – 27<sup>th</sup> August 2020. Sunset: 20:06

Activity		Details			
Time	Details	Species	No. of bats	Surveyor No.	Location/Behaviour
19:20	Roosting	<i>R. hipposideros</i>	3	1	Three bats seen roosting inside the barn toward the southern gable end of the building and a large number of droppings seen underneath the roosting bats.
20:00	Pass	<i>N. noctula</i>	1	1	Call heard, bat not seen.
20:18	Light sampling	<i>R. hipposideros</i>	1	1	Bat seen light sampling but flew back into barn.
20:20	Emergence	<i>R. hipposideros</i>	1	1	Bat emerged from under eaves through the gap between the small door entrance to the southern gable end of the barn. No echolocation call detected but flight pattern/size of bat indicative of lesser horseshoe.
20:22	Pass	<i>N. noctula</i>	1	1	Call heard, bat not seen.
20:22	Commuting	<i>P. pipistrellus</i>	1	1	Bat seen flying over building.
20:23	Pass	<i>P. pipistrellus</i>	1	2	Call heard, bat not seen.
20:23	Pass	<i>P. pipistrellus</i>	1	1	Bat flew over roof of barn.

20:24	Commuting	<i>P. pipistrellus</i>	1	2	Bat seen flying over building from south to north.
20:27	Emergence	<i>P. pipistrellus</i>	1	2	<b>Bat flew out from under roof on the northern elevation, near the corner of the building, and flew east.</b>
20:28	Pass	<i>N. noctula</i>	1	1	Call heard, bat not seen.
20:28	Pass	<i>Myotis mystacinus</i>	1	1	Call heard, bat not seen.
20:28	Pass	<i>N. noctula</i>	1	2	Call heard, bat not seen.
20:29	Emergence	<i>P. pipistrellus</i>	1	1	<b>Bat emerged from roof of retained part of barn.</b>
20:30	Pass	<i>P. pipistrellus</i>	1	1	Call heard, bat not seen.
20:34	Pass	<i>N. noctula</i>	1	1	Call heard, bat not seen.
20:39	Emergence (adjoining barn)	<i>P. pipistrellus</i>	1	1	<b>Bat seen emerging from the western gable end of the tall barn adjoining the surveyed barn.</b>
20:41	Commuting	<i>P. pipistrellus</i>	1	1	Bat seen flying over building.
20:42	Pass	<i>Myotis daubentonii</i>	1	1	Call heard, bat not seen.
20:47	Commuting	<i>P. pipistrellus</i>	2	2	Two bats flew from west to east along access road, past the barn.
20:49	Commuting	<i>P. pipistrellus</i>	1	2	One bat flew from east to west along access road, past the barn.
20:49	Pass	<i>P. pipistrellus</i> & <i>N. noctula</i>	1 of each	1	Calls heard, bats not seen.
20:50	Pass	<i>P. auritus</i> & <i>N. noctula</i>	1 of each	2	Calls heard, bats not seen.
20:52	Pass	<i>P. pipistrellus</i> & <i>N. noctula</i>	1 of each	2	Calls heard, bats not seen.
20:52	Pass	<i>M. mystacinus</i> & <i>P. pipistrellus</i>	1 of each	1	Calls heard, bats not seen.
20:53	Commuting	<i>P. pipistrellus</i>	1	2	One bat flew from east to west along access road, past the barn.
20:54	Pass	<i>E. serotinus</i>	1	2	Call heard, bat not seen.
20:55	Pass	<i>Myotis</i> sp.	1	1	Call heard, bat not seen.
20:55	Pass	<i>P. pipistrellus</i> & <i>N. noctula</i>	1 of each	1	Calls heard, bats not seen.
20:56	Pass	<i>P. pipistrellus</i> & <i>Myotis</i> sp. & <i>N. noctula</i>	1 of each	2	Calls heard, bats not seen.

20:57	Pass	<i>P. pipistrellus</i> & <i>N. noctula</i>	1 of each	2	Calls heard, bats not seen.
20:58	Commuting	<i>P. pipistrellus</i>	1	2	One bat flew from east to west along access road, past the barn.
21:01	Pass	<i>P. pipistrellus</i> & <i>N. noctula</i>	1 of each	2	Calls heard, bats not seen.
21:02	Pass	<i>Myotis</i> sp.	1	2	Call heard, bat not seen.
21:03	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	2	Calls heard, bats not seen.
21:03	Internal inspection	-	0	1	No bats seen inside barn during internal inspection.
21:04	Pass	<i>P. pipistrellus</i> & <i>Myotis</i> sp.	1 of each	2	Calls heard, bats not seen.
21:05-21:12	Passes	<i>P. pipistrellus</i>	1	1	Occasional passes recorded.
21:06	Pass	<i>P. pipistrellus</i> & <i>N. noctula</i>	1 of each	2	Calls heard, bats not seen.
21:07	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	2	Calls heard, bats not seen.
21:09-21:11	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	2	Calls heard, bats not seen.
21:12	Pass	<i>P. pipistrellus</i>	1	2	Call heard, bat not seen.
21:13-21:14	Pass	<i>N. noctula</i>	1	2	Call heard, bat not seen.
21:14	Pass	<i>P. auritus</i>	1	2	Call heard, bat not seen.
21:15	Roosting	<i>R. hipposideros</i>	1	1	<b>One lesser horseshoe seen flying around in the retained part of the barn building. Night roosting.</b>
21:15	Pass	<i>P. pipistrellus</i>	1	2	Call heard, bat not seen.
21:16	Pass	<i>Nyctalus leisleri</i>	1	2	Call heard, bat not seen.
21:17	Pass	<i>N. noctula</i> & <i>P. pygmaeus</i>	1 of each	2	Calls heard, bats not seen.
21:17	Roosting	<i>R. hipposideros</i>	1	1	<b>One lesser horseshoe seen flying around inside the barn. Night roosting.</b>
21:18	Pass	<i>N. noctula</i>	1	2	Call heard, bat not seen.
21:19	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	2	Calls heard, bats not seen.
21:21	Pass	<i>P. pipistrellus</i>	1	1	Call heard, bat not seen.
21:22	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	1	Calls heard, bats not seen.

21:22	Pass	<i>P. auritus</i> & <i>N. noctula</i>	1 of each	2	Calls heard, bats not seen.
21:23-21:27	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	2	Calls heard, bats not seen.
21:28	Pass	<i>E. serotinus</i>	1	2	Call heard, bat not seen.
21:30-21:34	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	2	Calls heard, bats not seen.
21:36	Survey terminated as it was too dark to see any further emergence activity.				
<b>Notes</b>	Internal temperature at the start of the survey was 16.5°C and at the end of the survey the internal temperature was 15.3°C. Three swallow's nests were recorded in the eaves of the remodelled part of the barn. A security light near the large opening to the enclosed part of the barn i.e. near the garage door, potentially deters lesser horseshoe bats from emerging from this part of the barn. A barn owl <i>Tyto alba</i> was heard during the survey.				

A total of three lesser horseshoe bats were seen roosting in the barn (toward the southern gable end) during internal inspection at the start of the survey. One lesser horseshoe emerged from under eaves through the gap between the small door entrance to the southern gable end of the barn. The other two lesser horseshoe bats remained in the barn and appeared to be using it as a night roost as well as a day roost. Two common pipistrelle bats emerged from the roof of the barn (one from the corner area, and one from the retained part of the barn).

Table 5.2. Dusk Emergence Survey – 10<sup>th</sup> September 2020. Sunset: 19:34

Activity		Details			
Time	Details	Species	No. of bats	Surveyor No.	Location/Behaviour
19:29	Roosting	<i>R. hipposideros</i>	3	1	Three bats seen roosting inside the barn toward the southern gable end of the building and a large number of droppings seen underneath the roosting bats.
19:32-19:39	Passes	<i>N. noctula</i>	1	2	Call heard, bat not seen.
19:37	Pass	<i>N. leisleri</i>	1	2	Call heard, bat not seen.
19:38	Pass	<i>N. noctula</i>	1	1	Call heard, bat not seen.
19:39	Pass	<i>N. noctula</i>	1	3	Call heard, bat not seen.
19:44	Emergence (main house)	<i>P. pipistrellus</i>	1	3	Bat flew out from under roof of the north-east corner of the main house, then flew west.
19:47	Emergence (adjoining barn)	<i>P. pipistrellus</i>	1	3	Bat flew out of roof from western gable end of adjoining barn, then flew west.
19:47	Pass	<i>P. pipistrellus</i>	1	2	Call heard, bat not seen.
19:47	Emergence (adjoining barn)	<i>P. pipistrellus</i>	1	1	Bat emerged from eaves by gable end of adjoining building.
19:50-19:53	Passes	<i>N. noctula</i>	1	2	Call heard, bat not seen.
19:51-19:54	Passes	<i>P. pipistrellus</i>	1	1	Call heard, bat not seen.
19:52	Pass	<i>P. pipistrellus</i> & <i>P. pygmaeus</i>	1 of each	3	Calls heard, bats not seen.
19:53	Pass	<i>P. pipistrellus</i> & <i>N. noctula</i>	1 of each	3	Calls heard, bats not seen.
19:54-19:56	Foraging	<i>P. pipistrellus</i>	1	3	Bat seen flying near garden to south of barn & feeding sounds heard.
19:55	Emergence	<i>P. pipistrellus</i>	1	1	Bat emerged from gap around small barn door on western elevation.
19:56	Passes	<i>N. noctula</i>	1	3	Call heard, bat not seen.
19:58	Commuting	<i>N. noctula</i>	1	3	Bat seen flying from west to east high over access road.

19:58	Commuting	<i>N. noctula</i>	1	1	Bat seen flying overhead.
19:59-20:02	Passes	<i>P. pipistrellus</i>	1	2	Call heard, bat not seen.
20:00	<b>Emergence (adjoining barn)</b>	<i>P. pipistrellus</i>	2	2	<b>Bats emerged from north-east corner of tall adjoining barn.</b>
20:01-20:06	Passes	<i>N. noctula</i>	1	2	Call heard, bat not seen.
20:02	Pass	<i>Myotis</i> sp.	1	3	Call heard, bat not seen.
20:03	Commuting	<i>N. noctula</i>	1	3	Bat seen flying from east to west high over access road.
20:07	Pass	<i>N. noctula</i>	1	3	Call heard, bat not seen.
20:07	Pass	<i>N. noctula</i>	1	1	Call heard, bat not seen.
20:08	Pass	<i>P. pipistrellus</i>	1	1	Call heard, bat not seen.
20:08-20:10	Foraging	<i>P. pipistrellus</i>	1	3	Bat flew from road to the north, then foraging over surveyor for a few minutes.
20:09	Pass	<i>P. pipistrellus</i>	1	1	Call heard, bat not seen.
20:11	Pass	<i>P. auritus</i>	1	1	Call heard, bat not seen.
20:12	Pass	<i>P. auritus</i>	1	1	Call heard, bat not seen.
20:15	<b>Emergence</b>	<i>R. hipposideros</i>	2	3	<b>Two lesser horseshoe bats flew out from above garage door, then west.</b>
20:17	Pass	<i>P. pipistrellus</i>	1	3	Call heard, bat not seen.
20:18	Pass	<i>M. daubentonii</i>	1	3	Call heard, bat not seen.
20:18	Roosting	<i>R. hipposideros</i>	1	1	One bat seen inside barn.
20:19	Pass	<i>N. noctula</i>	1	3	Call heard, bat not seen.
20:21	Pass	<i>Myotis</i> sp.	1	3	Call heard, bat not seen.
20:21	Pass	<i>P. pygmaeus</i>	1	2	Call heard, bat not seen.
20:21	Pass	<i>M. daubentonii</i>	1	1	Call heard, bat not seen.
20:23	Pass	<i>P. auritus</i>	1	3	Call heard, bat not seen.

20:24	Pass	<i>M. daubentonii</i>	1	3	Call heard, bat not seen.
20:24	Pass	<i>M. daubentonii</i>	1	2	Call heard, bat not seen.
20:24	Pass	<i>P. auritus</i>	1	1	Call heard, bat not seen.
20:24	Pass	<i>M. nattereri</i>	1	1	Call heard, bat not seen.
20:25	Pass	<i>P. auritus</i> & <i>N. noctula</i>	1 of each	3	Calls heard, bats not seen.
20:25	Pass	<i>P. auritus</i>	1	1	Call heard, bat not seen.
20:25	Pass	<i>N. noctula</i>	1	1	Call heard, bat not seen.
20:25- End of survey	Passes	<i>P. pipistrellus</i>	1	2	Call heard, bat not seen.
20:26	Pass	<i>M. daubentonii</i>	1	2	Call heard, bat not seen.
20:26	Pass	<i>P. pipistrellus</i>	1	1	Call heard, bat not seen.
20:26	Pass	<i>P. pipistrellus</i>	1	3	Call heard, bat not seen.
20:26- 20:41	Passes	<i>N. noctula</i>	1	2	Call heard, bat not seen.
20:27	Pass	<i>P. pipistrellus</i>	1	1	Call heard, bat not seen.
20:28	Pass	<i>Myotis nattereri</i>	1	3	Call heard, bat not seen.
20:28- 20:30	Passes	<i>P. auritus</i>	1	2	Call heard, bat not seen.
20:28- 20:30	Passes	<i>Myotis bechsteinii</i>	1	2	Call heard, bat not seen.
20:29	Pass	<i>P. pipistrellus</i>	1	1	Call heard, bat not seen.
20:29	Pass	<i>P. auritus</i>	1	3	Call heard, bat not seen.
20:30	Passes	<i>P. pipistrellus</i> & <i>Pipistrellus nathusii</i>	1 of each	1	Calls heard, bats not seen.
20:30	Pass	<i>P. pipistrellus</i>	1	3	Call heard, bat not seen.
20:31	Pass	<i>P. auritus</i>	1	3	Call heard, bat not seen.
20:32	Pass	<i>P. pygmaeus</i>	1	3	Call heard, bat not seen.
20:33	Pass	<i>M. daubentonii</i>	1	1	Call heard, bat not seen.



20:34	Pass	<i>P. auritus</i> & <i>N. noctula</i>	1 of each	3	Calls heard, bats not seen.
20:35	Pass	<i>P. pygmaeus</i>	1	2	Call heard, bat not seen.
20:35	Pass	<i>P. auritus</i>	1	1	Call heard, bat not seen.
20:36-20:37	Pass	<i>P. auritus</i>	1	3	Call heard, bat not seen.
20:37	Pass	<i>P. pipistrellus</i>	1	3	Call heard, bat not seen.
20:38	Pass	<i>E. serotinus</i>	1	3	Call heard, bat not seen.
20:38	Pass	<i>E. serotinus</i>	1	2	Call heard, bat not seen.
20:38	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	3	Calls heard, bats not seen.
20:38-20:42	Passes	<i>P. auritus</i>	1	2	Call heard, bat not seen.
20:39	Pass	<i>M. nattereri</i>	1	3	Call heard, bat not seen.
20:40	Pass	<i>M. mystacinus</i>	1	2	Call heard, bat not seen.
20:40	Roosting	<i>R. hipposideros</i>	1	1	<b>One bat seen flying inside enclosed part of barn toward southern gable end.</b>
20:41	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	3	Calls heard, bats not seen.
20:41	Pass	<i>M. daubentonii</i>	1	2	Call heard, bat not seen.
20:42	Emergence	<i>R. hipposideros</i>	1	1	<b>Bat flew out of barn through the gap around the small door on the south-western elevation.</b>
20:43-20:44	Pass	<i>P. pipistrellus</i>	1	3	Call heard, bat not seen.
20:44-20:51	Passes	<i>N. leisleri</i>	1	2	Call heard, bat not seen.
20:45	Pass	<i>P. auritus</i>	1	3	Call heard, bat not seen.
20:46	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1 of each	3	Calls heard, bats not seen.
20:46	Roosting	<i>R. hipposideros</i>	1	1	<b>One bat seen flying inside enclosed part of barn toward southern gable end. Night roosting.</b>
20:47	Pass	<i>M. daubentonii</i>	1	3	Call heard, bat not seen.
20:47	Pass	<i>M. daubentonii</i>	1	2	Call heard, bat not seen.

20:48	Pass	<i>Myotis nattereri</i>	1	3	Call heard, bat not seen.
20:50	Foraging	<i>R. hipposideros</i>	1	3	Bat seen foraging in car park/garden, flying around surveyor.
20:50	Pass	<i>P. pipistrellus</i>	1	3	Call heard, bat not seen.
20:50	Roosting	<i>R. hipposideros</i>	2	1	<b>Two bats seen flying inside enclosed part of barn toward southern gable end. Night roosting.</b>
20:51	Pass	<i>M. nattereri</i>	1	2	Call heard, bat not seen.
20:52	Pass	<i>P. auritus</i>	1	3	Call heard, bat not seen.
20:54-20:59	Passes	<i>N. noctula</i>	1	2	Call heard, bat not seen.
20:55	Pass	<i>P. pipistrellus</i> & <i>N. noctula</i>	1 of each	3	Calls heard, bats not seen.
20:55	Pass	<i>P. auritus</i>	1	3	Call heard, bat not seen.
20:55	Pass	<i>P. pipistrellus</i>	1	3	Call heard, bat not seen.
20:55	Pass	<i>P. auritus</i>	1	2	Call heard, bat not seen.
20:56	Pass	<i>Myotis</i> sp.	1	1	Call heard, bat not seen.
20:58	Pass	<i>P. auritus</i> & <i>P. pipistrellus</i>	1	3	Call heard, bat not seen.
20:59	Pass	<i>R. hipposideros</i>	1	2	Call heard, bat not seen.
21:04	Pass	<i>M. daubentonii</i> & <i>P. pipistrellus</i>	1 of each	3	Calls heard, bats not seen.
21:06	Roosting	<i>R. hipposideros</i>	3	1	<b>Three lesser horseshoe bats seen roosting on ceiling on internal inspection. Night roosting.</b>
21:06	Survey terminated as it was too dark to see any further emergence activity.				
Notes	Internal temperature at the start of the survey was 16.2°C and at the end of the survey the internal temperature was 15.2°C. A small bird (unidentified) was seen flying in and out of the open-fronted section of the barn at the start of the survey. A baby rabbit <i>Oryctolagus cuniculus</i> was seen once in the car park area during the survey. A sparrowhawk <i>Accipiter nisus</i> was seen over the Site at the start of the survey. Other bird calls heard during the survey include; green woodpecker <i>Picus viridis</i> , raven <i>Corvus corax</i> and buzzard <i>Buteo buteo</i> .				

**A total of three lesser horseshoe bats were seen roosting in the barn (toward the southern gable end) during internal inspection at the start of the survey. One common pipistrelle bat was recorded emerging from the gap around small barn door on western elevation of**

the barn. Three lesser horseshoe emergences were recorded during the survey (two from the gap above the garage door and one from the gap around the small door on the south-western elevation). At the end of the survey three lesser horseshoe bats were seen roosting on the ceiling during internal inspection and were using barn as night roost in addition to its role as day roost.

Table 5.3. Dawn Re-entry Survey – 18<sup>th</sup> September 2020. Sunrise: 06:48

Activity		Details			
Time	Details	Species	No. of bats	Surveyor No.	Location/Behaviour
05:02	Roosting	<i>R. hipposideros</i>	4	1	Internal inspection undertaken and four lesser horseshoe bats seen roosting on the ceiling of the barn, toward the southern gable end.
05:59	Re-entry	<i>R. hipposideros</i>	1	1	Bat flew from east into open-fronted section of barn and entered through the gap around the garage door.
06:02	Passes	<i>P. pipistrellus</i>	1	4	Calls heard, bat not seen.
06:06	Commuting	<i>P. pygmaeus</i>	1	1	Bat seen flying over barn from east to north, close to the roof.
06:06	Commuting	Unidentified bat	1	3	Bat seen flying over rooftop, no echolocation call detected.
06:09	Pass	<i>P. pipistrellus</i>	1	1	Call heard, bat not seen.
06:13	Re-entry	<i>R. hipposideros</i>	1	1 & 3	Bat flew from east into open-fronted section of barn and entered through the gap around the garage door.
06:15	Re-entry	<i>R. hipposideros</i>	1	1	Bat flew from east into open-fronted section of barn and entered through the gap around the garage door.
06:19	Re-entry	<i>Myotis brandti</i>	1	1	Bat flew under roof tiles at the corner of the two buildings, where the two sections of the L-shaped roof meet.
06:20	Foraging	<i>P. pipistrellus</i>	1	4	Bat seen flying around courtyard/car park area.
06:22	Commuting	Unidentified bat	1	1	One bat flew from west and over the building to the north. No echolocation call detected and too dark to see bat clearly.
06:23	Foraging	<i>P. pipistrellus</i>	1	4	Bat seen flying around courtyard/car park area.
06:24	Re-entry	<i>R. hipposideros</i>	1	1	Bat flew from east into open-fronted section of barn and entered through the gap around the garage door.
06:52	Roosting	<i>R. hipposideros</i>	8	1	Eight lesser horseshoe bats seen roosting inside the barn toward

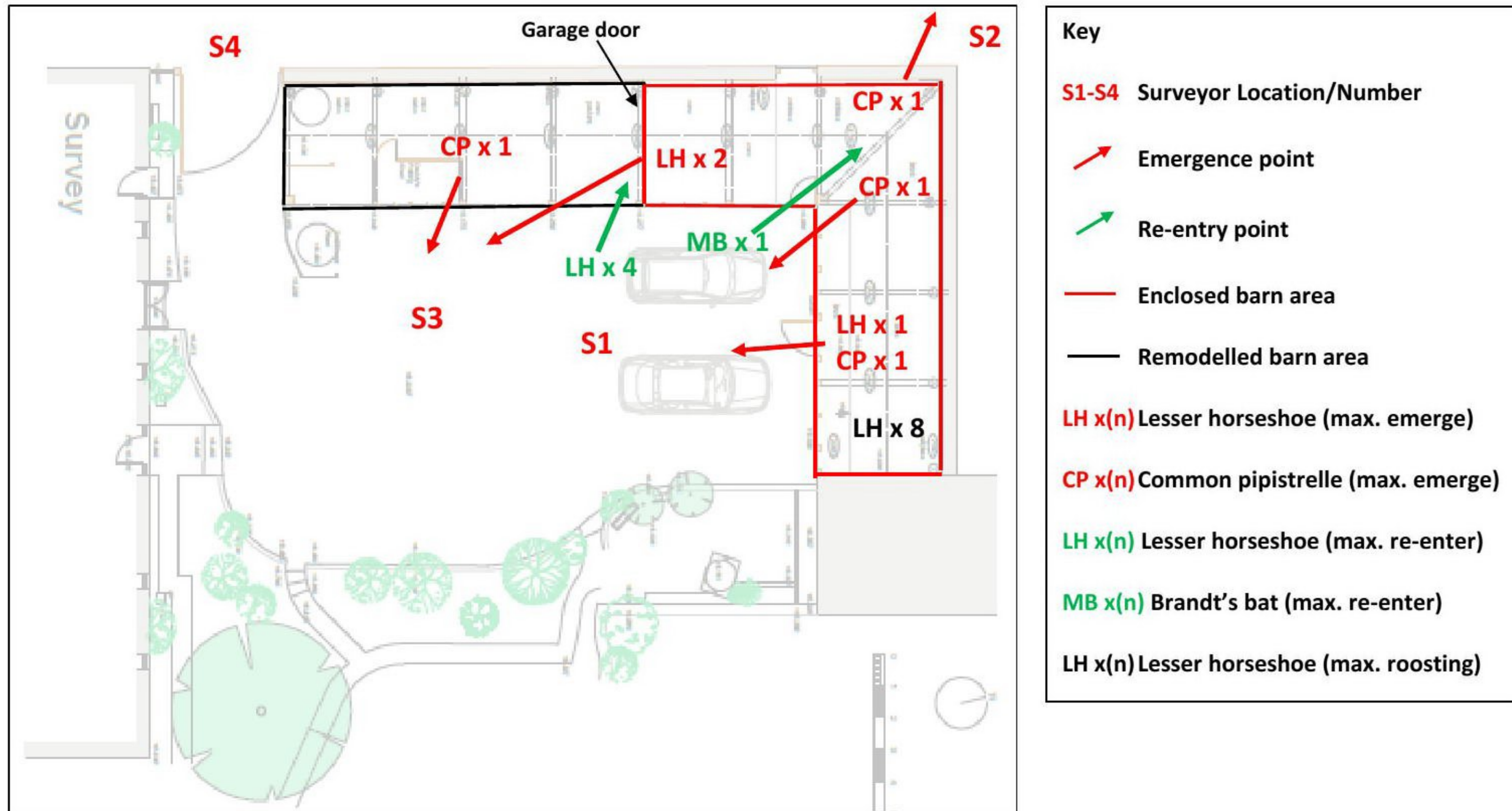
					<b>the southern gable end, at the end of the survey.</b>
07:00	Survey terminated as no further re-entry activity observed.				
<b>Notes</b>	Internal temperature at the start of the survey was 12.6°C and at the end of the survey the internal temperature was 11.2°C.				

A total of four lesser horseshoe bats were seen roosting inside the barn toward the southern gable end at the start of the survey. Four lesser horseshoe bats were seen re-entering the barn through the gaps around the garage door. One Brandt's bat re-entered under roof tiles at the corner of the two buildings, where the two sections of the L-shaped roof meet. At the end of the survey eight lesser horseshoe bats were seen roosting on the ceiling of the barn toward the southern gable end.



**Figure 1. Phase 1 Habitat Survey & Preliminary Roost Assessment Results (image from Google maps)  
(NB Site comprises L-shaped barn)**





**Figure 2. Bat Surveyor Positions/Numbers & Emergence/Re-entry Points.**  
 (Plan provided by client, amended by Wild Service)

## 4 Conclusions and Recommendations

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### 4.1 Discussion

#### Bats

- 4.1.1 The PEA survey and bat emergence/re-entry surveys confirmed the barn supports a summer non-maternity day roost for two common pipistrelle bats, a summer non-maternity day roost for a Brandt's bat. The southern part of the barn also supports a summer non-maternity day roost for eight lesser horseshoe bats and a night roost for three lesser horseshoe bats. Bats and their resting places are protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017.
- 4.1.2 Incidental records confirm the adjoining barn and main house also support a summer non-maternity day roost for a small number of common pipistrelle bats, and the area surrounding the barn is an important foraging/commuting habitat for several species of bats including lesser horseshoe, serotine, Daubenton's bat, whiskered bat, noctule, Leisler's bat, brown long-eared bat, soprano pipistrelle, Natterer's bat, and Bechstein's bat.
- 4.1.3 Due to the confirmed presence of a summer non-maternity day roost for lesser horseshoe, common pipistrelle bats and a Brandt's bat, and a night roost for lesser horseshoe bats, it will be necessary to apply for a European Protected Species (EPS) mitigation licence from Natural England prior to commencing any works. Details of the mitigation strategy must include plans for the compensation roosts showing the proposed bat roosting opportunities, timetabling of works and other necessary measures to avoid risks to bats. It should be noted that planning permission is required prior to applying for an EPS licence for developments.
- 4.1.4 The roof void of the southern part of the barn is to be retained for the use of bats, while the northern part of the barn is to be sectioned off and used for storage. In order to prevent the current items being contaminated by bat faeces in the southern part of the barn, the client plans to install a ceiling to separate the roof void from the rest of the barn. It is our understanding that the roof will not be affected during



works. This will necessitate inserting a 300mm long x 200mm high slot in the upper wall of the barn to enable bats to access the barn and the access slot should be created before any other works commence following the timings below. The access slot should be fitted with cowling to prevent ingress of elements and a hopper behind the slot (within the bat house) to prevent jackdaws entering.

- 4.1.5 Should Natural England grant the EPS licence, it will be necessary to complete the works under the supervision of a bat licenced ecologist outside the main activity period. Specifically, installation of a false ceiling in the southern part of the barn and the wall to divide the southern and northern part of the barn should occur between November to mid-April, so that works are complete when bats return in late April/May. A detailed working method statement should also be produced as part of the EPSL application and in order to comply with the planning permission conditions.
- 4.1.6 Two Schwegler 1WQ summer and winter bat boxes should be installed on the exterior walls of the barn or other buildings within the garden before any barn works begin in order to provide additional roosting habitat and potential receptor sites for any bats discovered during the proposed works. These boxes are suitable for summer and winter roosting and will provide potential roost sites all year round as they will be left in place to act as long-term roosting sites.
- 4.1.7 Bat boxes and entrances to bat lofts must be located away from any lighting, as lighting has been shown to deter bats from using mitigation features. Prior to the start of any works, the licenced bat ecologist will inspect the interior of the barn and assuming that no bats are found, then works may proceed under the ecological supervision of the licenced ecologist.
- 4.1.8 Any lining to be used on the inner faces of the barn should be traditional bitumastic felt, Type 1, rather than modern breathable membranes such as Tyvek to ensure that any bats using the loft space do not become entangled in the fibres of the breathable membrane and can grip the surface of the felting. Timbers should be exposed where possible. All timber treatments will be suitable for use in bat roosts as per the link below:
- [https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/589611/timber-treatment-table1.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/589611/timber-treatment-table1.pdf).

4.1.9 Bat boxes should be placed under the eaves and at minimum heights of 3m. Ideally, bat boxes should face in different directions, with south-west and south-east tending to be favoured by bats. Examples of bat boxes are provided in the Ecological Enhancements Appendix below.

4.1.10 It is recommended that any proposed lighting should be designed sensitively to minimise light spill and potential impacts on bats in accordance with best practice, as outlined in *Bats and Lighting in the UK* (Stone, 2013). This includes:

- All luminaires should lack UV elements when manufactured. Metal halide, fluorescent sources should not be used.
- LED luminaires should be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (ideally <2700Kelvin or >550nm) should be adopted to reduce blue light component, as redder light is preferable for bats.
- <0.2 lux on horizontal plane good, hedgerow lighting natural tends to be <1lux
- Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Blue/white light should be avoided, or if mercury lamps are installed, these should be fitted with UV filters.
- Internal luminaires can be recessed where installed in proximity to windows to reduce glare and light spill.
- Accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it below horizontal plane.
- The use of specialist bollard or low-level downward directional luminaires to retain darkness above can be considered.
- Column heights should be carefully considered to minimise light spill.
- Reducing the height of light units to keep the light as close to the ground as possible and reduce the volume of illuminated space.
- Only luminaires with an upward light ratio of 0% should be used.
- Luminaires should always be mounted on the horizontal, i.e. no upward tilt. Ideally the angle of the luminaire should be less than 70 degrees to avoid upward light spill.

- Any external security lighting should be set on people-activated motion-sensors and short (1min) timers.

## **Birds**

4.1.11 Three swallow's nests were recorded in the remodelled northern section of the barn and there were no nests in the more enclosed southern section. All birds are protected under Section 1 of the Wildlife and Countryside Act 1981 (as amended). It is therefore generally unlawful to intentionally kill or injure a bird, damage or destroy an occupied nest or take or destroy eggs other than in exceptional prescribed circumstances. Therefore, development operations should take care to avoid the risk of harm to birds and their nests, especially during the nesting season (generally considered to be March to August). Construction works to the northern remodelled section of the barn should be undertaken outside the main nesting season and where this is not possible a suitably qualified ecologist should be engaged to check for nesting birds and to provide advice on the most appropriate way to proceed.

4.1.12 As it is our understanding that the northern remodelled section will be enclosed, which will prevent swallows reaching their nests, in order to provide alternative nesting habitat for swallows, an overhang should be created under the eaves of the barn and two swallow cups should be fitted. Ideally bird boxes should face in a north to south-east direction. Examples are provided in the Ecological Enhancements Appendix below.

## **Great Crested Newts (GCN)**

4.1.13 GCN and their resting/breeding places are protected under the WCA 1981 and CHS Regs 2017. It is our understanding that conversion of the barn into a storage facility will involve levelling of the floor and constructing a low wall. These works will need to occur during March to April (to be covered under the bat licence) when the majority of newts should be in the ponds and the bats would be expected to be roosting in hibernation sites elsewhere. Immediately prior to works, a GCN licensed ecologist will check for any amphibians as a precautionary measure and will then supervise the releveling works and wall construction.

- 4.1.14 All building materials will be stored on pallets to raise them from the ground. Any trenches built during construction shall be backfilled before nightfall, or otherwise equipped with a means of escape or covered to avoid animals becoming trapped.
- 4.1.15 Construction of a log pile and hibernaculum (as shown in the Ecological Enhancements Section) in the garden prior to any works will provide useful shelter for any local amphibians and act as a receptor in the unlikely event that any are found in the barn.
- 4.1.16 Further details can be provided in a GCN risk avoidance mitigation strategy.

### **Hedgehogs**

- 4.1.17 Due to the possibility for hedgehogs to use the garden surrounding the barn for commuting/foraging, any trenches built during construction shall be backfilled before nightfall, or otherwise equipped with a means of escape or covered to avoid animals becoming trapped.
- 4.1.18 Any fencing can be made more permeable to wildlife, such as hedgehogs, through leaving small gaps of 13x13cm under fences.
- 4.1.19 Hedgehog shelters in the form of log piles/hedgehog home can be installed in the garden to create more areas of shelter for this endangered species. See Ecological Enhancements section below.

## **4.2 General Recommendations**

- 4.2.1 There appear to be no other obvious and immediate issues for this development with regard to any other species protected under the Wildlife and Countryside Act 1981 (as amended) and the Conservation of Habitats and Species Regulations 2017 and no further dedicated surveys for any other species are recommended. However, in the unlikely event that any protected species listed in Section 2 are found on the site during the works then all works must cease immediately, and the advice of a suitably qualified ecologist must be sought.
- 4.2.2 The ecological value of the site can be enhanced through planting native species and/or those of value to wildlife, i.e. producing fruits, seeds, nuts or single-flowers. Leaving patches of unmown grass and tall herb as well as creating compost heaps/log



piles creates valuable wildlife habitat, particularly for invertebrates, reptiles, amphibians and small mammals including hedgehogs<sup>2</sup>.

- 4.2.3 Ideally only pesticides branded as 'wildlife friendly' should be used. Wildlife planting tips and advice can be found here: <https://www.gloucestershirewildlifetrust.co.uk/wildlife/wildlife-gardening>. Further information is provided in the Ecological Enhancements Appendix below.

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<sup>2</sup> The State of Britain's Hedgehogs 2015, publicised at a special UK summit on hedgehogs: since 2000, records of the species have declined by half in rural areas and by a third in urban ones. Hedgehogs are also a species of 'Principal Importance' under Section 41 of the Natural Environment and Rural Communities (NERC) Act 2006 and therefore need to be taken into consideration by a public body when performing any of its functions with a view to conservation

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UK Biodiversity Framework <http://jncc.defra.gov.uk/page-6189>



## Appendix 1: Legislation

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Statutory nature conservation sites and protected species are a ‘material consideration’ in the UK planning process (DCLG, March 2012). Where planning permission is not required, for example on proposals for external repair to structures, consideration of protected species remains necessary given their protection under UK law.

The **Conservation of Habitats and Species Regulations 2017** transpose the requirements of European Directives such as the Habitats Directive and Birds Directive<sup>3</sup> into UK law, enabling the designation of protected sites and species at a European level.

The **Wildlife and Countryside Act 1981** (as amended) forms the key piece of UK legislation relating to the protection of habitats and species. The **Countryside and Rights of Way Act 2000** provides additional support to the 1981 Act, for example, increasing the protection of certain reptile species. Specific protection for badger is provided by the **Protection of Badger Act 1992**. The **Wild Mammals (Protection) Act 1996** sets out the welfare framework with respect to wild mammals prohibiting a range of activities which may cause unnecessary suffering.

The Government has a duty to ensure that parties take reasonable practicable steps to further the conservation of habitats and species of Principal Importance for Conservation in England listed under Section 41 of the **Natural Environment and Rural Communities Bill 2006**<sup>4</sup>. In addition, the 2006 Act places a Biodiversity Duty on public authorities who ‘must, in exercising [their] functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity’ (Section 40 (1)). Criteria for selection of priority habitats and species include, for example, international threat (such that species may be protected in their strong holds) and marked national decline.

The **National Planning Policy Framework**<sup>5(1)</sup> states (in section 11) that the planning system should minimise impacts on biodiversity, providing net gains in biodiversity, where possible. It also states that local planning authorities and planning policies should:

- Plan positively for the creation, protection, enhancement and management of networks of biodiversity and green infrastructure.
- Take account of the need to plan for biodiversity at a landscape-scale across local authority boundaries.
- Identify and map components of the local ecological networks, including: international, national and local sites of importance for biodiversity, and areas identified by local partnerships for habitat restoration or creation.
- Promote the preservation, restoration and re-creation of priority habitats, ecological networks and the recovery of priority species populations, linked to national and local targets and identify suitable indicators for monitoring biodiversity in the plan.

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<sup>3</sup>Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora, and Council Directive 79/409/EEC on the Conservation of Wild Birds, respectively.

<sup>4</sup>The **NERC Act** refers to “*species of principle importance for the conservation of biodiversity*”, which translates to BAP habitats and species occurring in England.




<sup>5</sup>National Planning Policy Framework (DCLG, March 2012).

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## Appendix 2: Photos



No	Photo	Description
1		Three lesser horseshoe bats on the ceiling in the barn as seen during Preliminary Roost Assessment.
2		Swallow's nests on the ceiling of the barn.






No	Photo	Description
3		View of garden near barn.
4		View of northern part of barn.
5		View of southern part of barn and adjoining barn – gable end view (adjoining barn not part of Site).



No	Photo	Description
6	 A photograph showing the interior of a barn. The ceiling is made of dark wooden beams in a gabled structure. A black punching bag with a red 'X' and the word 'MAX' in white is hanging from a blue strap. In the foreground, there is a green wheelbarrow and a white chair. The background shows a doorway leading to another part of the barn.	Interior of northern remodelled part of barn.
7	 A photograph showing the interior of a barn. The ceiling is made of dark wooden beams. A large green mesh bag is hanging from the ceiling. The background shows a brick wall and some wooden beams.	Interior of southern part of barn.

No	Photo	Description
8	 A photograph showing the interior of a barn. The structure features large, dark wooden beams and a gabled roof. The walls are made of light-colored stone or brick. In the foreground, there is a workbench with various tools and equipment, including a ladder and some boxes. The lighting is somewhat dim, highlighting the textures of the wood and stone.	Interior of southern section of barn
11	 A photograph of a garden pond. The pond is rectangular and filled with water, surrounded by a low stone wall. Large, green, heart-shaped leaves of a water lily or similar plant are growing in the pond. The background shows a lush garden with various trees and shrubs, including a large tree with a thick trunk on the left.	Garden pond 1.



No	Photo	Description
12		Barn viewed from outside garden.
13		Pond 4 on neighbouring land.
14		Pond 4.



## Appendix 3: Habitat Suitability Assessment GCN

In order to evaluate the habitat suitability (HSI) for great crested newts a series of factors must be considered as described below. A description of each factor considered in the HSI is provided below and the value ascribed to each factor is provided in the table below the description. The overall **Habitat Suitability Index** for the site is calculated as the mean of the suitability indices.

HABITAT SUITABILITY ASSESSMENT GCN – DESCRIPTION OF FACTORS FOR ASSESSMENT	
HS1 - Geographic Location	Based on known distribution of great crested newts, Gloucestershire is located within Zone A and has a high probability of the presence of great crested newts within each 10km square.
HS2 - Pond Area	Pond area is a determinant of the magnitude of biological productivity of the pond ecosystem upon which the newt population depends. Ponds between 500 and 750m <sup>2</sup> provide the optimal size but small ponds under 50m <sup>2</sup> are given a nominal value.
HS3 - Pond Permanence	Pond permanence is essential to permit the completion of metamorphosis in any given year. However, intermittent (every few years) drying out may be beneficial in excluding fish populations. The optimum drying out frequency is assumed to be one in every three to four years.
HS4 - Water Quality	Although the adult great crested newt is relatively tolerant of eutrophic conditions, the larvae are more vulnerable and require reasonably well aerated water with a number of aquatic invertebrates.
HS5 - Pond Shading	Shade counteracts the growth of macrophytes and the benefits they provide. Additionally, heavy tree cover increases the organic content through leaf fall potentially causing eutrophication. Great crested newts tend to favour ponds with a shade cover of between 0% and 60%.
HS6 - Waterfowl	Common waterfowl in naturally occurring numbers have little effect on great crested newt populations, however if at high artificial numbers due to supplementary feeding they can seriously damage the habitat.
HS7 - Fish	The effect of fish on newt populations varies across species and ponds. However, in general the presence of fish species is detrimental to newt populations. In particular the stickleback has a very serious impact, through predation and competition.
HS8 - Pond density	A network of suitable ponds within a landscape increase the chances of great crested newts in an area, through the metapopulation processes of recolonisations from surrounding ponds if any one population becomes extinct.
HS9 - Proportion of 'Newt Friendly' Habitat	The habitat occupied by crested newts is highly variable and we do not understand the species' detailed requirements at different phases of their life on land. However, scrub, unimproved grassland, woodland and gardens are regarded as newt friendly habitat, unlike improved pasture, arable and urban habitats. Additionally, features such as ditches and hedges enhance the habitat suitability of any site. Features such as roads and rivers form serious barriers

	dependent on width and flow of traffic and water. Such barriers cause issues with direct mortality but also through their impact on metapopulation dynamics.
<b>HS10 - Macrophyte Content</b>	Macrophytes are important for newts as they provide habitat for their prey organisms, provide cover from predators and a substrate for egg attachment.

**Evaluating the suitability of habitat for the great crested newt (*Triturus cristatus*):  
Oldham *et al* 2000**

**Garden ponds 1, 2 and 3**

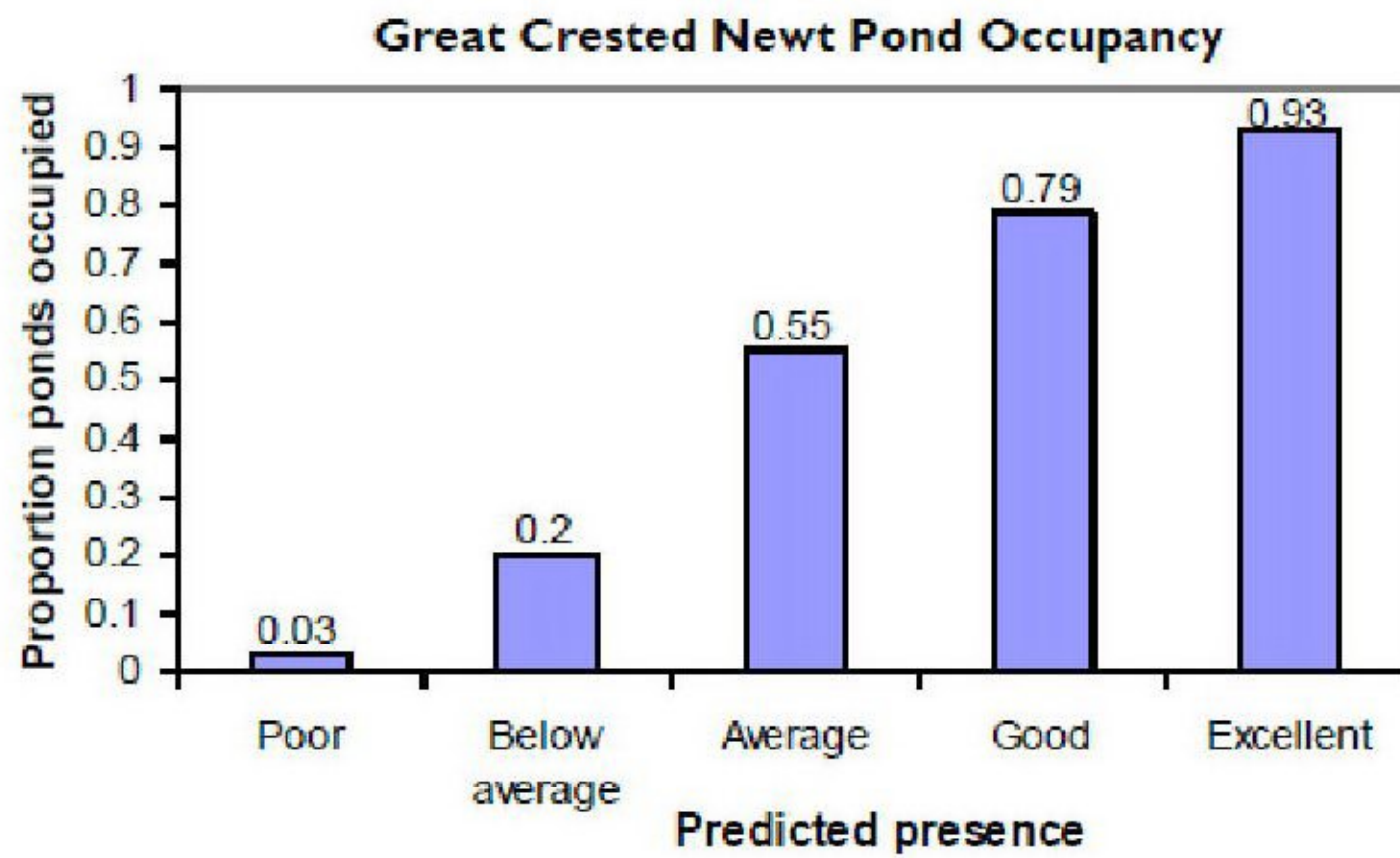
Habitat Suitability Index	Factor	Value	Rating for Index
HS1	Geographic Location	1.00	<i>Excellent</i>
HS2	Pond Area	0.05	<i>Poor</i>
HS3	Drying out frequency	0.90	<i>Excellent</i>
HS4	Water Quality	0.33	<i>Poor</i>
HS5	Shade	0.20	<i>Poor</i>
HS6	Fowl	0.67	<i>Average</i>
HS7	Fish	0.67	<i>Average</i>
HS8	Pond Count	0.65	<i>Average</i>
HS9	Terrestrial habitat	0.33	<i>Poor</i>
HS10	Macrophytes	0.80	<i>Excellent</i>
<b>Overall HSI Value</b>		<b>0.43</b>	<b>Poor</b>

**Pond 4 off-site (nearest to barn)**

Habitat Suitability Index	Factor	Value	Rating for Index
HS1	Geographic Location	1.00	<i>Excellent</i>
HS2	Pond Area	1.00	<i>Excellent</i>
HS3	Drying out frequency	0.90	<i>Excellent</i>
HS4	Water Quality	0.33	<i>Poor</i>
HS5	Shade	1.00	<i>Excellent</i>
HS6	Fowl	0.67	<i>Average</i>
HS7	Fish	0.33	<i>Poor</i>
HS8	Pond Count	0.65	<i>Average</i>
HS9	Terrestrial habitat	0.33	<i>Poor</i>
HS10	Macrophytes	0.40	<i>Poor</i>
<b>Overall HSI Value</b>		<b>0.60</b>	<b>Below Average</b>



The graph below is reproduced from the ARG-UK Advice Note 5 and shows the predicted presence of great crested newts in relation to the Habitat Suitability Index value.



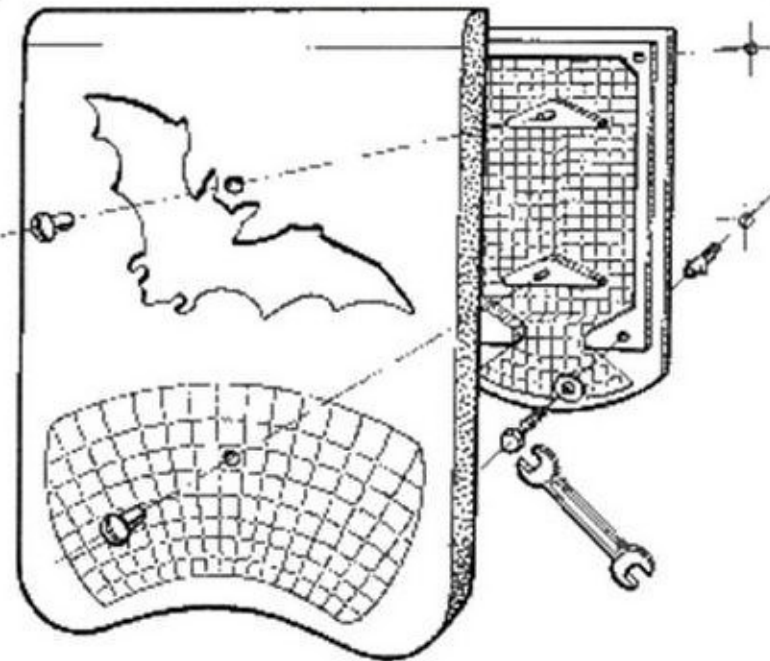
## Appendix 4: Ecological Enhancements

### BAT ROOSTING FEATURES

Schwegler 1FF bat box



Schwegler 1WQ Summer & Winter bat





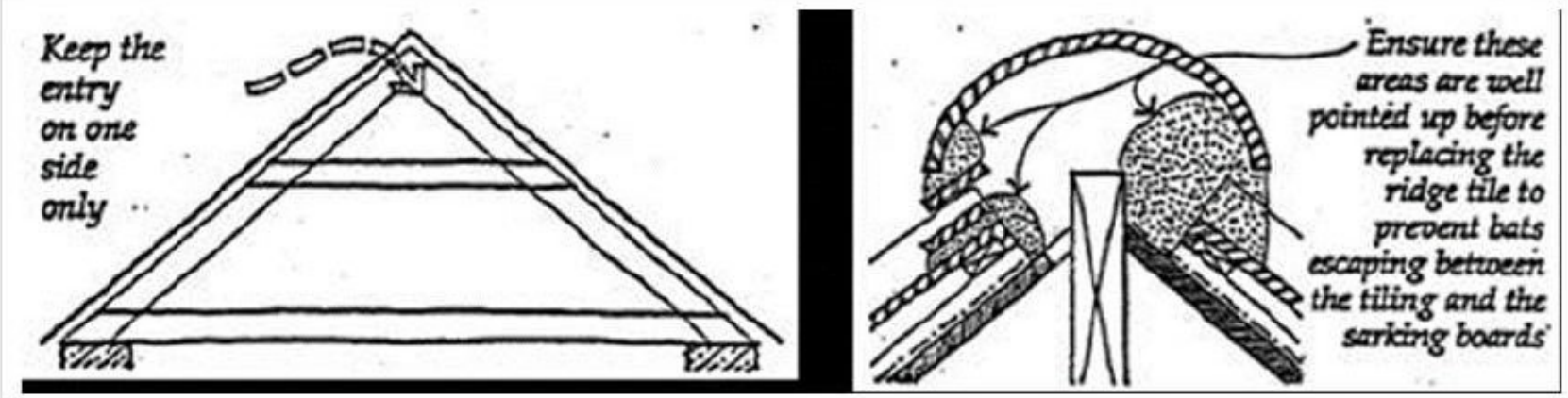
**Habibat 001 Bat Box – integral bat box, fitted into wall**



**Schwegler 2FN bat box for installation in trees**



**Diagrammatic view of ridge tile and cross section through ridge tile** showing access point (taken from Scottish Natural Heritage 1996). Bitumastic lining must be used near/on the ridge beam to ensure bats can only have contact with this type of membrane to avoid any possible entanglement with a breathable membrane.





**BIRD BOXES**

**Various designs of swift boxes**



**House Sparrow terrace box**



**Swallow Cup**



**Hole-fronted bird box (for trees)**



**Open-fronted bird box (for trees)**



**House Martin Terrace Box**

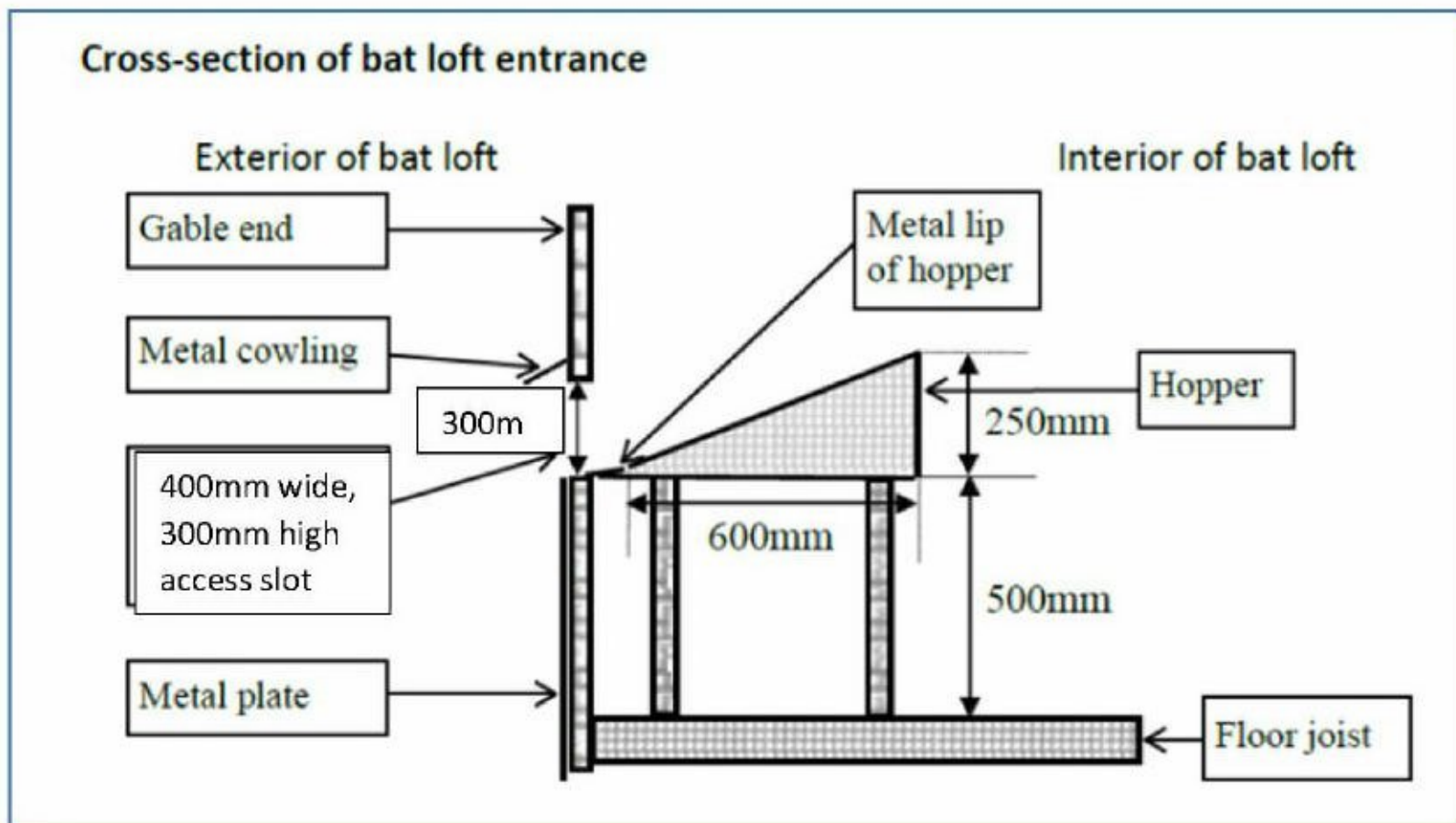




**Bat House Photographs**







## HEDGEHOG HOUSE

# Make a deluxe hedgehog house



**You will need**

- 20mm FSC plywood boards cut to the sizes shown
- Hammer and nails
- 2 metal hinges
- Soil
- Dry leaves
- Straw or dry grass
- Newspapers
- Polythene sheeting

*Birch is ideal*

**1** Construct the hedgehog house from the following diagram and dimensions.

**2** Put the newspaper and straw or dry grass inside, cover the house with polythene sheeting, then pack soil and dead leaves around the outside.

Do not creosote or treat the wood

Make sure the entrance tunnel faces south, and is kept clear at all times

The roof is hinged so you can clean the box in future

raised up on feet

[www.wildlifewatch.org.uk](http://www.wildlifewatch.org.uk)





Many wildlife species benefit greatly from considerate planting choices that still meet our practical and aesthetic needs. Plants and trees provide food for wildlife as well as places to nest and rest. Vegetation providing a variety of these functions creates an environment more beneficial for wildlife.

## Non native species

Native species provide the best habitat for UK wildlife but there are also many non-native species, which are single flowering and/or provide fruits/nuts/seeds that can be used as food sources for insects, birds and small mammals. When using these non-native species in planting schemes, care should be taken to avoid invasive species such as Cotoneaster and Rhododendron. This is especially important when sites are adjacent to open countryside particularly nature reserves.



Butterfly bush

## Uses of Wildlife Planting

Wildlife value can be easily incorporated into visually pleasing and useful green areas and amenity spaces, such as borders, grass verges and tree screens.

**Attractive Borders:** Well selected decorative borders can be valuable for many insects and birds. Native plants can be mixed with single flowering ornamental species to add aesthetic interest and increase the flowering period of a planting scheme.

**Shrubs and hedges:** Native spiky species like blackthorn and hawthorn are effective barriers when used in hedges. They also provide an attractive feature at all times of year especially when in blossom and fruit. Bushy areas of foliage provide useful nesting and feeding areas for birds and small mammals, as well as foraging/commuting corridors for bats.

**Grasses mixes and verges:** Leaving uncut areas of suitable grasses provides great wildlife value and is economical to manage. Diverse grassy areas and verges also create an attractive human environment with different flowers and colours. There are a range of native grass and flower mixes for various soil types available on the market.



Wild flower grass mix





## Selecting Suitable Species

There are wildlife friendly species suitable for all situations, from fields, verges, shady corners or small gardens. Listed below are native wildlife friendly plant species organised by type and suitability for different locations.

### Large Trees

- Ash *Fraxinus excelsior*
- Beech *Fagus sylvatica*
- English Elm *Ulmus procera*
- Oak *Quercus robur* or *Q. petraea*
- Small-leaved lime *Tilia cordata*
- White willow *Salix alba*
- Wild cherry *Prunus avium*



White willow

### Medium/small trees

- Alder *Alnus glutinosa*
- Aspen *Populus tremula*
- Crab apple *Malus sylvestris*
- Field maple *Acer campestre*
- Holly *Ilex aquifolium*
- Rowan *Sorbus aucuparia*
- Silver birch *Betula pendula*
- Yew *Taxus baccata*



Tussocky grassland

### Native shrubs

- Blackthorn *Prunus spinosa*
- Dogwood *Cornus sanguinea*
- Elder *Sambucus nigra*
- Guelder rose *Viburnum opulus*
- Hawthorn *Crataegus monogyna*
- Hazel *Corylus avellana*



Blackthorn

### Plants for shady areas

- Archangel *Lamium galeobdolon*
- Betony *Stachys officinalis*
- Bluebell *Hyacinthoides non-scriptus*
- Bugle *Ajuga reptans*
- Foxglove *Digitalis purpurea*
- Ground ivy *Glechoma hederacea*
- Lily of the valley *Convallaria majalis*
- Lords-and ladies/cuckoopint *Arum maculatum*
- Nettle-leaved bellflower *Campanula trachelium*
- Primrose *Primula vulgaris*
- Sweet violet *Viola odorata*
- Wild daffodil *Narcissus pseudonarcissus*

### Plants for marshy areas & pond edges

- Bugle *Ajuga reptans*
- Hemp agrimony *Eupatorium cannabinum*
- Marsh marigold *Caltha palustris*
- Marsh woundwort *Stachys palustris*
- Meadowsweet *Filipendula ulmaria*
- Purple loosestrife *Lythrum salicaria*
- Ragged robin *Lychnis flos-cuculi*
- Water avens *Geum rivale*
- Water forget-me-not *Myosotis scorpioides*
- Water mint *Mentha aquatica*
- Water violet *Hottonia palustris*
- Yellow flag *Iris pseudacorus*



**Beneficial cultivated plants  
(generally non-natives)**

Grecian windflower *Anemone blanda*  
Angelica *Angelica archangelica*  
Aubretia *Aubretia deltoidea*  
California poppy *Eschscholtzia californica*  
Candytuft *Iberis sempervirens*  
Christmas rose *Helleborus niger*  
Cosmos *Cosmos bipinnatus*  
Evening primrose *Oenothera biennis*  
Fleabane *Erigeron spp.*  
Forget-me-not *Myosotis spp.*  
French marigold *Tagetes patula*  
Globe thistle *Echinops ritro*  
Grape hyacinth *Muscari botryodes*  
Hollyhock *Althaea rosea*  
Honesty *Lunaria rediviva*  
Ice plant *Sedum spectabile*  
Lenten rose *Helleborus orientalis*  
Tree mallow *Lavatera spp.*  
Michaelmas daisy *Aster novae-belgii*  
Mint *Mentha x rotundifolia*  
Perennial cornflower *Centaurea montana*  
Perennial sunflower *Helianthus decapetalus*  
Phlox *Phlox paniculata*  
Poached-egg plant *Limnanthes douglasii*  
Red valerian *Centranthus ruber*  
Snapdragon *Antirrhinum majus*  
Spring crocus *Crocus chrysanthus* and hybrids  
Sweet alyssum *Lobularia maritima*  
Sweet bergamot *Monarda didyma*  
Sweet William *Dianthus barbatus*  
Tobacco plant *Nicotiana affinis*  
Wallflower *Cheiranthus cheiri*  
Alpine rock-cress *Arabis alpina*  
Winter aconite *Eranthis hyemalis*  
Yellow alyssum *Alyssum saxatile*

**Native wildflowers for borders**

Agrimony *Agrimonia eupatoria*  
Betony *Stachys officinalis*  
Bluebell *Hyacinthoides non-scriptus*  
Chicory *Cichorium intybus*  
Chives *Allium schoenoprasum*  
Common poppy *Papaver rhoeas*  
Corncockle *Agrostemma githago*  
Cornflower *Centaurea cyanus*  
Corn marigold *Chrysanthemum segetum*  
Cowslip *Primula veris*  
Cuckooflower *Cardamine pratensis*  
Dame's-violet *Hesperis matronalis*  
Devil's-bit scabious *Succisa pratensis*  
Field scabious *Knautia arvensis*  
Foxglove *Digitalis purpurea*  
Goldenrod *Solidago virgaurea*  
Great mullein *Verbascum thapsus*  
Greater knapweed *Centaurea scabiosa*  
Harebell *Campanula rotundifolia*  
Herb-robert *Geranium robertianum*  
Lady's bedstraw *Galium verum*  
Marjoram *Origanum vulgare*  
Meadow cranesbill *Geranium pratense*  
Common mallow *Malva sylvestris*  
Oxeye daisy *Leucanthemum vulgare*  
Primrose *Primula vulgaris*  
Red campion *Silene dioica*  
Snowdrop *Galanthus nivalis*  
Spiked speedwell *Veronica spicata*  
Tansy *Tanacetum vulgare*  
Teasel *Dipsacus fullonum*  
Toadflax *Linaria vulgaris*  
White campion *Silene alba*  
Wild thyme *Thymus drucei*  
Yellow loosestrife *Lysimachia vulgaris*



Marjoram



Cornflower



Perennial sunflower



## Appendix 5: Ecological Experience

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**Elizabeth Pimley:** Head of Ecology & Principle Ecologist, BSc (hons) PhD, CEnv MCIEEM

Elizabeth has worked in both the academic and consultancy ecology sectors since 2000 with a focus on mammalian ecology, particularly badgers, dormice, bats, water voles and otters. Elizabeth manages the Consultancy as well as being involved in project delivery. She has managed ecological projects, ranging in size and type, both in the UK and abroad. She regularly advises clients on the planning process in relation to Ecology. Elizabeth has expertise in a wide variety of ecological survey techniques including Preliminary Ecological Appraisals/Phase 1 habitat assessments and a variety of protected species surveys (e.g. the aforementioned mammal species as well as reptiles and great crested newts).

Elizabeth also devises ecological mitigation schemes, both as part of protected species mitigation licences (e.g. bats, great crested newts, badgers, dormice) and for projects not requiring licensing (e.g. reptiles). She has produced a wide variety of preliminary ecological appraisals, BREEAM/CSH Ecology Assessments, mitigation licences for protected species (including Bat Mitigation Class Licences), Ecological Impact Assessments (EclA), Construction Ecological Management plans, Habitat Regulations Assessments, Biodiversity Enhancement Schemes, Ecological Design Strategies as well as writing for scientific journals, books and magazines.

Elizabeth offers a scientific approach to projects with additional skills in radiotracking, bat call analysis, statistical analysis, home range and compositional habitat analysis and Geographical Information Systems (GIS) mapping. Elizabeth holds Natural England and Natural Resources Wales licences for bats and dormice as well as Natural England licences for great crested newts and water voles. She is also a Registered Consultant of the Bat Mitigation Class Licence (BMCL) and holds a CSCS card.

**Michelle Newman:** Ecologist, BSc (Hons)

Michelle has worked in Ecological Consultancy for several years and has also volunteered for a number of nature conservation organisations over the years. She is experienced in undertaking Phase 1 habitat surveys and protected species surveys including those for bats, birds, otters, water voles, badgers, great crested newts and reptiles (including adder handling experience). She has also undertaken a variety of invertebrate surveys, specialising in bumble bee surveys. She holds a CSCS card and has worked as an Ecological Clerk of Works (ECoW) on a wide variety of sites. Michelle has prepared preliminary ecological appraisals and protected species reports for a range of projects. In addition to project delivery, she is also involved with the management of Wild Service projects and advises clients on the ecological aspects of the planning process. She is experienced in analysing bat call data using a variety of software packages. She is currently working towards personal Natural England licenses for great crested newts, bats and white-clawed crayfish.

**Julia Morrison:** Assistant Ecologist, BSc (Hons)

Julia has been worked with Wild Service for several years. Julia has a keen interest in bat ecology and in addition to undertaking professional bat surveys and assessments, she has also studied bats in Ghana, West Africa. She is also experienced in a range of other ecological surveys including Phase 1 habitat assessments, protected species surveys, reptile surveys and translocations, great crested newt and dormouse surveys. Julia's additional skills include advanced data analysis and GIS mapping using various software packages including QGIS and ArcGIS. In addition to project delivery, she also assists with the management of Wild Service projects. Julia has also spent time volunteering on conservation projects with the Gloucestershire Bat Group and the Gloucestershire Wildlife Trust. Julia is a student member of CIEEM and is currently working towards her Natural England bat and great crested newt licences. Julia is completing a Masters Degree in Applied Ecology at the University of Gloucestershire, where she is undertaking a research project at a Gloucestershire Wildlife Trust wetland reserve on the effects of habitat management on bird diversity and abundance.

**Rebecca McKie:** Graduate Ecologist, BSc (Hons)

Beccy completed an Undergraduate Degree in Environmental Science, during which she gained knowledge and experience in ecology and fieldwork techniques, GIS mapping using QGIS, and environmental law, as well as undertaking various fieldwork projects, such as studying the effect of climate change on invertebrates in hot springs in the Sierra Nevada. She then went on to complete Ecology Training UK's 'Certificate in Ecological Consultancy', during which she gained experience in Phase 1 Habitat and PEA Surveys, survey techniques for protected species, botany, wildlife law, hedgerow assessments and invasive species. Rebecca has also carried out practical volunteering with the Wildlife Trusts, as well as being involved in hedgehog conservation through volunteering at Help a Hedgehog Hospital.





# Wild Service

ECOLOGICAL SERVICES

MITIGATION

CONSERVATION

- We provide ecological surveys and assessments, mitigation, advice and guidance regarding wildlife, plants and habitats for both development and conservation projects throughout the UK.
- Wild Service is the Ecological Consultancy for Gloucestershire Wildlife Trust. As such, the company reinvests its profits into local conservation work.
- We are also part of a wider network of Wildlife Trust Consultancies enabling us to offer national delivery with local expertise.
- We offer the following types of service to clients:

**Ecological Surveys**  
**Protected Species Licences**  
**Ecological Management Plans**  
**Ecological Impact Assessments (ECIA)**  
**BREEAM Assessments**  
**Mitigation and Enhancement**  
**Arboricultural Surveys**  
**Landscape Consultancy Services**  
**Green Infrastructure Planning (Building with Nature)**

Contact us at  
 Wild Service,  
 Conservation Centre  
 Robinswood Hill Country Park  
 Reservoir Road, Gloucester,  
 GL4 6SX  
 TEL: 01452 383 333; Email: [info@wildservice.net](mailto:info@wildservice.net)

Website: <https://wildservice.net/>