

BERNWOOD ECOLOGY

☎ 01296 728351 · ✉ enquiries@bernwood.net · 🌐 www.bernwood.net

Orchard Cottage Radnage Buckinghamshire



Preliminary Ecological Appraisal and Preliminary Roost Assessment

Mr. Matt Roskill

23rd August 2021

Roskill-OC-21.001 (Issue 1)



Proud to be:



Hensmans Farm, Nearton End, Swanbourne, Buckinghamshire, MK17 0SL

Limitations

Ecological assessments can only assess a site at a particular time. This evidence can be used to draw conclusions as to the likely presence or absence of species (animals and plants), population size, use of the site by animals; it is neither definitive nor complete.

Any survey is a snapshot in time and should not be regarded as a complete study. Seasonality and weather conditions may also affect survey results.

The preparation of mitigation strategies, consultation exercise and submission of any licence applications cannot be relied upon until approved [licensed] in writing by third parties. Allowance must be made for both programme and financial change to projects as a result of application failure, amendment or refusal.

Every effort has been taken to provide an accurate assessment of the situation pertaining to this site and information available at the time of the preparation of this report, but no liability can be assumed for omissions, or subsequent changes to design and development.

Surveys have been based on anticipated work resulting from instruction and information supplied at the time of request. Additional works should be anticipated as surveys and proposals for the site progress.

No responsibility will be accepted for any use of or reliance on the contents of this report by any third party.

No responsibility will be accepted for changes or alterations made to this report following submission to Bernwood Ecology client.

Bernwood Ecology, its employees and associates reserve the right to report on any incidents or actions [deliberate or reckless] that result in a breach of licence conditions or are in contravention of existing legislation.

Quality Assurance

Issue 1: 23rd August 2021

Author: J. Sowden, MSc. ACIEEM, Ecologist

Editor: J. Sowden, MSc. ACIEEM, Ecologist

Proof-reader: S. Sanchez, MSc. CIEEM Qualifying Member, Assistant Ecologist, E. Dickins MSc., MCIEEM, Senior Ecologist

Executive Summary

Bernwood Ecology have been instructed to undertake a Preliminary Ecological Appraisal, and Preliminary Roost Assessment (supported with a data search for historical species and site records) of the property known as Orchard Cottage, Radnage. The site includes a main house and five other buildings along with areas of garden, an access track and hedges. The proposals are currently in the draft stages but are likely to include the modification/ demolition of some buildings.

The survey evaluated the habitats onsite within the site boundary generally to be of low ecological value. However, the mature trees which are likely to be the remains of an orchard historically present at the site, an area of semi-improved grassland and hedgerows have higher value and should be retained where possible.

The Preliminary Roost Assessment undertaken by Bernwood Ecology found that Building 1 is a confirmed brown long-eared bat roost, and an inspection at a later date by Eaves Ecology found evidence that Building 5 is also a confirmed bat roost. Buildings 4 and 6 have 'Low' potential to support roosting bats. Buildings 2 and 3 have 'Negligible' potential to support roosting bats.

Further bat surveys are required to inform a European Protected Species License application for Buildings 1 and 5 and to provide sufficient confidence in the absence of roosting bats in Buildings 4 and 6, should these buildings be affected by the proposals. Artificial lighting is to be avoided or minimised within the proposals, particularly on nearby habitats of ecological value or existing/ new bat roosting habitat.

Recommendations are made to minimise the residual risk to reptiles, hazel dormice and other mammals through an Ecological Clerk of Works and best practice measures.

Nesting birds are likely to use the vegetation and buildings at the site; recommendations are made to avoid the damage and destruction of active nests.

Table of Contents

1.	Introduction and Objectives	1
2.	Legal Protection.....	1
	European Protected Species	1
	Widespread Species of Reptile.....	2
	Badgers	2
	Non-native Species.....	3
	Wild Birds	3
3.	Planning.....	4
4.	Methodology.....	5
	Desk Study	5
	Habitat Suitability Index for Great Crested Newt.....	5
	Preliminary Ecological Appraisal.....	5
	Preliminary Roost Assessment	6
	Biosafety and Biosecurity	6
	Scientific Consultation.....	7
5.	Constraints and Limitations	7
	Historical Records.....	7
	Safe Access	7
	Digital Mapping	8
	Mobile Species	8
6.	Results.....	8
	Desk Study	8
	Habitat Suitability Index for Great Crested Newt.....	12
	Preliminary Ecological Appraisal.....	12
	Preliminary Roost Assessment	19
7.	Discussion and Conclusions.....	31
	Designated Sites	31
	Habitats.....	31
	Great Crested Newt	31
	Reptiles.....	32
	Terrestrial Mammals.....	32

Bats	32
Wild Birds	33
8. Recommendations.....	33
Best Practice Measures.....	34
Habitat Retention and Enhancement	34
Reptiles.....	34
Non-Flying Mammals	35
Bats	35
Nesting Birds.....	36
Age of Survey Data.....	36
9. References and Further Reading.....	36
Appendix 1.....	38
Appendix 2.....	39
Appendix 3.....	40
Appendix 4.....	41

1. Introduction and Objectives

- 1.1 Bernwood Ecology were instructed by Mr. Matt Roskill on 12th July 2021 to undertake a Preliminary Ecological Appraisal (PEA) and Preliminary Roost Assessment (PRA) of the buildings present at the property known as Orchard Cottage, Radnage Common Road, Radnage, Buckinghamshire, HP14 4DH (SU 7887 9618) (Appendix 1).
- 1.2 The aims of the survey are to identify any ecological constraints to the development proposals, identify further survey effort required and provide recommendations on ecological enhancements for biodiversity net gain (CIEEM, 2017). As the proposals will directly impact buildings within the site boundary, a PRA was conducted to ascertain whether bats are likely to be using the buildings for roosting, through either the identification of evidence of bat presence or the suitability of the building to support roosting bats.
- 1.3 The proposals are currently in the early design stages, with the extent of the works not yet determined. The works are likely to involve modifications to the main house and demolition of some of the other buildings present at the site.

2. Legal Protection

- 2.1 The finding of this report represents the professional opinion of qualified ecologists and does not constitute professional legal advice. The client may wish to seek professional legal interpretation of the relevant wildlife legislation cited in this report.
- 2.2 The following information is a simplified summary of the legislation and the full text of the Wildlife & Countryside Act 1981 (as amended) (WCA 1981), the Conservation of Habitats and Species Regulations 2017 (2017 Regulations) and other legislation together with current published guidelines should be consulted.

European Protected Species

- 2.3 It is understood that 2017 Regulations will be further amended due to the departure of the UK from the EU on 31st January 2020. From that date the provisions in The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 will apply (see <https://www.legislation.gov.uk/ukxi/2019/579/contents/made>). Existing protection for habitats and species including standards and assessment procedures will remain as they have been prior to the UK leaving the EU.
- 2.4 The 2017 Regulations and The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 should be read together until further clarification or changes are made available by the UK Government or legal case law.

- 2.5 All European Protected Species (EPS; great crested newts, bats, otter, white-clawed crayfish, hazel dormice, etc.) are protected under the 2017 Regulations and the WCA 1981. It is an offence under section 41 of the 2017 Regulations to:
- deliberately capture, injure or kill any wild animal of a EPS;
 - deliberately disturb a EPS (including in particular any disturbance which is likely to impair their ability to survive, breed or reproduce, rear or nurture their young; or to hibernate or migrate; or which affects significantly the local distribution or abundance of the species);
 - deliberately take or destroy the eggs of a EPS;
 - damage or destroy a breeding site or resting place of a EPS; or,
 - possess, control, transport, sell or exchange, or offer for sale or exchange, any live or dead wild animal of a EPS, or any part of, or anything derived from a EPS.
- 2.6 Section 9(4) (b) and (c) of the WCA 1981 makes it an offence to:
- intentionally or recklessly disturb a EPS while it is occupying a structure or place which it uses for shelter or protection; or,
 - intentionally or recklessly obstruct access to any structure or place which any EPS uses for shelter or protection.
- 2.7 In order for otherwise illegal acts to proceed lawfully, an appropriate licence must be sought under the 2017 Regulations and WCA 1981. Licences for the purpose of development are currently determined by Natural England and must include an appropriate mitigation and monitoring scheme to secure the “favourable conservation status” of the species in the local area.

Widespread Species of Reptile

- 2.8 Widespread species of reptiles (grass snakes, adder, slow worm and common lizard) are protected under the WCA 1981. These species receive partial protection under Section 9(1) and section 9(5). It is an offence to:
- intentionally kill or injure a common species of reptile; or
 - sell, or attempt to sell a live or dead reptile or any part of or anything derived from it.

Badgers

- 2.9 Badgers are protected under the Protection of Badgers Act 1992 (PBA 1992). It is an offence (except as permitted by or under the PBA 1992) to:
- wilfully kill, injure or take a badger or to attempt to do so;
 - cruelly ill-treat a badger;
 - intentionally or recklessly interfere with a badger sett by damaging or destroying a badger sett or any part of it or obstructing access to, or any entrance of, a

badger sett; causing a dog to enter a badger sett; or disturbing a badger when it is occupying a badger sett;

- possess or have control of a dead badger or a part of or anything derived from a badger; or,
- sell or offer for sale a live badger or to possess or have control of a live badger.

Non-native Species

- 2.10 It is an offence, under section 14, to release or allow to escape into the wild any animal listed on Schedule 9 Part I of the WCA 1981; this includes edible dormice *Glis glis*.
- 2.11 It is an offence, under section 14, to grow, or cause to grow in the wild any plant listed on Schedule 9 Part II of the WCA 1981.
- 2.12 Section 11 of the WCA 1981 prohibits the use of traps for those wild animals listed on Schedule 6 without a licence. The list includes Gliridae, the dormouse family, which includes edible dormice.

Wild Birds

- 2.13 Wild birds are protected under the WCA 1981. The basic principle of the Act is that all wild birds, their nests and eggs are protected by law and some rarer species are afforded special protection. Wild birds are defined as those resident in or visitors to Great Britain, in a wild state (does not include poultry or game bird). Section 1(1) of the WCA 1981 states that it is an offence to intentionally or recklessly:
- kill, injure or take any wild bird;
 - take, damage or destroy the nest of any wild bird while that nest is in use or being built; or
 - take or destroy an egg of any wild bird.
- 2.14 Section 1(2) of the WCA 1981 states that it is an offence to possess or control any live or dead wild bird or any part of or anything derived from a wild bird or an egg or part of an egg of a wild bird.
- 2.15 It is an offence under section 1(5) of the WCA 1981 to intentionally or recklessly:
- disturb any wild bird included in schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or,
 - disturb dependent young of such a bird.

3. Planning

- 3.1 The local planning authority has the power to request information under Article 4 of the Town and Country (Planning Applications) Regulations 1988 (SI1988.1812) (S3) which covers general information for full applications.
- 3.2 The National Planning Policy Framework (NPPF) revised in 2019 requires the planning system and policies to balance economic, social and environmental factors of sustainable development. The environmental component of the NPPF states that any planning application must: *'contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy'*. Chapter 15 (Conserving and Protecting the Natural Environment) includes the methods by which this is to be achieved, including:
- protecting and enhancing valued landscapes, sites of biodiversity or geological value;
 - recognising the intrinsic character and beauty of the countryside; and,
 - minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures.
- 3.3 Planning permission should be refused if: significant harm from a development cannot be adequately avoided, adequately mitigated, or as a last resort compensated for. The presumption in favour of development does not apply where development requiring appropriate assessment under the Habitats Directive is being considered, planned or determined. Planning policies and decisions should limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscape and nature conservation. Please see updated Planning Practice Guidance <https://www.gov.uk/government/speeches/local-planning>.
- 3.4 Section 99 of ODPM Circular 06/2005 states: 'It is essential that the presence or otherwise of protected species, and the extent that they may be affected by the proposed development, is established before the planning permission is granted, otherwise all relevant material considerations may not have been addressed in making the decision. The need to ensure ecological surveys are carried out should therefore only be left to coverage under planning conditions in exceptional circumstances, with the result that the surveys are carried out after planning permission has been granted. However, bearing in mind the delay and cost that may be involved, developers should not be required to undertake surveys for protected species unless there is a reasonable likelihood of the species being present and

affected by development. Where this is the case, the survey should be completed and any necessary measures to protect the species should be in place, through conditions and/ or planning obligations, before permission is granted'.

- 3.5 Local authorities have a duty to consider the three derogation 'tests' of the Habitats Directive: no satisfactory alternative, imperative reasons of overriding public interest (including those of a social or economic nature or beneficial consequences for the environment) and that the favourable conservation status of the species will be maintained. If any of these requirements are not met, the local authority should refuse planning permission regardless of any commitment to obtain a Natural England licence.

4. Methodology

Desk Study

- 4.1 A 1km data search was commissioned from Buckinghamshire and Milton Keynes Environmental Records Centre (BMERC) for records of protected and notable species, non-statutory designated sites, and priority habitats.
- 4.2 A 1km search of MAGIC Map (magic.defra.gov.uk) for statutory sites, priority habitats, European Protected Species Licenses (EPSLs), great crested newt class license returns and environmental DNA (eDNA) results for pond surveys undertaken by DEFRA 2017-2019 was undertaken by Bernwood Ecology. It should be noted that the MAGIC database was last updated in May 2019, therefore licences granted after that time will not yet be uploaded into the database.

Habitat Suitability Index for Great Crested Newt

- 4.3 The Habitat Suitability Index (HSI) for the great crested newt was developed by Oldham et al. (2000) as a method for estimating a waterbody's suitability for supporting the species. The HSI incorporates ten suitability indices, all of which are factors considered to be important in affecting the likelihood of great crested newts being present.
- 4.4 Ponds within the survey boundary were subject to HSI scoring.

Preliminary Ecological Appraisal

- 4.5 The purpose of the PEA is to establish the presence or potential presence of protected species and habitats on or near the site (zones of influence), and specifically:
- identify likely ecological constraints associated with the proposals;
 - identify any mitigation measures likely to be required, following the 'mitigation hierarchy';

- identify any additional surveys which may be required to inform a full ecological assessment; and,
- identify opportunities offered by a project to deliver ecological enhancements (CIEEM, 2017).

4.6 Habitats on site are assessed and mapped following the JNCC Phase I Habitat Survey methodology (JNCC, 2010). The survey was undertaken by J. Sowden, MSc. ACIEEM on 14th July 2021, adhering to good practice guidelines (CIEEM, 2017) and industry standard (BSI, 2013). Weather at the time of the survey was warm (21°C), with a light wind and hazy cloud cover.

Preliminary Roost Assessment

4.7 The objective of the PRA is to undertake a daytime inspection of the structure to assess whether there are actual or potential bat roosts present by searching for evidence of bat use and assessing the suitability of the structure to support bat roosts. If evidence of bats is found, the assessment searches for evidence to indicate:

- which species are present;
- an indicative roost size;
- roost access point(s);
- the roost type(s); and,
- whether further survey effort is required in relation to the proposals.

4.8 The PRA was carried out by J. Sowden (bat survey class licence level 2 surveyor: 2016-24351-CLS-CLS) on the same date as the PEA following the Bat Conservation Trust (BCT) Good Practice Guidelines (Collins, 2016). The buildings within the site boundary were systematically searched internally and externally for evidence indicating the presence of bats (live and dead bats, staining at potential roost entry points, feeding remains, droppings and urine marks) and assessed for suitability to support bat roosts through the identification of potential roosting features and potential bat access points.

4.9 Equipment available for use during the PRA included ladders, high-powered torches, binoculars, endoscope, digital camera, and sample jars (for collecting droppings for subsequent DNA analysis if required).

Biosafety and Biosecurity

4.10 All fieldwork is undertaken in line with the current government and professional (CIEEM, BSI, BCT, IUCN, etc.) COVID-19 guidelines at the time, maintaining physical distancing between surveyors, clients, and members of the public as appropriate.

- 4.11 Hygiene and biosecurity measures set out with Bernwood Ecology's COVID-19 Risk Plan are strictly adhered to, including regular thorough handwashing where possible and, where not, regular use of an appropriate viricidal hand sanitiser.

Scientific Consultation

- 4.12 In agreement with Conservation Evidence, Bernwood Ecology, as Evidence Champions, will:
- ensure that, where possible, the mitigation work is designed around a scientifically testable approach, observing the Conservation Evidence approach to critical assessment, study design, analysis and reporting;
 - build into project planning processes and reports a requirement for ecologists to check the Conservation Evidence website for relevant evidence, and describe the findings in the report; and,
 - where possible, publish results reporting on any tests of conservation interventions whether successful or otherwise in agreement with the client in the Conservation Evidence journal and other peer-reviewed journals.

5. Constraints and Limitations

Historical Records

- 5.1 Environmental records can provide an indication of the likely presence of a species on, or within proximity, to the site. The absence of records for protected species and sites does not necessarily indicate absence. The use of historical environmental records is not a substitute for appropriate surveys at the correct time of year when informing land use change and development proposals.
- 5.2 Qualifications for historical records, e.g., if a badger record is of a road casualty or of a sett, may not always be known.
- 5.3 Data search accuracy is variable and will often range from 10km to 1m. Most commonly, accuracy will be within 10m. The original raw data from data searches should be consulted where the record accuracy is needed.

Safe Access

- 5.4 Part or all the site may be considered to be inaccessible following an assessment of risk and therefore the survey may be constrained. Risks that may limit the survey effort include structurally unsafe structure(s) (including roof joists), confined spaces and dangerous egress and ingress points, asbestos, sharps, livestock, and hostilities from members of the public. Details of any access constraints are provided within the results of the report.

Digital Mapping

- 5.5 Every effort is made to ensure mapping accuracy; however, the exact locations of features should not be relied upon.

Mobile Species

- 5.6 Bats are a highly mobile species and move throughout a landscape often using multiple roost sites (depending on the species). Bats may be found in any suitable roosting cavity or void at any time of the year.

6. Results

Desk Study

- 6.1 The site is within the Chilterns Area of Outstanding Natural Beauty (AONB). There are no other statutory designations within 1km of the site boundary. There are four non-statutory sites within the search area, along with several records for priority habitats. A summary of relevant designated sites and priority habitats is included in Table 1 (public data search results available upon request).
- 6.2 A summary of relevant historical species records is included in Table 2 (public data search results available upon request).
- 6.3 The MAGIC Map Licensing Layer returned one record of a granted EPSL within 1km of the site: license EPSM2011-3213 was granted in 2011 for the destruction of a resting place of common pipistrelle *Pipistrellus pipistrellus* and brown long-eared *Plecotus auritus* bats, located approximately 900m to the north west of the site.
- 6.4 The MAGIC Map search returned no records for great crested newt from DEFRA's eDNA surveys or class license returns.

Table 1. Summary of relevant designated site records and priority habitats. Obtained from BMERC and MAGIC Map.

Abbreviations: AONB: Outstanding Natural Beauty. LWS: Local Wildlife Site. BNS: Biological Notification Site. ASNW: Ancient Semi-Natural Woodland

Site name	Designation	Approx. distance from the site (at closest point)	Details
<u>Statutory Sites</u>			
Chilterns	AONB	Sited within	Important diversity of habitats including chalk grassland and ancient beech woodland
<u>Non-Statutory Sites</u>			
Bottom Wood- 79X05	LWS/ BNS	530m	Lowland beech and yew woodland
Rivenoak Farm- 79Y15	LWS	660m	Lowland calcareous grassland
Pophley's Wood- 79T02	LWS/ BNS	820m	Lowland beech and yew woodland
Third's Wood- 79X03	LWS	980m	Ancient beech woodland on acid plateau
<u>Priority Habitats</u>			
Traditional orchard	-	Within site boundary	One area within site boundary with another four within 1km of site boundary
ASNW	-	460m	Nine areas within 1km
Deciduous woodland	-	100m	12 areas within 1km
Lowland beech and yew woodland	-	520m	Two areas within 1km
Lowland calcareous woodland	-	660m	One area within 1km

Table 2. Summary of relevant protected species records. Obtained from BMERC.

Abbreviations: WCA Sch1.1: Wildlife and Countryside Act 1981 Schedule 1 part 1. WCA Sch5: Wildlife and Countryside Act 1981 Schedule 5 (applicable section of legislation stated). WCA Sch8: Wildlife and Countryside Act 1981 Schedule 8. WCA Sch9: Wildlife and Countryside Act 1981 Schedule 9. PBA: Protection of Badgers Act 1992. EPS: European Protected Species.

Species	Highest designation	Year of most recent record	Approx. distance from the site	Details
<u>Plants</u>				
Bluebell <i>Hyacinthoides non-scripta</i>	WCA Sch8	2018	400m	Four records within 1km
<u>Amphibians</u>				
Great crested newt <i>Triturus cristatus</i>	EPS	2000	<1.5km	One record for vague tetrad
<u>Invertebrates</u>				
Small blue <i>Cupido minimus</i>	WCA Sch5 s9.5	2013	160m	Eleven records
Chalk hill blue <i>Polyommatus coridon</i>	WCA Sch5 s9.5	2017	280m	Three records
White-letter hairstreak <i>Satyrrium w-album</i>	WCA Sch5 s9.5	2004	700m	Three records
<u>Non-Flying Mammals</u>				
Badger <i>Meles meles</i>	PBA	2009	<1km	Three records
Hazel dormouse <i>Muscardinus avellanarius</i>	EPS	2009	800m	82 records
Edible dormouse <i>Glis glis</i>	WCA Sch9	2011	800m	Two records

Table 2. Continued.

Species	Highest designation	Year of most recent record	Approx. distance from the site	Details
<u>Bats</u>				
Common pipistrelle <i>Pipistrellus pipistrellus</i>	EPS	2009	150m	Two records
<u>Birds</u>				
Red kite <i>Milvus milvus</i>	WCA Sch1.1	2018	780m	25 records
Firecrest <i>Turdus ignacapilla</i>	WCA Sch1.1	2015	780m	One record

Habitat Suitability Index for Great Crested Newt

- 6.5 There are two ponds within the site boundary which were subject to HSI assessment (Appendix 2). A swimming pool is also present but actively used and heavily chlorinated so it has been discounted as unsuitable for use by amphibians.
- 6.6 Pond 1 is a small ornamental pond containing very little water (<50mm depth) and large pebbles along with ornamental vegetation. Pond 1 has a HSI score of 0.4 which equates to 'Poor' suitability.
- 6.7 Pond 2 is a concrete-lined pond adjacent to a chicken coop. The pond is up to 200mm deep and has a silty bottom. Pond 2 has a HSI score of 0.51 which equates to 'Below Average' suitability.

Preliminary Ecological Appraisal

- 6.8 The site is located within a rural landscape of the Chilterns with the village of Radnage to the north, east and south and farmland to the west and north west. The site is well connected to the wider landscape by hedgerows linking into small pockets of woodland nearby. The nearest substantial river is located over 3.5km to the south east (River Wye).
- 6.9 The site is approximately 0.72ha in size, and primarily consists of a large house along with several outbuildings, a garden with lawn and ornamental planting along with a small grass field to the south. Habitats are described in greater detail in Table 3 below and mapped in Appendix 3. Photographs are provided.

Table 3. Habitat descriptions.

Habitat	Description
Amenity Grassland	Grassland forms the majority of the garden. It is a uniformly closely-mown and well-kept lawn (Figure 1). Principal grass species are perennial ryegrass <i>Lolium perenne</i> and red fescue <i>Festuca rubra</i> , with occasional bent-grass <i>Agrostis</i> sp. The herb assemblage is species-poor with the most abundant species being white clover <i>Trifolium alba</i> with dandelion <i>Taraxacum</i> agg, cat's-ear <i>Hypochaeris radicata</i> , self-heal <i>Prunella vulgaris</i> and daisy <i>Bellis perennis</i> also being noted.
Buildings	There are six buildings within the site boundary which are described in detail in the PRA section below.
Semi-Improved Grassland	A narrow strip of grassland is present along the south western boundary of the site which is noticeably different in form and species composition to the amenity grassland lawn (Figure 2). The sward is generally long (>400mm) though not particularly tussocky, indicating that it is mown irregularly. There is a moderate diversity of grass species with the sward principally comprised of bent-grass, false oat grass <i>Arrhenatherum elatius</i> and Yorkshire fog <i>Holcus lanatus</i> ; other grass species present to a lesser degree include sweet vernal grass <i>Anthoxanthum odoratum</i> , smaller cat's-tail <i>Phleum bertolonii</i> and perennial ryegrass. The grassland has a moderate diversity of herb species including abundant bird's-foot trefoil <i>Lotus corniculatus</i> with black medick <i>Medicago lupulina</i> , yarrow <i>Achillea millefolium</i> , white clover, self-heal, cat's-ear, vetch <i>Vicus</i> sp. and ragwort <i>Senecio jacobaea</i> also present. To the north of the hedgerow HR2, there is a narrow strip which appears to have been seeded with a wildflower mix comprising native and non-native species, including cornflower <i>Centaurea cyanus</i> , poppy <i>Papaver</i> sp. and foxglove <i>Digitalis purpureum</i> (Figure 3).
Hardstanding	Hardstanding in the form of a compacted gravel driveway, paving slabs, steps and poured concrete pathways, is present around much of the main dwelling (Figures 4 & 5). It is mostly in good condition.
Ornamental Shrub	Landscaping within the garden includes well-developed areas of taller plants and shrub species (Figure 6). The areas are variable, containing a mixture of planted native plants such as yew <i>Taxus baccatus</i> and common box <i>Buxus sempervivens</i> but also many non-native species including rhododendron <i>Rhododendron</i> sp., wisteria <i>Wisteria</i> sp., cherry laurel <i>Prunus laurocerasus</i> , lilac <i>Syringa</i> sp. and lavender <i>Lavendula</i> sp.
Other Habitat- Flowerbed	There are several flowerbeds within the garden containing ornamental plants and vegetables (Figure 7). Generally well-kept, species here include ornamental grasses, begonias <i>Begonia</i> sp., honeysuckle <i>Lonicera</i> sp. and ferns.

Table 3. Continued.

Habitat	Description
Standing Water	Three waterbodies are present within the site boundary: a swimming pool (Figure 8), a small ornamental pond (P1) (Figure 9) and a concrete-lined pond nearby (P2) (Figure 10). P1 measures approximately 1x1m and is filled with small pebbles; the water depth is <50mm and plants include soft rush <i>Juncus effusus</i> and water mint <i>Mentha aquatica</i> . P2 is adjacent to a chicken coop and its relatively murky water is likely to be somewhat polluted from the runoff of nutrients. The base of the pond is concrete with large boulders set around the edge. The water appears to be approximately 300mm deep with a thick sediment layer. Plants present include soft rush, sedges <i>Carex</i> sp. and iris <i>Iris</i> sp.
Bare Ground	A chicken coop is present in the western corner of the site. The ground here is bare, compacted bare earth from the chickens.
Hedgerow- Intact Species-Rich	The hedgerow along the south eastern site boundary (HR1) is approximately 1.8m high and 1m wide (Figure 11). The species composition is dominated by hawthorn <i>Crataegus monogyna</i> , with other species present including hazel <i>Corylus avellana</i> , beech <i>Fagus sylvatica</i> , ash <i>Fraxinus excelsior</i> , elder <i>Sambucus nigra</i> , holly <i>Ilex aquifolium</i> and rose <i>Rosa</i> sp. It appears to be fairly well-managed, with signs of pruning.
Hedgerow- Intact Species-Poor	There are several species-poor hedges within and around the site boundary: <ul style="list-style-type: none"> - HR2: Dominated by hazel with occasional holly (Figure 12). Fairly immature and approximately 1.5m tall and 1m wide. - HR3: Dominated by hazel with hawthorn, elder and elm <i>Ulmus minor</i> also present (Figure 13), up to 3m tall and 2m wide. - HR5: Mixture of ornamental and native species. Frequent holly with yew, cherry laurel, and various conifers (Figure 14). Up to 8m tall and 3m wide. - HR6: Mixture of ornamental and native species (Figure 15). Frequent Leyland's cypress <i>Cupressus x Leylandii</i> with occasional common box, beech and hawthorn. Up to 12m tall and 3m wide.
Hedgerow with Trees - Intact Species-Poor	HR4 forms part of the southern boundary of the site and principally consists of semi-mature lime <i>Tilia</i> sp. trees, with hazel, elder and hawthorn also present (Figure 16).

Table 3. Continued.

Habitat	Description
Scattered Mature Trees	Several mature trees are present within the garden, some likely to be remnants of the orchard historically present on site (Figure 17). Species include apple <i>Malus</i> sp., cherry, pear <i>Pyrus</i> sp. and walnut <i>Juglans</i> sp. Trees with bat use potential are described in more detail in the PRA section below.



Figure 1. Amenity grassland.



Figure 2. Semi-improved grassland.



Figure 3. Wildflowers on northern side of HR2.



Figure 4. Hardstanding driveway.



Figure 5. Hardstanding paving around swimming pool.



Figure 6. Ornamental shrub habitat.



Figure 7. Flowerbeds surrounding main property.



Figure 8. Swimming pool.



Figure 9. Small ornamental pond P1.



Figure 10. Concrete-line pond (P2).



Figure 11. HR1.



Figure 12. HR2.



Figure 13. HR3.



Figure 14. HR5.



Figure 15. HR6.



Figure 16. HR4.



Figure 17. Mature cherry (foreground with mature apples in background).

Preliminary Roost Assessment

- 6.10 There are six buildings within the site boundary. They are described in Table 4 below.
- 6.11 A summary plan of the findings of the PRA can be found in Appendix 6.
- 6.12 There are several mature trees within the site boundary. Two have the potential to support roosting bats. An apple tree to the south east of B6 (TN1) has 'Moderate' potential under the BCT Good Practice Guidelines (Collins, 2016) due to the presence of several woodpecker holes. Another apple tree farther to the south of this (TN2) has 'Low' potential to support roosting bats due to the presence of rot holes.

Table 4. Building inspection summary

Building Number	Description	Bat Roosting Potential
1	<p>B1 is the existing residential property at the site (Figures 18-34). It is a large two-storey house, of which some appears to date from the early 20th century; there have been several extensions and modifications to the building and roof. The walls are predominantly constructed from brick with some areas of flint noted; it was not possible to determine if a cavity is present within the wall, but it is likely to in some areas. The window and door frames are generally modern and of uPVC material; they are in good condition with no obvious gaps noted.</p> <p>The roof is complex, with hipped and flat roof sections as well as several dormers. The roof is covered with a combination of cement and machine-made clay tiles generally in good condition, though gaps and missing mortar were noted around slipped/ broken tiles and around the ridge and hip tiles, respectively (Figure 24). These gaps may provide suitable roosting opportunities for crevice-dwelling bats such as pipistrelles or could provide access into the loft voids. Some hanging tiles are present on the south-facing dormers. There are several chimneys on the property and gaps were noted in the roof structure around these areas along with lifted lead flashing and loose tiles (Figure 25). There are painted wooden/ asbestos soffit boxes around the eaves of the building which appeared to be in good condition. Due to the complex nature of the roof, not all features were visible from the ground.</p> <p>Internally, B1 has two main loft voids. The western loft void (loft void 1) covers much of the hipped sections of roof on the western side of the property (Figures 26-31). The loft was hot (29°C) with little in the way of noticeable air movement. It has rockwool insulation between the joists and is partially boarded. Square-sawn wooden beams support the roof structure, with rafters, trusses, a narrow ridge board and joists visible. The roof is lined with bituminous felt which has some holes, exposing the underside of the roof tiles. Scattered droppings consistent in size and shape with brown long-eared bat were observed across the entire loft void (sample taken), with some slight concentrations under the ridge board (50-150 droppings in total). No large piles to indicate large numbers of bats were found however the amount of droppings indicate use by low numbers of bats (but not maternity). A single brown long-eared bat was observed roosting at the far western end of the loft void where the rafters and hip beams meet the ridge board; this bat was determined to be an adult male in breeding condition. The ridge beam and loft void in generally was free from cobwebs. Potential entry/ exit points for bats to enter the western loft void include gaps around the chimney and holes in the bitumen felt lining. Some light enters at eaves' level although it was not possible to determine where the gaps were due to access restrictions.</p>	<p>Confirmed brown long-eared roost in both loft voids.</p> <p>Potential for other bat species to roost under ridge tiles, slipped/ broken roof tiles.</p>

Table 4. Continued.

Building Number	Description	Bat Roosting Potential
1 (cont.)	The eastern loft void (loft void 2) encompasses most of the eastern half of the building including the flat-roof section in the centre of the building (Figures 32-34). The loft structure is broadly similar to the western void in insulation, square-sawn timber beams and bitumen felt lining. The loft was hot (28°C) with no obvious air movement. Widely scattered bat droppings consistent with brown long-eared were present throughout the void, though there were no discernible concentrations (sample taken). The ridge beams were lightly covered with cobwebs. There were no obvious access points for bats although some light was visible at the eaves. Rat and mouse droppings were noted, particularly under the flat-roof section.	
2	B2 is a modern conservatory building constructed from glass and a metal frame used to store furniture and swimming pool equipment (Figure 35). It has no features suitable for roosting bats.	Negligible
3	B3 is a very small outbuilding used for the swimming pool pump (Figures 36 & 37). It is constructed from brick with a wooden door and doorframe. It has a pitched roof with machine-made clay tiles which are all in good condition and free of gaps suitable for use by roosting bats. Internally, there is a bitumen felt underlay beneath the roof tiles. Large gaps at the eaves allow light to enter and the inside of the building is well-lit and subject to air movement from these features. There is no evidence of roosting bats present.	Negligible
4	B4 is a large shed used for storage (Figures 38-43). The walls are constructed from concrete blocks and some wooden cladding on the northern aspect has some gaps suitable for use by roosting bats. There are wood window and doorframes. The windows have broken glass in places which may provide suitable access points for bats into the building. The windows allow a large amount of light to enter the building, reducing the building's suitability to support roosting bats. The roof is hipped and covered with slate tiles in good condition, but some gaps are present around the hip tiles and ridgeline. There are wooden/ asbestos soffit boxes at the eaves with some gaps noted along the eastern aspect. Internally, the building is well-lit. The square-sawn timber beams are exposed along with the bitumen felt roof underlay. No evidence of roosting bats was observed.	Low

Table 4. Continued.

Building Number	Description	Bat Roosting Potential
5	<p>B5 is a traditional wooden-framed barn currently used as a garage and for storage (Figures 44-50). It is difficult to determine the age of the building as most of the roofing timbers and walls appear to be fairly recent (20th century), however, there are older truss beams (likely 19th century) that may be original or could have been re-purposed. The walls are single-skin wood panelling with numerous gaps. They are open on the south western and part of the north western aspects, allowing a large amount of light and air movement to enter. Wooden doors with large gaps above and below are present on the north eastern aspect, and there is a small plastic window on the north western aspect.</p> <p>The roof is pitched on the north east - south west axis with a shallow sloped section at the southern half of the building. The pitched section has wooden sarking with a slate tile covering; the slates appear to be tight to the sarking board with gaps suitable for use by bats noted near to the gable ends and along the ridge line. The sloped section has wooden sarking overlaid with close-fitting bitumen roofing felt with no obvious gaps suitable for bats.</p> <p>Internally B5 has high light levels and noticeable air movement at the time of survey, reducing the suitability for use by day-roosting bats. The complex wooden beam structure is exposed, along with the underside of the wooden sarking. Generally, the beams appear to be tight-fitting with no obvious gaps suitable for use by crevice-dwelling bats recorded, nevertheless the presence of such gaps, particularly higher in the roof structure cannot be discounted. There are numerous potential entry/ exit points for bats through the open walls, gaps within the walls and potentially through roof tiles. No evidence of bats was found during this PRA; however, a subsequent site walkover by Dr. Stacey Waring, ACIEEM, of Eaves Ecology on 26th July 2021, found evidence of bat use in the form of droppings (consistent in size and shape with brown long-eared bat) and moth wing feeding remains, indicating that the building is likely being used as a feeding perch or night roost; planned night time roost surveys will confirm the situation with regards to this.</p>	Confirmed bat roost

Table 4. Continued.

Building Number	Description	Bat Roosting Potential
6	<p>B6 is a modern stable located in the western corner of the site. The external walls are constructed from concrete blocks with wooden panel cladding on the exterior. The south western aspect of the building is open, allowing a large amount of light to enter. The roof is pitched with slate tiles on top of a plastic underlay; the tiles are in good condition with no obvious gaps suitable for use by bats. There are wooden bargeboards at the gable ends of the building, with gaps noted along the south eastern gable at the verges which may be suitable for roosting or accessing cavities within the building structure.</p> <p>Internally, B6 is well-lit and subject to air movement. The interior side of the breezeblock walls, wooden panelling and beam structure is exposed. The timber beams are all square-cut and modern with no obvious gaps suitable for use by crevice-dwelling bats, especially considering the high ambient light levels. No evidence of use by bats was observed.</p>	Low



Figure 18. B1, southern end of south western aspect.



Figure 19. B1, centre of south western aspect.



Figure 20. B1, north eastern corner.



Figure 21. B1, north eastern aspect.



Figure 22. B1, north eastern aspect, central area.



Figure 23. B1, north eastern aspect, eastern area.



Figure 24. B1, gaps around ridge tiles.



Figure 25. B1, lifted lead flashing around central chimney.



Figure 26. B1, loft void 1.



Figure 27. B1, loft void 1.



Figure 28. B1, loft void 1. Note bat droppings at bottom of picture.



Figure 29. B1, loose aggregation of bat droppings under ridge beam.



Figure 30. B1, male brown long-eared bat roosting at north eastern end of loft void 1.



Figure 31. Close up of male brown long-eared bat roosting in loft void 1, B1.



Figure 32. Loft void 2, B1.



Figure 33. Flat roof section of loft void 2, B1.



Figure 34. Scattered bat droppings, loft void 2, B1.



Figure 35. B2, conservatory.



Figure 36. B3, exterior.



Figure 37. B3, interior showing open eaves.



Figure 38. B4, north western aspect.



Figure 39. B4, south eastern aspect.



Figure 40. B4, northern aspect. Note wooden cladding with gap at base.



Figure 41. Broken window on south eastern aspect.



Figure 42. Interior of B4.



Figure 43. Interior roof structure of B4.



Figure 44. North western aspect of B5.



Figure 45. South western aspect of B5.



Figure 46. Northern corner of B5.



Figure 47. B5, gaps in mortaring of ridge tiles.



Figure 48. Interior of B5.



Figure 49. Interior of B5 showing wooden beam with shallow gaps on underside.



Figure 50. Interior of B5 showing north eastern gable wall.



Figure 51. B6, eastern corner.



Figure 52. B6, south western aspect.



Figure 53. B6, southern corner.



Figure 54. Interior of B6, north western gable end.



Figure 55. Interior of B6 showing plastic roof underlay and beam structure.

7. Discussion and Conclusions

Designated Sites

- 7.1 The site is located within the Chilterns AONB, and there are no other statutory sites within 1km of the area surveyed. There are several non-statutory sites within 1km of the site, the closest being >500m. The potential for direct adverse effects is therefore negligible. As the proposals are small-scale and unlikely to result in a significant increase in residents at the site, there will be no increase in recreational pressure upon nearby designated sites.
- 7.2 MAGIC Map and the data search for BMERC identified several different priority habitats within 1km of the site, including an area of traditional orchard within the site boundary. Historic mapping shows the continued presence of an orchard at the site from at least 1881 and the fruit trees present are likely to be a relic of this historically present orchard. Today, there are fewer than 15 mature fruit trees present within the site boundary, the area has been a well managed garden for some time and is no longer considered to be a traditional orchard priority habitat.
- 7.3 At this stage, it is unclear whether the proposals are likely to impact the fruit trees or the area in which the orchard was historically present. If the trees or area are to be affected, then further assessment of the impacts is likely to be required. There is significant potential for the site to be enhanced for biodiversity, such as reinstating areas of orchard, as part of the proposals.

Habitats

- 7.4 Habitats within the site boundary range from having low ecological value (hardstanding, introduced shrub, flowerbeds, amenity grassland) to moderate ecological value (semi-improved grassland, hedgerows, mature trees). The proposals must avoid and minimise the loss of the habitats with moderate ecological value as part of their design. Any loss of mature trees or hedgerows must be compensated for to ensure that the proposals do not result in a loss of biodiversity. There is significant potential to provide enhancements to the hedgerows and grassland.

Great Crested Newt

- 7.5 A single record for great crested newt was returned from the BMERC data search, a large tetrad centred over 1.5km from the site over 20 years ago. The two ponds within the site boundary are considered to be unsuitable for the species ('Poor' and 'Below Average'). Given the likely small scale of the proposals, the lack of local records for the species and that the ponds within the site boundary have low suitability for great crested newt, there is a negligible risk of great crested newt

being present on site or adversely affected by the proposals. Best practice measures are recommended to reduce the very low residual risk of harm to amphibians.

Reptiles

- 7.6 There are no records for reptiles within 1km of the site. Habitats within the site boundary are generally sub-optimal for reptile species and lack the structural diversity to provide suitable sheltering or hibernation habitat with the exception of the semi-improved grassland areas and hedgerows which do offer some limited potential to support reptiles. At this stage, it is unclear whether the proposals are likely to impact the more suitable habitats such as the semi-improved grassland and hedgerows. Assuming these habitats are to remain unaffected, best practice recommendations are made to ensure the risk of harming reptiles during works is minimised. Should the proposals require the removal of areas of semi-improved grassland and/ or hedges, a review of the risk must be undertaken by the project ecologist to ensure these recommendations are sufficient.

Terrestrial Mammals

- 7.7 There are several records for hazel dormouse within 1km of the site, all originating from Bottom Wood, approximately 500m to the south east of the site. There is some limited connectivity via hedgerows from Bottom Wood to the site, however the areas of open ground and Radnage Common Road are likely to present barriers to hazel dormouse movement. The hedges within and around the site boundary are generally lacking in the diversity of berry- and nut-bearing tree/ scrub species that could support hazel dormouse so it is likely that any use by the species will only be transitory. It is not clear whether any hedges will be affected by the proposals at this stage; if any hedges are to be affected then a precautionary Ecological Clerk of Works (ECoW) will be required for the works to reduce the risk of harm should the species be encountered.
- 7.8 No evidence of use of the site by badgers was found and it is therefore considered unlikely that the species will be affected by the works. General best practice measures are recommended to minimise the risk of harm to badgers and other wildlife.
- 7.9 The data search returned records for edible dormouse, a non-native invasive species listed in WCA 1981 Schedule 9. If this species is inadvertently captured during the works, it is an offence for it to be released back into the wild.

Bats

- 7.10 Some historical bat records were returned from the data search, and there are several areas of woodland in close proximity to the site connected by mature hedgerows and gardens, which increase the likelihood of bats being present on site. Buildings 1 and 5

are confirmed bat roosts and are likely to require a European Protected Species Licence (EPSL) to allow their modification (Building 1) or demolition (Building 5); further survey will be required to classify the roosts and inform any EPSL application. Buildings 4 and 6 have 'Low' potential to support roosting bats under the Bat Conservation Trust Good Practice Guidelines (Collins, 2016) and will require further survey to provide sufficient confidence in the absence of roosting bats (should they be affected by the proposals). Buildings 2 and 3 have 'Negligible' potential to support roosting bats and do not require further survey.

- 7.11 Two trees (TN1 and TN2) have 'Moderate' and 'Low' potential to support roosting bats respectively. If these trees are to be affected by the proposals, then further survey will be required to provide sufficient confidence in the absence of roosting bats.
- 7.12 Artificial light levels at the site appear to be low. The proposals must avoid additional artificial lighting unless absolutely necessary, with any additional lighting to be carefully designed to minimise light spill.

Wild Birds

- 7.13 Vegetation and buildings within the site boundary offer the potential to support nesting birds. Recommendations are made to time vegetation removal/ building works to avoid the months in which nesting birds are most likely to be present or to conduct pre-works nesting bird checks by a suitably experienced ecologist.

8. Recommendations

- 8.1 The ecological mitigation hierarchy must be followed by all elements of the project, from design, to construction, to end use, to ensure there is a net gain to biodiversity on site and the favourable conservation status of protected species is maintained. The mitigation hierarchy follows:
- *Avoid*: avoid impacts on biodiversity as a priority.
 - *Minimise*: minimise impacts that cannot be completely avoided, through alternations to design, use, scale, location, timing of phases, etc.
 - *Mitigate and compensate*: undertake works which will have an impact by implementing safeguarding measures, such as using an Ecological Clerk of Works (ECoW) where there are risks to wildlife. Provide compensation to replace habitats that have been lost as a consequence of proposals.
 - *Enhance*: Provide additional habitats and features for wildlife to ensure biodiversity net gain. Habitat offsetting may be required where net biodiversity gain cannot be secured within the site boundary.

Best Practice Measures

- 8.2 General measures are to be implemented to avoid the risk of harm to wildlife before and during the construction activities:
- During construction, excavations are to be backfilled or covered overnight or created with a shallow sloping side to allow any inadvertently captured wildlife to escape unaided.
 - No fires are to be lit on site.
 - No food is to be left on site overnight that may attract scavenging wildlife into the working area.
 - All litter is to be stored in suitable covered bins or taken home to reduce the likelihood of litter being distributed into the local area by the weather.
- 8.3 Where protected species are unexpectedly encountered on or near to the site, before or during construction, works are to cease, and the advice of a professional ecologist sought to allow a reassessment of impacts and appropriate advice to be given.

Habitat Retention and Enhancement

- 8.4 At this stage, the footprint of the works is not currently known. Habitats within the site boundary mostly have low ecological value and are common and widespread in the local landscape. The areas of semi-improved grassland, mature trees and hedgerows do have ecological value and should be retained and enhanced where possible as part of the proposals. The mature trees are to be protected by Root Protection Areas which are to be implemented in line with the tree in relation to design, demolition and construction (BSI, 2012). If the semi-improved grassland, mature trees or hedgerows are to be affected by the proposals, then measures will be required to ensure the loss is adequately compensated.
- 8.5 The mature trees within the site boundary are likely to be the relic of an orchard historically present at the site. It is not known if they will be affected by the proposals; if this is the case then a detailed orchard assessment will be required to assess the value of the habitats in order to fully assess the impacts. There is the potential to restore these areas to provide a significant enhancement to biodiversity.

Reptiles

- 8.6 It is recommended that the amenity grassland within the site boundary continues to be mown short in order to discourage any reptiles from colonising the site in the lead up to works commencing. If the longer areas of grass within the semi-improved areas are to be affected by the proposals, a two-stage cut prior to works commencing will be required to minimise the risk of harm to reptiles. The first cut should take the sward length down to 150mm and a second cut no less than 24 hours later will take the length to 50mm or less, after which works in the area can commence. Care must

be taken to ensure any debris is stored on areas of hardstanding or removed from site immediately to prevent colonisation by reptiles.

Non-Flying Mammals

- 8.7 Should any hedgerow be affected by the proposals, supervision of the works by a suitably experienced ecologist will be required to minimise the residual risk of harming hazel dormouse. If hazel dormouse or evidence of the species is found, then a review of the proposals by the project ecologist must be conducted; this may result in advice to seek an EPSL if impacts upon hazel dormouse cannot be avoided.

Bats

- 8.8 Works to the buildings which support bat roosts (Building 1 and Building 5) will require an EPSL to proceed lawfully. Three dusk or dawn emergence/ re-entry surveys will be required to classify the roosts and inform any EPSL application.
- 8.9 If Buildings 4 or 6 are to be affected by the proposals, then one dusk or dawn survey will be required to provide sufficient confidence in the absence of roosting bats. Should roosting bats be discovered, a further two surveys will be required to inform an EPSL application.
- 8.10 The bat surveys must be carried out in the optimal survey season (May to mid-September) following the BCT Good Practice Guidelines (Collins, 2016). Surveyors must be positioned to provide adequate coverage of the buildings.
- 8.11 There must be no additional lighting on site that will spill artificial light onto any known or created bat roosts or habitats of ecological value such as hedgerows, mature trees or adjacent properties. Published guidance on the use of lighting in relation to bats (Institute of Lighting Professionals and the Bat Conservation Trust 2018) should be used to guide any necessary lighting for health and safety purposes, such as:
- 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 <2700 Kelvin) should be adopted to reduce blue light component.
 - Any external security lighting should be set on motion-sensors and short (one-minute) timers.
 - Luminaires should feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2013).
 - Proposals for light fittings and designs are to include baffles, hoods or louvres to reduce light spill and direct it only to where it is needed.

- The planting of trees, bushes and hedges can be used to mitigate for impacts of artificial lighting through the creation of dark buffers.

Nesting Birds

- 8.12 To ensure that active nests are not damaged or destroyed during the construction activities, it is advised that any vegetation clearance and works on the buildings are started during the autumn or winter months (i.e., September-February) when birds are least likely to be nesting, subject to other protected species recommendations. Works undertaken outside of this period will require a nesting bird check to be conducted by a suitably experienced ecologist no more than 24 hours prior to works starting. If active nests are observed, activity within the vicinity must cease and an appropriate safe zone around the nest established until the young have been verified to have fully fledged by the ecologist and the nest is no longer active.

Age of Survey Data

- 8.13 It is accepted that ecological surveys have a limited period of validity due to changing habitats and the transient behaviours of some UK wildlife species. Delays on the progression of the project beyond 18 months will require the PEA and PRA to be repeated (CIEEM, 2019). As the proposals are currently in their draft stages, with the footprint not yet determined, a review should be conducted by the project ecologist of the final proposals.

9. References and Further Reading

BSI (2012). Trees in relation to design, demolition and construction—Recommendations (BS 5837:2012). British Standards Institution.

BSI (2013). Biodiversity—Code of practice for planning and development (BS 42020:2013). British Standards Institution.

CIEEM (2015). What to expect from a bat survey: A guide for UK homeowners. [online] http://www.cieem.net/data/files/Bat_Survey_Guidelines_for_UK_Home_Owners_2015.pdf

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

CIEEM (2019). Advice Note: on the lifespan of ecological reports & surveys. [online] <https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf>

Collins, J. (ed.) (2016). Bat surveys for professional ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

Institution of Lighting Professionals and Bat Conservation Trust (2018). Bats and artificial lighting in the UK. [online] <https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/>

JNCC (2008). UK Biodiversity Action Plan; Priority Habitat Descriptions. BRIG (ed. Ant Maddock)

Matthews, F., Kubasiewicz L. M., Gurnell J., Harrower C. A., McDonald R. A. and Shore R. F. (2018). A review of the population and conservation status of British mammals: technical summary. A report by the Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough.

Mitchell Jones, A. J. (2004). Bat mitigation guidelines. English Nature, Peterborough.

Natural England (2021). Protected species and site: How to review planning proposals. [online] <https://www.gov.uk/guidance/protected-species-and-sites-how-to-review-planning-proposals>

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

Oram S. and Wedge C. (2014). Traditional Orchard Condition Assessment (People's Trust for Endangered Species).

Stone, E. L. (2013). Bats and lighting: Overview of current evidence and mitigation.

Appendix 1. Site location in relation to existing landscape.



Appendix 2. Habitat Suitability Index for great crested newt results.

ARGUK GCN HSI Calculator				
Pond Name			Pond 1	Pond 2
Grid Ref			SU78889617	SU78849617
SI No	SI Description		SI Value	SI Value
1	Geographic location		1	1
2	Pond area		0.05	0.1
3	Pond permanence		0.1	0.9
4	Water quality		0.33	0.33
5	Shade		1	1
6	Water fowl effect		1	0.67
7	Fish presence		1	1
8	Pond Density		0.6	0.6
9	Terrestrial habitat		0.33	0.33
10	Macrophyte cover		0.3	0.3
HSI Score			0.40	0.51
Pond suitability (see below)				
Categorisation of HSI Score by Lee Brady				
HIS Score		Pond Suitability		
< 0.50		Poor		
0.50 - 0.59		Below average		
0.60 - 0.69		Average		
0.70 - 0.79		Good		
> 0.80		Excellent		
Based on ARGUK advice note 5 - Great Crested Newt Habitat Suitability Index				

Appendix 3. Habitats plan.



Appendix 4. Preliminary Roost Assessment summary plan.

