

WILD FRONTIER ECOLOGY

Laddus Farm, Upwell,
Cambridgeshire



Ecology Report

September 2022

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The data which we have prepared and provided is accurate, and has been prepared and provided in accordance with the CIEEM's Code of Professional Conduct. We confirm that any opinions expressed are our best and professional bona fide opinions.



This report conforms to the British Standard 42020:2013 Biodiversity - Code of practice for planning and development.

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1. Non-technical Summary

Wild Frontier Ecology Ltd. was commissioned to undertake an ecological assessment of a complex of barns at Laddus Farm near Upwell in Cambridgeshire. The proposal is to demolish one barn and convert two barns (and also extend one) for use as holiday lets.

A desk study was completed that included a data search and reviews of the MAGIC website, Ordnance Survey maps and aerial images. A site visit was undertaken on 27th June 2022 to complete an Extended Habitat Survey and building inspection. Two bat emergence surveys were subsequently carried out in July and August 2022. A badger trail camera survey was also undertaken in August 2022.

No impacts to statutory or non-statutory designated nature sites are expected as none are present within a 2 kilometre (km) radius of the site.

The building inspection found the complex to consist of four connected barns (referred to as barns 1-4). A bat roost was confirmed in barn 3 during the building inspection, as approximately 15 droppings were found underneath a niche in the roof apex at the north-eastern end of the barn. The areas around the barns comprise modified grassland, scrub and hardstanding; no significant changes to these habitats are anticipated as the proposal centres around conversion of the barns. Mammal burrows were found in barn 3, which were identified as potentially excavated by badgers with some evidence of rabbits also. A subsequent trail camera survey in August 2022 recorded no badgers currently using the entrance holes.

Bat emergence surveys conducted in July and August 2022 concluded that barn 2 supports a small maternity colony of common pipistrelle bats, with 10 individual bats recorded emerging from the southern gable end under the roof tiles. Barn 3 was found to support two day roosts observed being used by three bats including common and soprano pipistrelle. Barn 4 was found to support a feeding perch and day roost for a brown long-eared bat.

The proposed conversion of barns 2, 3 and 4 is expected to result in the loss of these bat roosts. A European Protected Species (EPS) mitigation licence is required to legally permit the proposed conversion of barns 2, 3 and 4.

Intermediate impacts to foraging bats are possible given the maternity colony on site and surrounding foraging habitats. Minor impacts to badger, breeding birds and Priority Species such as brown hare and hedgehog are also feasible. A full four weeks of trail camera monitoring of the mammal burrows is required immediately prior to their removal to avoid accidental harm to badgers or destruction of an active sett, both of which would be legal offences. A pre-commencement check of the barns for nesting birds is advised as well as limited and sensitive night-lighting of the site during construction and during occupation to limit impacts to foraging bats. Best practice construction measures are also advised to limit any potential impacts to terrestrial mammals which may pass through the site.

Enhancement advice is provided including the incorporation of two bird into the fabric of the converted barns and three bat boxes on surrounding trees. Should the enhancement advice be followed, net benefits to these species are predicted.

2. Background and Objectives

2.1 Background

Wild Frontier Ecology Ltd. (WFE) was commissioned by Anglia Building Consultants to undertake an ecological assessment of Laddus Farm, March Riverside, Upwell, Cambridgeshire, PE14 9AT (Figure 1, National Grid Reference: TF 4720 0087).

The proposal is to demolish one open-framed barn (barn 1) and convert two barns (barns 2 and 3) to holiday let usage. One of the two barns to be converted will also be extended (barn 2).

Planning permission for the conversion of an adjoining barn (barn 4) to an annexe (ancillary to the main dwelling) was granted by Fenland District Council on 10th November 2020 (planning reference: F/YR20/0863/F).

An aerial view and building plan of the site are shown in Figure 2 and the proposed site layout plan is shown in Figure 3. The proposed floor plan for the converted barn in the south-east (barn 3) is shown in Figure 4. The proposed floor plan for the barn in the north-west (barn 2) is shown in Figure 5.

Figure 1: Site Location

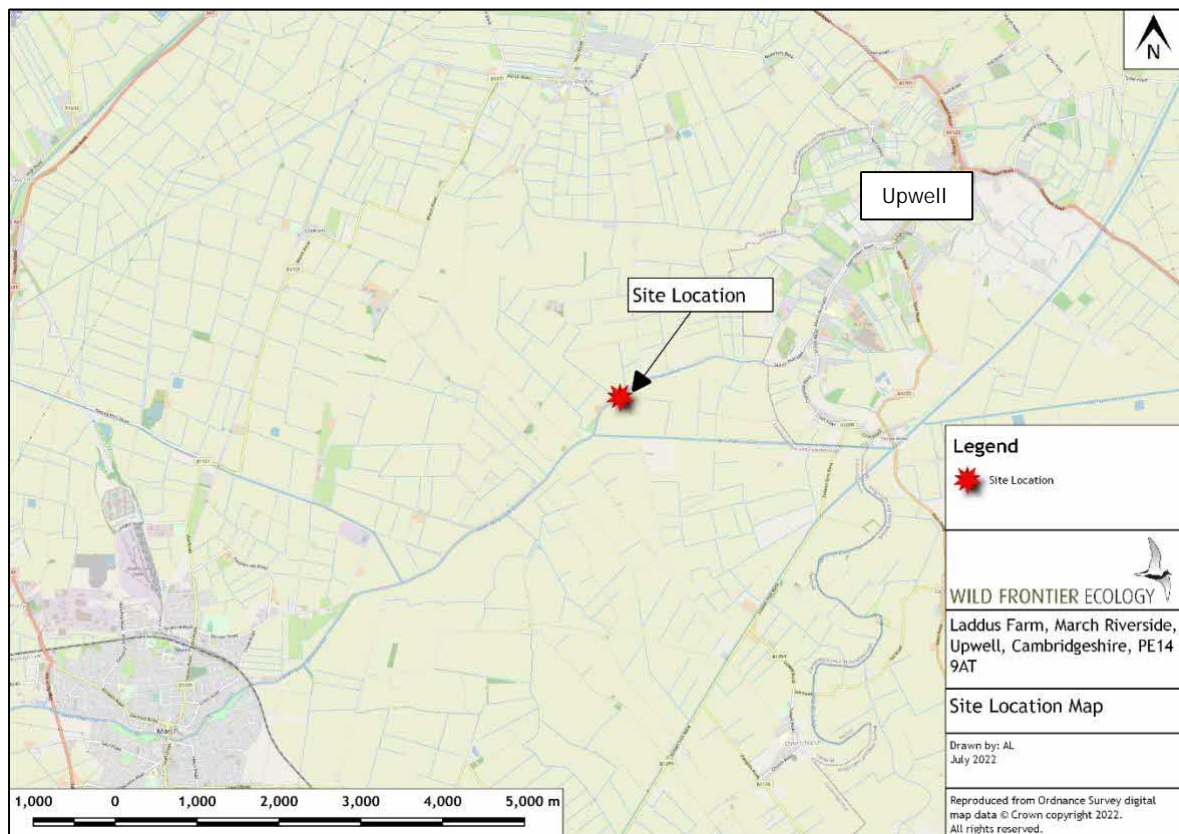




Figure 2: Existing Aerial View of Site and Floor Plan

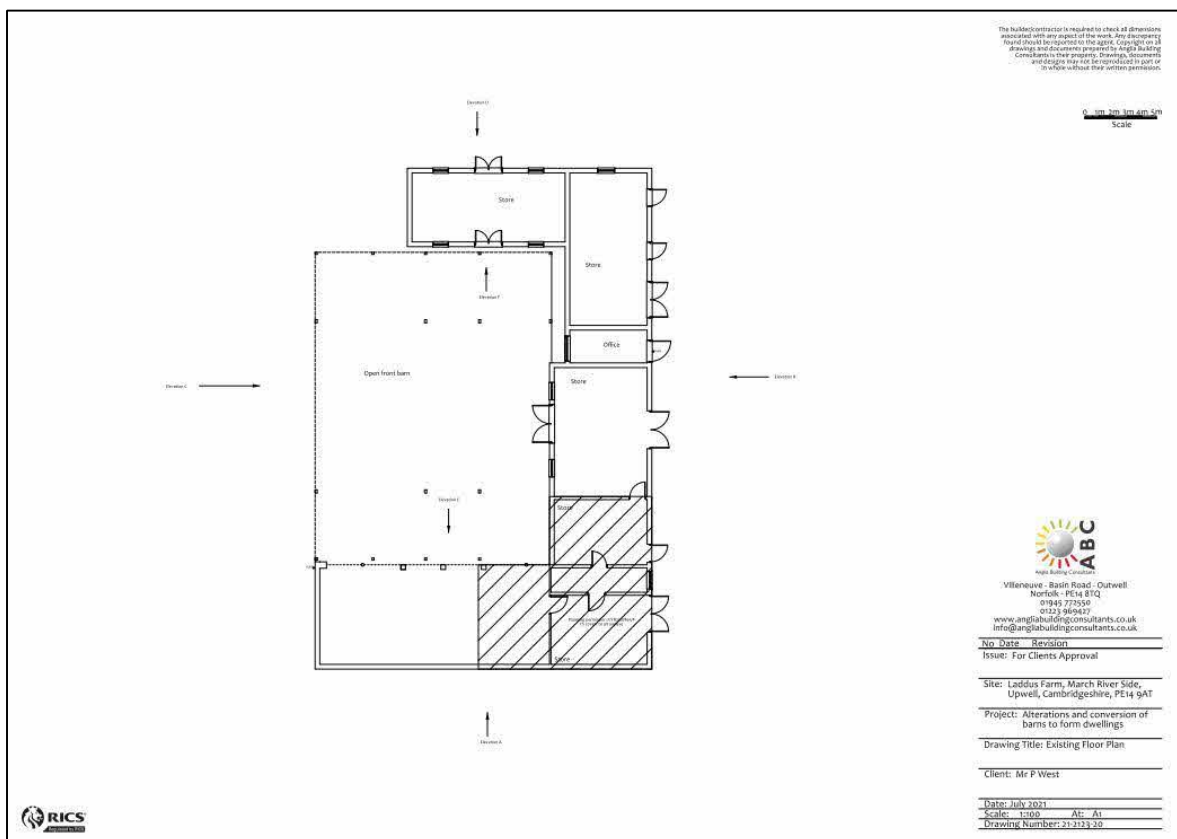
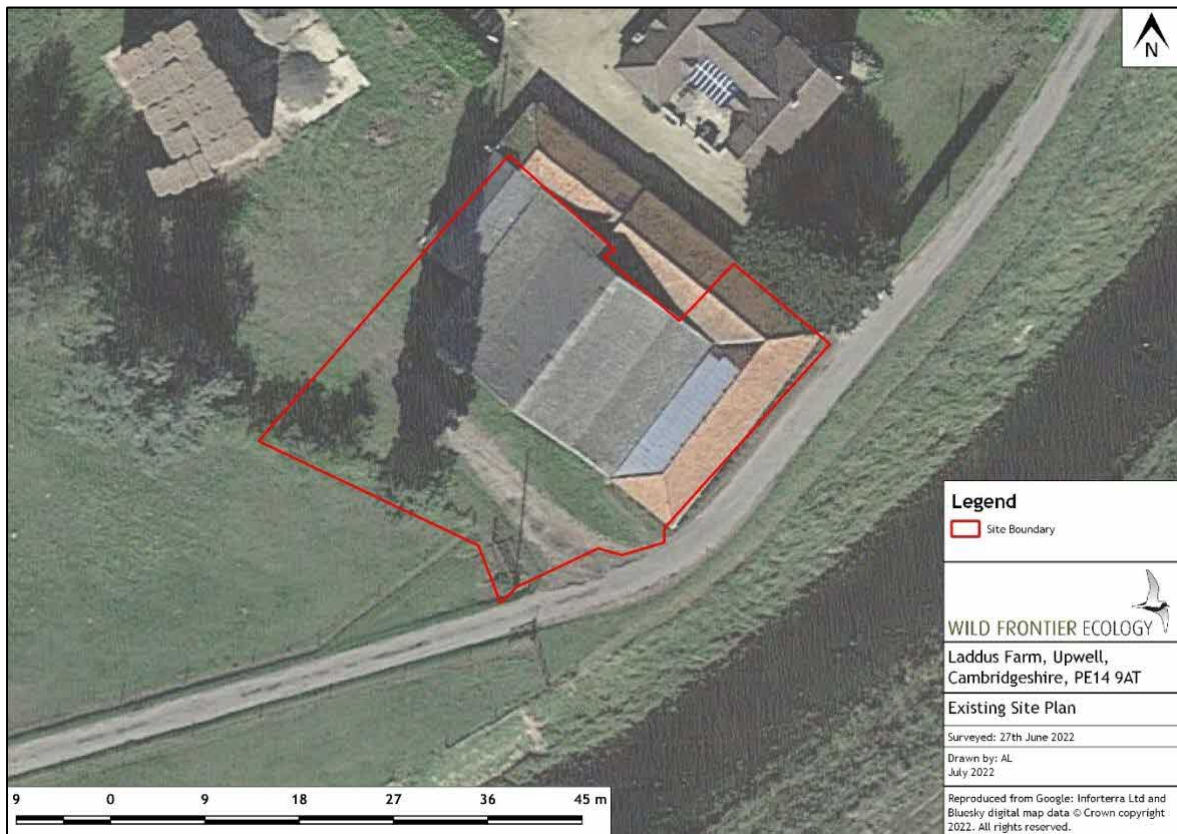
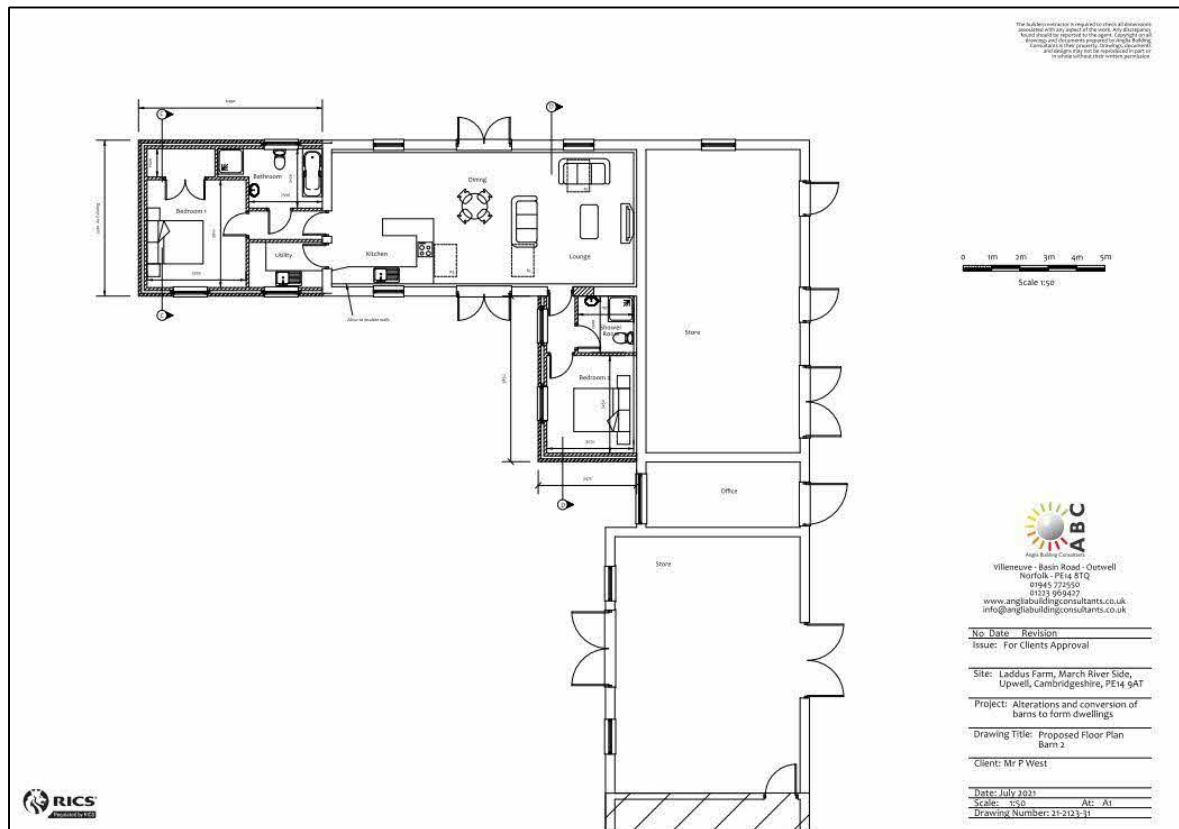




Figure 5. Proposed Floor Plan for Barn in North-West (Barn 2)



2.2 Report Objectives

The purpose of this ecological report is to describe the habitats, protected and valued species potential, any designated nature conservation sites, and any other ecological issues within the potential zone of influence of the proposed development. This has allowed for an ecological assessment of the proposed development to be completed. Avoidance measures, mitigation, compensation and ecological enhancements are specified with the intention of achieving net gain as specified within the National Planning Policy Framework (NPPF).

2.3 Basis for Appraisal

This appraisal is based on the following drawings provided by the client:

- 21-2123-1 Location Plan - May 2021
- 21-2123-2 Existing Site Plan - May 2021
- 21-2123-20 Existing Floor Plan - July 2021
- 21-2123-22 Existing Elevations - October 2021
- 21-2123-30 Proposed Floor Plan Barn 1 - July 2021
- 21-2123-31 Proposed Floor Plan Barn 2 - July 2021
- 21-2123-33A Proposed Elevations - Flat Roof Option

3. Relevant Legislation and Policy

3.1 Statutory and Non-statutory Site Designations

The European Council Directive on the Conservation of Natural Habitats and of Wild Fauna and Flora (92/43/EEC) as amended directs the designation of important wildlife sites through the European Community as Special Areas of Conservation (SACs), and gives statutory protection to habitats and species listed in the Directive as being threatened or of community interest. Sites identified as candidate SAC (cSAC) are provided with the same level of protection as SAC.

Annex I of 92/43/EEC as amended lists habitat types which are regarded as being of European importance. Included within these are a number of ‘priority habitat types’ which are habitats regarded as being in danger of disappearance and whose natural range falls broadly within the European Union. This European law had been transposed into UK legislation by The Conservation (Natural Habitats) &c Regulations 1994, now replaced by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

Habitats of European-wide importance for birds are listed under the EC Wild Birds Directive (79/409/EEC) as amended. Habitats designated under this Directive are notified as Special Protection Areas (SPAs) and are identified for holding populations > 1% of the reference population as defined in Appendix 4 of the SPA review of bird species listed in Annex 1 of the same Council Directive. Sites identified as potential SPA (pSPA) are provided with the same level of protection as SPA. This has also been transposed into UK legislation by the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

SACs and SPAs, post Brexit, are referred to as “Habitats Sites” and retain the same level of protection as when the UK was an EU member state.

Wetlands of International Importance are designated under the Ramsar Convention.

3.1.1 National (UK) Site Designations

National ecological designations, such as Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs) are also afforded statutory protection. SSSIs are notified and protected under the jurisdiction of the Wildlife and Countryside Act 1981 (as amended). SSSIs are notified based on specific criteria, including the general condition and rarity of the site and of the species or habitats supported by it.

3.1.2 Non-Statutory County Site Designations

Local authorities may designate certain areas as being of local conservation interest. The criteria for inclusion may vary between areas. Most individual counties have a similar scheme; within Cambridgeshire such sites are designated as County Wildlife Sites (CWS). Designation of such sites does not itself confer statutory protection, but they are a material consideration when planning applications are being determined.

3.2 Species Designation and Protection

3.2.1 Bats

All bat species are listed under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Bats and their roosts also receive protection from disturbance from by the Wildlife and Countryside Act 1981 (as amended). This



protection extends to both the species and roost sites. It is an offence to kill, injure, capture, possess or otherwise disturb bats. Bat roosts are protected at all times of the year (making it an offence to damage, destroy or obstruct access to bat roosts), regardless of whether bats are present at the time.

3.2.2 Badgers

The Protection of Badgers Act 1992 makes it unlawful to knowingly kill, capture, disturb or injure an individual badger *Meles meles*, or to intentionally damage, destroy or obstruct an area used for breeding, resting or sheltering by badgers (i.e. a sett).

3.2.3 Riparian Mammals

The water vole *Arvicola amphibius* is protected in accordance with Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). It is an offence to intentionally damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection, or to disturb water voles whilst they are using such a place. It is also an offence to kill, injure, capture or possess water voles.

The otter *Lutra lutra* is protected in accordance with Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. It is an offence to intentionally kill, injure or take an otter from the wild, or to intentionally or recklessly damage, destroy or obstruct access to any habitat used by otters or to disturb the otters which make use of those habitats.

3.2.4 Birds

All bird species are protected under the Wildlife and Countryside Act 1981 (as amended). This prevents killing or injuring any bird or damaging or destroying nests and eggs. Certain species (including barn owl *Tyto alba*) are also listed under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), which prohibits intentionally or recklessly disturbing the species at, on or near an 'active' nest.

The British Trust for Ornithology (BTO) lists Birds of Conservation Concern (BoCC), which fall into three categories: Red-listed - species of high concern; Amber-listed - species of medium concern; and Green-listed - species of lower concern¹. Species are placed on these lists based, among other criteria, on the percentage decline of breeding or wintering populations in recent years. These lists do not indicate rarity for the species concerned, and many listed species are currently common and widespread.

3.2.5 Reptiles

All native reptiles are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended), and are afforded protection under Sections 9(1) and 9(5). For the reptile species occurring in East Anglia, adder *Vipera berus*, grass snake *Natrix helvetica*, slow-worm *Anguis fragilis* and common lizard *Zootoca vivipara*, this protection prohibits deliberate or reckless killing and injury but does not include habitat protection.

¹ Stanbury, A.J., Eaton, M.A., Aebischer, N.J., Balmer, D., Brown, A.F., Douse, A., Lindley, P., McCulloch, N., Noble, D.G. & Win, I. (2021). Birds of Conservation Concern 5: the status of our bird populations: the fifth birds of conservation concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain, available online at https://britishbirds.co.uk/sites/default/files/BB_Dec21-BoCC5-IUCN2.pdf

3.2.6 Great Crested Newts

The great crested newt *Triturus cristatus* is listed under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. The species is also protected by Sections 9(4) and 9(5) of the Wildlife and Countryside Act 1981 (as amended). It is an offence to knowingly or recklessly kill, injure, disturb, handle or sell the animal, and this protection is afforded to all life stages. It is unlawful to deliberately or recklessly damage, destroy, or obstruct the access to any structure or place used for shelter or protection; this includes both the terrestrial and aquatic components of its habitat.

3.2.7 Plants

Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) lists plant species which are afforded special protection. It is an offence to pick, uproot or destroy any species listed on Schedule 8 without prior authorisation, and all plants are protected from unauthorised uprooting (i.e. without the landowner's permission) under Schedule 13 of the Wildlife and Countryside Act 1981 (as amended).

A Vascular Plant Red List for England² provides a measure of the current state of England's flora measured against standardised IUCN criteria. Any taxon that is threatened - Critically Endangered (CR), Endangered (EN), Vulnerable (VU) - or Near Threatened (NT) does not have statutory protection but should be regarded as a priority for conservation in England. It should be noted that 'threat' is not synonymous with 'rarity'; some of the species concerned remain relatively common and widespread.

It is an offence to plant or cause to spread in the wild of certain plant species under Schedule 9 of the Wildlife and Countryside Act 1981 (as amended). Plant species relevant to the East of England are as follows:

Himalayan balsam *Impatiens glandulifera*
 Variegated yellow archangel *Lamiastrum galeobdolon* ssp *argentatum*
 Virginia creeper *Parthenocissus quinquefolia*
 False acacia *Robinia pseudoacacia*
 Water fern *Azolla filiculoides*
 Giant hogweed *Heracleum mantegazzianum*
 Knotweed species including Japanese knotweed *Fallopia japonica*
 Parrot's feather *Myriophyllum aquaticum*
 Floating pennywort *Hydrocotyle ranunculoides*
 Rhododendron *Rhododendron ponticum*
 Giant rhubarb *Gunnera tinctoria*
 New Zealand pigmyweed *Crassula helmsii*
 Waterweeds *Elodea* spp.

All waste containing Japanese knotweed comes under the control of Part II of the Environmental Protection Act 1990 and is classified as controlled waste.

3.3 Biodiversity Net Gain

The principle of net gain has been enshrined in law within the Environment Act 2021. There will be a two year transitional period before net gain becomes mandatory; this is expected to mean implementation in winter 2023. The Act sets the minimum net gain at

² Stroh, P.A., Leach, S.J., August, T.A., Walker, K.J., Pearman, D.A., Rumsey, F.J., Harrower, C.A., Fay, M.F., Martin, J.P., Pankhurst, T., Preston, C.D. and Taylor, I. (2014). A Vascular Plant Red List for England. Botanical Society of Britain and Ireland, Bristol.

10%, and makes provision for offsetting both on and off site. Sites where activity occurs, without planning permission, which lowers the biodiversity value of a site between 30th January 2020 and the implementation date will be expected to rely on the site's value prior to that activity. This is to avoid destruction of biodiverse sites in anticipation of the implementation of net gain. Calculations of net gain rely on a metric; there is a simplified metric for smaller sites.

3.4 Priority Species and Habitats

Other priority species and habitats are a consideration under the National Planning Policy Framework (NPPF) 2019, placing responsibility on Local Planning Authorities to aim to conserve and enhance biodiversity and to encourage biodiversity in and around developments. There is a general biodiversity duty in the Natural Environment and Rural Communities (NERC) Act 2006 (Section 40) which requires every public body in the exercising of its functions to 'have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity'. Biodiversity, as covered by the Section 40 duty, includes all biodiversity, not just the Habitats and Species of Principal Importance.

Section 41 of the NERC Act lists a number of species and habitats as being Species/Habitats of Principal Importance. These are species/habitats in England (commonly known as Priority Habitats/ Species) which had been identified as requiring action under the UK BAP, and which continue to be regarded as conservation priorities under the UK Post-2010 Biodiversity Framework. The protection of either Priority Species or Habitats is not statutory, but "specific consideration"³ should be afforded by Local Planning Authorities when dealing with them in relation to planning and development control. Also, there is an expectation that public bodies would refer to the Section 41 list when complying with the Section 40 duty.

Widespread Priority Habitats in East Anglia include:

- Arable field margins
- Traditional orchards
- Hedgerows
- Eutrophic standing waters
- Ponds
- Rivers
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland meadows
- Lowland fen
- Coastal and floodplain grazing marsh
- Reedbeds
- Lowland mixed deciduous woodland
- Wet woodland
- Wood-pasture and parkland

Widespread Priority Species in East Anglia (which have no specific legal protection) include:

Common toad *Bufo bufo*

³ JNCC (2015). UK BAP priority species and habitats

<http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx>

Hedgehog *Erinaceus europaeus*
Brown hare *Lepus europaeus*
Harvest mouse *Micromys minutus*
Small heath butterfly *Coenonympha pamphilus*
Wall butterfly *Lasiommata megera*
Cinnabar moth *Tyria jacobaeae*
Polecat *Mustela putorius*

Many red-listed bird species are also Priority Species.

3.5 National Policy

The overarching policy guidance for biodiversity is included within the NPPF. Section 15 of this document (Conserving and Enhancing the Natural Environment) outlines the approach that Local Authorities should adopt when considering ecological issues within the planning framework, including the principles of the Mitigation Hierarchy. This espouses that in addressing impacts on valued features, avoidance should be the first option considered, followed by mitigation (minimising negative impacts). Where avoidance and mitigation are not possible, compensation for loss of features can be used as a last resort. Paragraph 180(d) of the NPPF requires opportunities to incorporate biodiversity improvements in and around development as part of the design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate. Paragraph 179 specifies that plans should identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including locally designated sites (such as CWS). It also promotes the conservation, restoration and enhancement of priority habitats and ecological networks and the protection and recovery of priority species.

4. Assessment Methods

4.1 Desk Study

A data search was completed with the Cambridgeshire and Peterborough Environmental Records Centre (CPERC) in July 2022. The data search obtained biological records and information on any designated nature conservation sites within the proposed development site and the surrounding 2 kilometres (km) area.

The proposed development site and nearby surrounding area was reviewed using Ordnance Survey (OS) maps and aerial photographs with the aim of identifying potential ecological issues or sensitive habitats, such as nearby ponds or connected hedgerows. National Character Area profiles⁴ were consulted for site context where appropriate. Natural England's Multi-Agency Geographic Information for the Countryside (MAGIC) maps⁵ was checked for any nearby European Protected Species (EPS) mitigation licences.

Publicly available aerial photographs were also consulted for site context and history. The series of photographs on Google Earth™ was also reviewed for older images and maps.

The previous planning application with Fenland District Council (planning application reference: F/YR20/0863/F) for an adjoining barn was reviewed. This application included a Biodiversity Conservation Survey Report with surveys carried out in August 2020 by Cliff Carson⁶.

4.2 Extended UK Habitat Survey

An extended UK Habitat (UKHab) survey of the site was undertaken on 27th June 2022 by Susannah Dickinson BSc MCIEEM (Natural England class bat licence reference 2016-22497-CLS-CLS) and Alexander Lowe BSc MArborA. The survey method followed the UK Hab guidelines⁷, with the methods being 'extended' to include a general evaluation of potential habitats for any protected or valued species. Photographs were taken to record key features/views.

Only habitats on the landholding were available to survey. Habitats outside of the landholding were appraised as far as possible by viewing from the landholding, public footpaths and roads, as well as by using publicly accessible aerial photographs.

4.3 Building Inspection

The building inspection was also performed on 27th June 2022 by S. Dickinson and A. Lowe.

The barns were investigated for evidence of bat use and bat roosting potential. The search for bat roosts was not only for bats in situ, but also for the more commonly encountered field signs including droppings, urine and body oil stains, and accumulations of feeding remains (insect parts). A torch, ladder, binoculars and a digital endoscope were all on-hand for use. Signs of building use by barn owls and other birds were also searched for including nesting sites, feathers, droppings and pellets.

⁴ <https://www.gov.uk/government/publications/national-character-area-profiles-data-for-local-decision-making/national-character-area-profiles#ncas-in-the-east-of-england>

⁵ <https://magic.defra.gov.uk/MagicMap.aspx>

⁶ Cliff Carson (no date provided). Biodiversity Conservation Survey Report.

⁷ UK Habitat Classification Working Group (2018). UK Habitat Classification User Manual. Ecountability Ltd, Kentisbeare

4.4 Bat Emergence Surveys

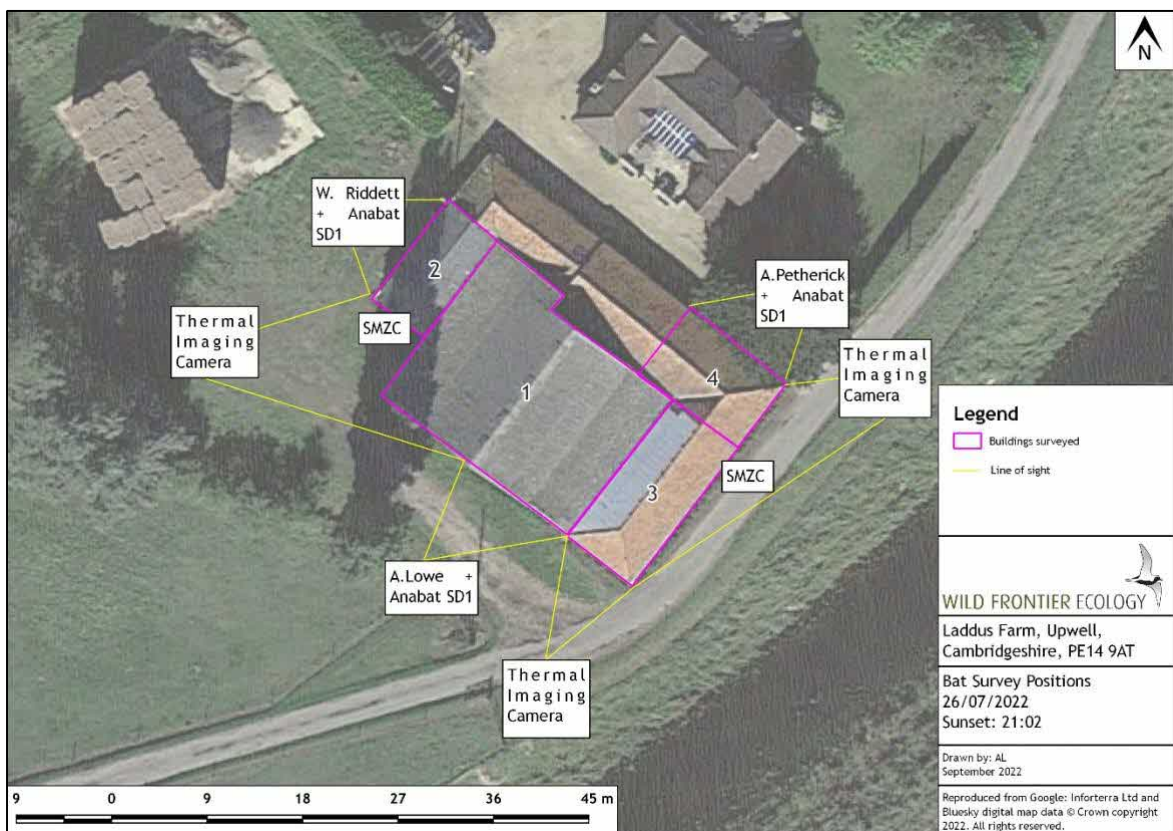
4.4.1 Dusk Emergence Survey 26/07/2022

Surveys were undertaken in accordance with the Bat Conservation Trust (BCT) guidance⁸ and Thermal Imaging Guidance⁹. The dusk emergence survey was completed by A. Lowe, William Riddett BA ACIEEM and Alice Petherick BA MA, positioned on site as shown in Figure 6. The surveyors monitored the exterior of the building with recording devices (AnaBat SD1 detectors) to detect any bats emerging from the building. Surveyors were assisted by two Pulsar Helion XP28 thermal imaging cameras as well as a HIK Owl thermal imaging camera, all digitally recording and paired with Song Meter Zero Cross (SMZC) bat detectors.

The survey commenced approximately 15 minutes before sunset and continued until 90 minutes post-sunset.

Sunset was at 21:02 and the conditions were good: cloud cover was estimated at 90%, there was no precipitation, there was a light to moderate breeze and the air temperature started at 16 °C at the beginning of the survey, falling to 15 °C by the end of the survey.

Figure 6. Dusk Emergence Survey Positions 26/07/2022



⁸ Collins, J. (ed.) (2016). Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn.). Bat Conservation Trust, London.

⁹ Fawcett Williams, K. (2019) Thermal Imaging: Bat Survey Guidelines

4.4.2 Dusk Emergence Survey 22/08/2022

The second dusk emergence survey was completed by Mary Goddard BSc MSc ACIEEM (Natural England bat survey class licence registration 2019-43829- CLS-CLS) and W. Riddett, positioned on site as shown in Figure 7. The surveyors monitored the exterior of the barn with recording devices (AnaBat SD1 detectors) to detect any bats emerging from the barn. Surveyors were assisted by one Pulsar Helion XP28 thermal imaging cameras as well as two HIK Owl thermal imaging cameras, all digitally recording and paired with two Song Meter Minis and one AnaBat Express bat detector.

The survey commenced approximately 15 minutes before sunset and continued until 90 minutes post-sunset.

Sunset was at 20:10 and the conditions were good: cloud cover was estimated at 95%, there was no precipitation, there was a light breeze and the air temperature started at 22°C at the beginning of the survey, falling to 20°C by the end of the survey.

Figure 7. Dusk Emergence Survey Positions 22/08/2022



5. Results

5.1 Desk Study

5.1.1 Local Landscape Description

The proposal site is situated approximately 2km to the south-west of the Fenland village of Upwell in Cambridgeshire. The road, March Riverside, is a no-through road with a small number of dwellings and farm buildings scattered along it. Approximately 15-metres (m) to the south of the site is the River Nene. No ponds were found within 250m of the site on OS maps.

The wider landscape is characterised by flat arable fields with dividing drainage ditches with few hedgerows, trees or woodland areas. The National Character Area description for the Fens¹⁰ states that the landscape is “distinctive, historic and human-influenced wetland landscape lying to the west of the Wash estuary, which formerly constituted the largest wetland area in England. The area is notable for its large-scale, flat, open landscape with extensive vistas to level horizons”.

5.1.2 Pre-existing Information on Designated Sites

The data search showed that there are no statutory or non-statutory designated sites within 2km of the proposal site (Figure 8 below).

5.1.3 Pre-existing Information on Protected and Valued Species

The data search with CPERC returned 66 records of 34 species of conservation concern, some of which are legally protected. None of the records pertain directly to the site.

The majority of records (43) are of bird species, many of which are waterfowl such as Bewick’s swan *Cygnus columbianus bewickii* likely due to the abundance of waterways in the surrounding area but there are also records of raptors and some farmland species.

There are no local records of great crested newt (GCN), reptile species or badger.

There are two records of water vole, the closest being 580m south-east of the site. There is one record for the wall butterfly *Lasiommata megera* 1.1km to the south-east and the remaining records are all of flowering plants including fringed water lily *Nymphaeoides peltata* recorded in the River Nene directly to the south of the site.

There are no records of bat species or Priority Species such as brown hare or hedgehog, but this should not be taken as evidence of absence.

A search of the MAGIC database showed no European Protected Species (EPS) mitigation licences within 2km of the site. The closest bat EPS mitigation licence (2020-46177-EPS-MIT-1) is located 4km west of the site just to the north of the town of March. The licenced period commenced in March 2021 and permits the destruction of a breeding site and resting place for Brown long eared bat *Plecotus auritus*, common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and Natterer’s bat *Myotis nattereri*.

¹⁰ <http://publications.naturalengland.org.uk/publication/6229624?category=587130>

The closest GCN EPS mitigation licence is located 6km west of the site, also just north of March. This licence (EPSM2010-1964) ran from 2013-2020. There is also one GCN licence return 1.3km south of the site from a survey in 2014 which found GCN to be present.

5.1.4 Previous Planning Application

Planning permission (F/YR20/0683/F) was granted for the conversion of an adjoining barn and was accompanied by a Biodiversity Conservation Survey Report by Cliff Carson¹¹. Little owl *Athene noctua* were recorded perching (not nesting) inside Barn 4. The barn was inspected, but no further bat surveys were carried out to ascertain the presence or absence of bats. The ash *Fraxinus excelsior* tree with a bat box to the north-east of the site was inspected in August 2020 and bat droppings were found underneath.

5.2 Site Survey

5.2.1 UK Habitats

An annotated map of the recorded habitats is provided in Figure 9 below. A plant species list is provided in Table 1 below and photographs are provided in Appendix 1.

The site is small, measuring just over 0.01 hectares in size and largely comprises a complex of barns with an access track to the south-west (Photo 1). There is also a lavender *Lavandula* sp. border, modified grassland and a small linear scrub feature with one tree. The River Nene lies just 15 metres to the south of the site (Photo 2).

The modified grassland (Photo 3) is of low ecological value as it dominated by the common grass species perennial ryegrass *Lolium perenne*, cocksfoot *Dactylis glomerata* and Yorkshire fog *Holcus lanatus*. It contains infrequent wildflowers such as white clover *Trifolium repens*, ribwort plantain *Plantago lanceolata*, greater plantain *Plantago major*, daisy *Bellis perennis* and pineappleweed *Matricaria discoidea*.

There is a lavender border to the south-east and south-west of Barn 3 (Photo 4) bordering the road. The south-western boundary has a mature Lombardy poplar *Populus nigra* 'Italica' embedded within elder *Sambucus nigra*, bramble *Rubus fruticosus* agg. and white willow *Salix alba* scrub.

Approximately 40m to the north-east of the red line boundary is an ash tree with a bat box (Photo 5).

Table 1: Modified Grassland and Scrub Species List

Scientific Name	Common Name	Abundance on site	Conservation status
<i>Lolium perenne</i>	Perennial ryegrass	Dominant	Least concern
<i>Dactylis glomera</i>	Cocksfoot	Abundant	Least concern
<i>Holcus lanatus</i>	Yorkshire fog	Abundant	Least concern
<i>Trifolium repens</i>	White clover	Occasional	Least concern
<i>Plantago lanceolata</i>	Ribwort plantain	Occasional	Least concern
<i>Plantago major</i>	Greater plantain	Occasional	Least concern
<i>Matricaria discoidea</i>	Pineapple weed	Occasional	Least concern

¹¹ Fenland District Council. Planning application F/YR20/0683/F. Available at: <https://www.publicaccess.fenland.gov.uk/publicaccess/applicationDetails.do?activeTab=document&keyVal=QGNV60HE06P00>

<i>Bellis perennis</i>	Daisy	Occasional	Least concern
<i>Cirsium arvense</i>	Creeping thistle	Rare	Least concern
<i>Heracleum sphondylium</i>	Hogweed	Rare	Least concern
<i>Urtica dioica</i>	Stinging nettle	Rare	Least concern
<i>Lavandula sp.</i>	Lavender	Border planting	N/A
<i>Rubus fruticosus agg.</i>	Bramble	Scrub - frequent	Least concern
<i>Salix alba</i>	White willow	Scrub - frequent	Least concern
<i>Sambucus nigra</i>	Elder	Scrub - rare	Least concern
<i>Populus nigra 'Italica'</i>	Lombardy poplar	One tree	N/A
<i>Fraxinus excelsior</i>	Ash	One tree with bat box	N/A
<i>Prunus laurocerasus</i>	Cherry laurel	Hedgerow dominant	N/A

Overall, within the red line boundary of the site, the habitats are small and of low ecological value, providing only limited interest for invertebrates, small mammals and nesting birds. The notable exception to this is the barns which provide good habitat for nesting birds and potentially bats (see 5.2.2). In the immediate surroundings, the River Nene and the surrounding scrub and trees provide good foraging habitat for bats, birds and mammals.

5.2.2 Building Inspection

The barn complex within the site boundary is comprised of four barns (Barns 1-4 as labelled on Figure 9).

Both barns 1 and 2 were found to have 'low' potential to support roosting bats, in accordance with BCT roost potential classifications.

Barn 1 is an open-fronted barn constructed from cement-fibre board (Photo 9). The roof is supported by machine cut timbers and wooden support posts. There is no roof lining and the potential roost features for bats are limited to small areas where the cement fibre board meets the machine cut timbers. No bats or bat signs were found within this barn. An active woodpigeon *Columba palumbus* nest was observed within the barn.

Barn 2 is of red brick construction with no significant gaps between bricks. There is a telegraph pole with a floodlight immediately adjacent to the barn which lights up the north-eastern half of the roof at night. The roof is comprised of square slate tiles which are mostly tight with a few gaps and lifted tiles. In particular, there are potential bat access points under the tiles at the gable end on the south-west side of the barn (Photo 10). The barn has wooden fascia boards which are tight to the brickwork in the south-west and come away slightly from the brickwork in the north-east; however, these spaces were cobwebby. Inside, the roof is unlined and comprised of machine cut timbers. There are two windows and a door, both timber framed and without gaps. The barn is used for



storage and was found to be very cobwebby inside (Photo 11). No bats or bat signs were observed. Two inactive wren *Troglodytes troglodytes* nests were observed inside the barn either side of the main timber door.

Barn 3 is of red brick construction which has a few gaps that are superficial in nature (Photo 12). The roof is divided into two halves, the south-east side is comprised of single roll tiles with multiple gaps and missing tiles and a bitumastic roof lining. The north-west side is tin with no lining. There are broken and misaligned hip tiles and broken-up mortar which provide potential bat roost features. Machine cut timbers and wooden posts on brick plinths support the roof. There is wooden fascia board on the south-east side in poor condition with gaps against the red brick wall. The barn is open to the north-west and at the time of survey was being used for straw storage (Photo 13).

Approximately 15 bat droppings were found within Barn 3 at the north-eastern end where it adjoins Barn 4 (Photo 14). Under the apex, droppings were found on the wall and on the wooden planks on the floor, confirming the presence of a bat roost.

Barn 4, whilst not the subject of this planning proposal, was inspected as it adjoins barn 3 which is proposed for conversion. Barn 4 is of similar construction to Barn 3 albeit the roof is completely comprised of single roll tiles (Photo 15). There are three separate rooms inside barn 3 (Photo 16), with timber framed doors with gaps present in the frames. Approximately seven butterfly wings (possible brown long-eared bat *Plecotus auritus* feeding remains) were found near the door between the south-eastern and central rooms and six butterfly wings were also found in the north-western room (Photo 17). It is possible however, that these wings resulted from spiders which were abundant in all three rooms in barn 4. No bats or other possible bat signs were observed. Overall, Barn 4 was assessed as having 'moderate' potential for roosting bats per BCT guidelines.

Barns 1 and 2 were found to have negligible hibernation potential and barns 3 and 4 were found to have low hibernation potential.

5.3 Bat Emergence Surveys

5.3.1 First Survey 26/07/2022

The results of the first bat emergence survey are shown in Figure 10.

A thermal camera monitoring barn 3 recorded one common pipistrelle *Pipistrellus pipistrellus* emerging from the south-eastern eaves at 21:44 (Photo 18).

Another thermal camera monitoring barn 2 recorded a total of 10 common pipistrelles emerging between 21:13 - 22:01 from underneath the tiles on the southern gable end of the barn near the apex (Photo 19).

Surveyors noted a noctule *Nyctalus noctula* commuting overhead at 21:49. Commuting and foraging soprano *Pipistrellus pygmaeus* and common pipistrelles were also noted by surveyors throughout the survey.

5.3.2 Second Survey 22/08/2022

The results of the second bat emergence survey are shown in Figure 11.

A thermal imaging camera observed one soprano pipistrelle emerging at 20:52 from inside barn 3 at the northern end at the apex (Photo 20). The same thermal imager also observed a single common pipistrelle bat emerging from the same niche as the soprano

pipistrelle at 21:29. M. Goddard also recorded bat droppings on the fascia of the south-east corner of barn 3 near where an emergence was observed in the first survey.

A single brown long-eared bat was observed by M. Goddard flying inside barn 4 at 21:17, having emerged inside the barn. It is thought to have likely emerged from the ridge inside the barn. At a later check, the bat was observed to still be present in barn 4 at 21:45.

Passing common pipistrelles, soprano pipistrelles and noctule bats were also recorded by surveyors.

5.4 Trail Camera Survey

The trail camera recorded no evidence of badgers using the excavations. A fox, a rabbit and domestic dogs were all observed making infrequent visits to the burrow entrances throughout the camera deployment (Photos 21 and 22). It was noted by the surveyor collecting the camera (M. Goddard) that the sticks had moved (likely as a result of the above mammals). Fox, dog and badger prints were found near the holes and a fox scat was found nearby.

5.5 Constraints and Limitations of Survey

The surveys were not affected by notable constraints.

5.6 Further Survey Requirements and Expiry Dates

The habitat survey and building inspection are valid for at least one year, until July 2023.

Works to the barns will require a European Protected Species (EPS) bat mitigation licence. The bat emergence surveys completed in 2022 will be valid for a licence application until April 2023. Should a licence be applied for after April 2023 (licences may only be applied for once full planning permission has been granted and all wildlife conditions discharged), further bat emergence surveys from the most recent survey season (May - August 2023) will be required.



Figure 8. CPERC Map of Designated Sites

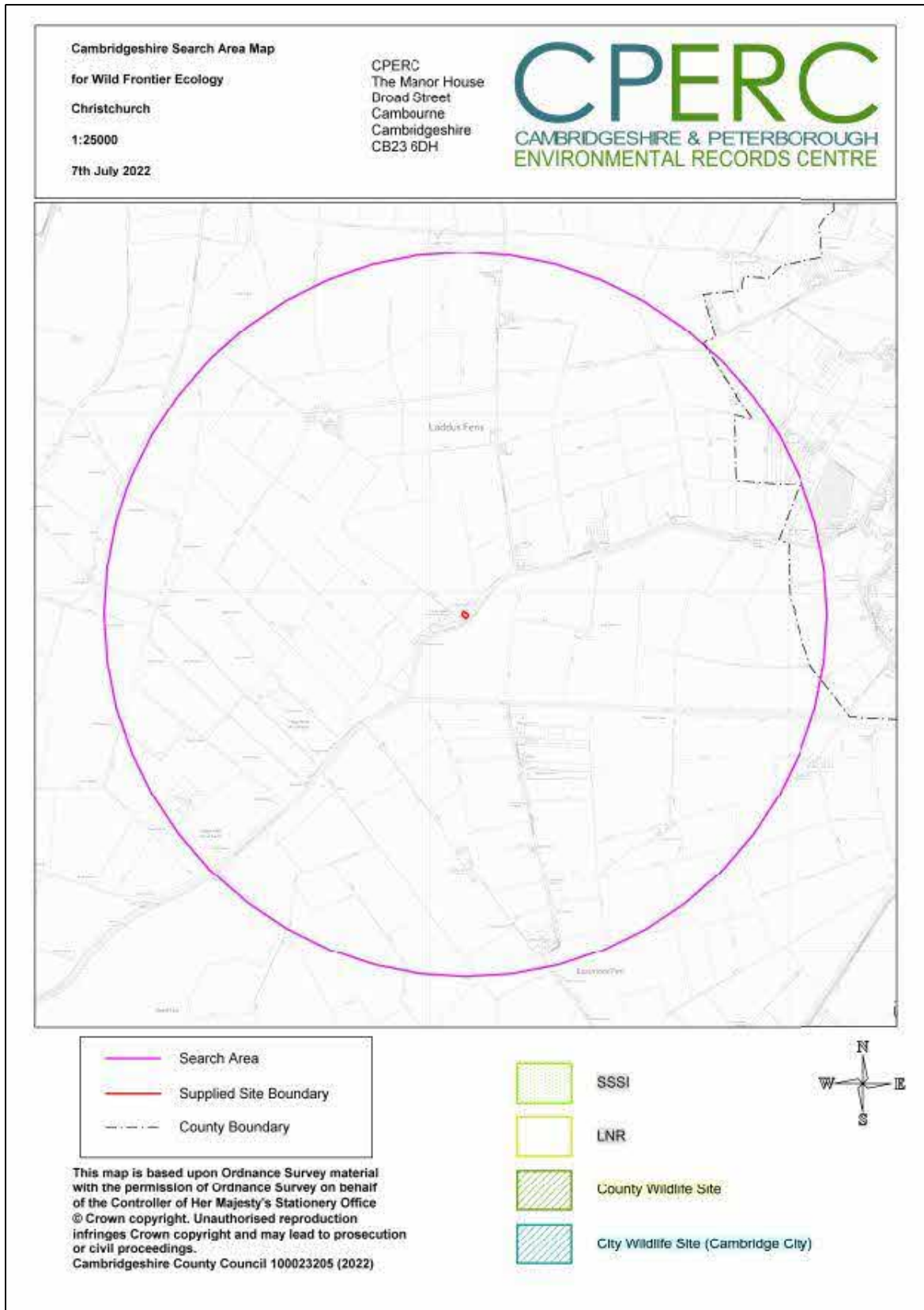


Figure 9. UK Habitats and Building Inspection Results

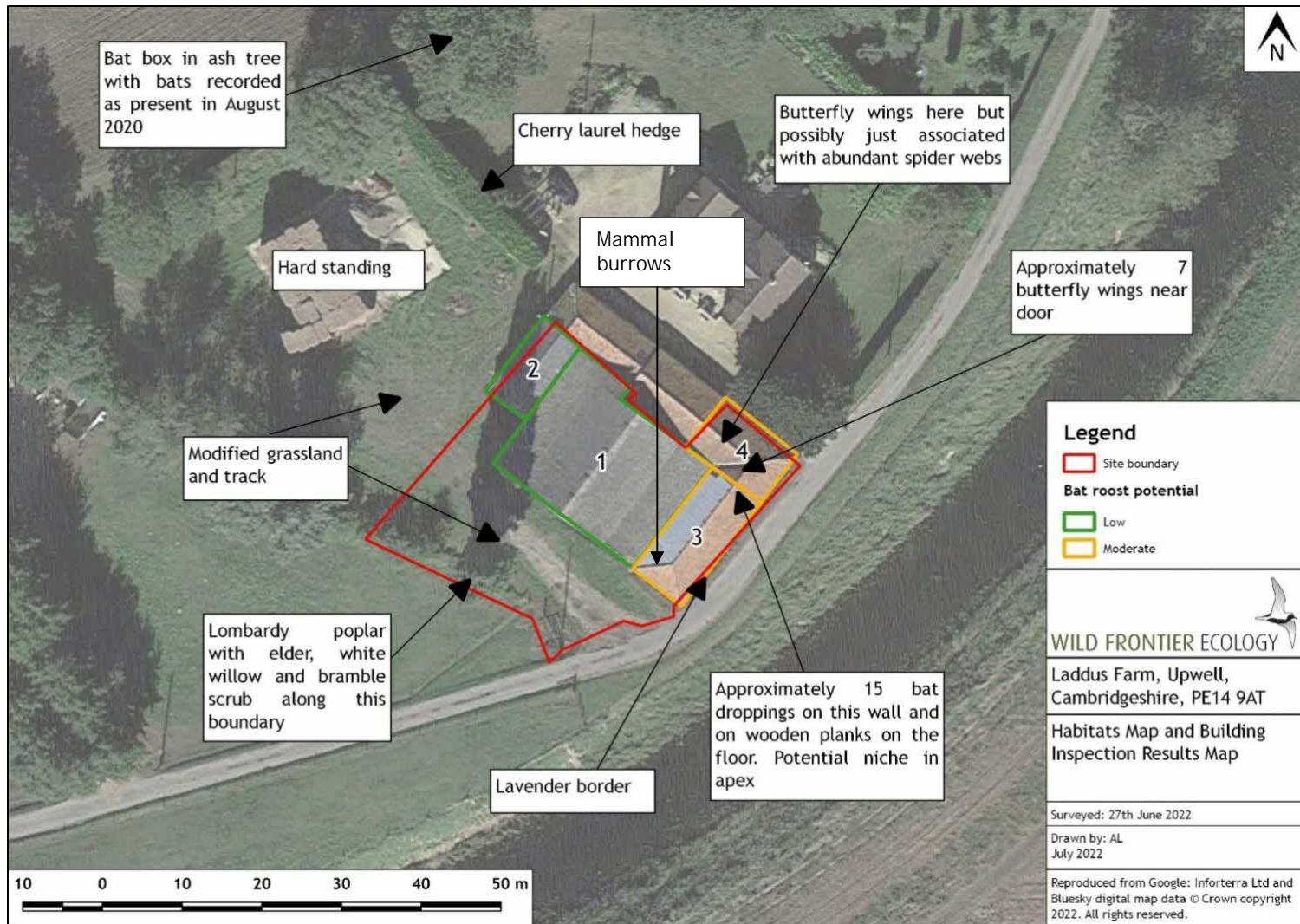


Figure 10. Results of the First Bat Emergence Survey 26/07/2022



Figure 11. Results of the Second Bat Emergence Survey 22/08/2022



6. Impact Assessment

6.1. Potential Impacts on Ecological Receptors

This impact assessment is made with reference to the CIEEM EcIA Guidelines¹².

Throughout, italicised words are used in the technical sense defined within the CIEEM guidance. This refers to the geographical context of the impact or effect. Hence, the following geographical frame of reference will be used to describe the ecological impacts and effects, or adapted to suit local circumstances:

International and European
National
Regional
County
District*
Local

*District level is not listed in the EcIA guidance, but is included within WFE reports as it is a useful and readily identifiable geographic unit.

The local geographical context for the proposal site is defined here as the civil parish of Upwell, in which the site is situated. The district context is Fenland, the county context is Cambridgeshire and the region is East Anglia.

6.1.1. Impact Magnitude

The EcIA guidelines espouse a quantification of impact/effect magnitude where possible. Where this is not available or uncertain, impact magnitude categories and criteria are defined based on Byron (2000)¹³. These categories are often also used as shorthand to summarise magnitude.

Major negative - that which has a harmful effect on the integrity of a conservation site or the conservation status of a population of a species within a defined geographical area; e.g., fundamentally reduces the capacity to support wildlife for the entirety of a conservation site, or compromises the persistence of a species' population at a defined locality.

Intermediate negative - that which has no adverse effect on the integrity of a conservation site or the conservation status of a species' population, but does have an important adverse effect in terms of achieving certain ecological objectives; e.g., sustaining target habitat conditions and levels of wildlife for a conservation site, or maintaining population growth for a species.

Minor negative - some minor detrimental effect is evident, but not to the extent of the above.

Neutral - that which has no predictable effect.

¹² CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: 3rd edition. Chartered Institute of Ecology and Environmental Management, Winchester

¹³ Byron H. (2000). Biodiversity Impact - Biodiversity and environmental impact assessment: a good practice guide for road schemes. The RSPB, WWF-UK, English Nature and the Wildlife Trusts, Sandy

6.1.2 Positive or Negative Impacts/ Effects

The nature of a predicted impact is as per CIEEM definition:

“Positive impact - a change that improves the quality of the environment e.g. by increasing species diversity, extending habitat or improving water quality. Positive impacts may also include halting or slowing an existing decline in the quality of the environment.

Negative impact - a change which reduces the quality of the environment e.g. destruction of habitat, removal of species foraging habitat, habitat fragmentation, pollution.”

6.2 Duration of Impact/ Effect

Impacts/ effects are described as short, medium or long-term, and as either permanent or temporary.

6.3 Impact/ Effect Reversibility

Reversibility is judged per the CIEEM Guidelines for Ecological Impact Assessment description¹⁴: “An irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation.”

6.4 Impact/ Effect Significance

The CIEEM Guidelines for Ecological Impact Assessment provide a working definition of ‘significant effects’ which includes the statements:

“For the purpose of EclA, ‘significant effect’ is an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’ or for biodiversity in general.” and “In broad terms, significant effects encompass impacts on structure and function of defined sites, habitats or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution).”

In this assessment, a significant impact is not attributed to any effect on a receptor which is predicted to occur at no greater than minor negative magnitude. Similarly any impact, regardless of magnitude, is not regarded as significant if its geographic scale of importance is lower than a local/ parish level.

6.5 Description of Impacts/ Effects

A number of impacts/ effects on ecological receptors may result from the proposed development.

6.5.1. Change of Land Use

The development will involve the demolition of one open-fronted barn (barn 1) and the conversion of two barns (barns 2 and 3) to holiday let use. Barn 2 will also be extended. A small amount of the modified grassland habitat may be lost for a new driveway although this has not been shown on the plans currently available.

¹⁴ CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland: 3rd edition. Chartered Institute of Ecology and Environmental Management, Winchester

6.5.2. Construction Activities

The activity, noise and other general disturbance from, movements of construction machinery and personnel could kill, injure or disturb animal species (including bats) using the site or immediately adjacent areas. Disturbance impacts need to be viewed in the context of the existing baseline of the current residential usage of the house to the north-west and occasional accessing of the barns for storage. Construction disturbance would temporarily exceed these baseline levels of disturbance.

6.5.3. Operational Activities

The proposal is to convert the barns into two holiday let units. There would therefore only be sporadic, temporary increases to the human population of the site which would be negligible compared to the population of Upwell (population 2,750¹⁵). There may also be a small increase in the vehicular usage of the site, but this is expected to have a negligible impact for ecological receptors. There is a potential impact from night-lighting of the site which would negatively impact the existing bat populations confirmed at the site, as well as other nocturnal wildlife in the nearby surrounding area.

6.6 Designated Sites

There are no statutory or non-statutory designated sites within 2km of the proposal site. Neutral impacts to these sites are therefore certain.

6.7 Habitats

It is feasible that a small amount of the modified grassland on the site as well as some of the lavender border may be lost when the barns are converted. Temporary losses may be incurred during construction from the passage of construction machinery or storage. Such losses of grassland may be made permanent if new parking areas are constructed to support the new holiday lets. These habitats are of low ecological value, small in size and not uncommon locally. A neutral impact to valued habitats is therefore predicted.

6.8 Bats

6.8.1 Roosting Bats

Barns 2, 3 and 4 have been confirmed as containing bat roosts.

Barn 2 was found to support a small maternity colony of common pipistrelle bats, supporting up to 10 individual bats. Barn 3 was found to support two day roosts observed being used by three bats including common and soprano pipistrelle. Barn 4, which already has planning permission to be converted to an annexe, was found to support a day roost and feeding perch for a brown long-eared bat.

On a national scale, The State of the UK's Bats 2017¹⁶ reports that common and soprano pipistrelle bats have shown statistically significant population increases since 1999 (albeit from a much reduced baseline) with a population estimate across Great Britain of 3,040,000 for common pipistrelle and 4,670,000 for soprano pipistrelle¹⁷. The British

¹⁵ Office for National Statistics (2021) Upwell Parish, Local Area Report: www.nomisweb.co.uk/reports/

¹⁶ JNCC and Bat Conservation Trust (2017). The State of the UK's Bats 2017. Available at: https://cdn.bats.org.uk/uploads/pdf/State_of_UKs_Bats_2017-2.pdf?v=1541085357

¹⁷ Mathews, F., Kubasiewicz, L.M., Gurnell, J., Harrower, C.A., McDonald, R.A. & Shore R.F., 2018. A Review of the Population and Conservation Status of British Mammals. A report by the

population of brown long-eared bats is estimated to be 934,000 with a key driver of change being the loss of viable roosts to building conversions¹⁵.

Following Figure 4 of Natural England's guidance¹⁸, a small maternity roost for common pipistrelle had medium conservation significance. Day roosts for common and soprano pipistrelle as well as a feeding perch for a brown long-eared bat both have a low level of conservation significance. The impact of the loss of these roosts on the local common pipistrelle population is therefore estimated as intermediate negative at a local scale whilst the impact on soprano pipistrelle and brown long-eared bat populations is estimated as minor negative at a local scale.

A European Protected Species (EPS) mitigation licence will be required to legally proceed with the works to barns 2, 3 and 4.

6.8.2 Foraging Bats

Due to the local landscape of the River Nene and small patches of scrub and grassland, as well as the confirmed presence of roosts on the site, it is clear that foraging and commuting bats do occur on and around the site. Insensitive night-lighting both during construction and subsequent operation could disrupt foraging or commuting bats and other nocturnal species using the site. This could lead to intermediate negative impacts in the long-term; best practice mitigation measures are therefore advised.

6.9 Regard for Article 12(1) of the Habitats Directive

The surveys of the barn complex identified that the proposed conversion works would result in the destruction of bat resting places (i.e. roosts) such as would be considered an offence under Schedule 2 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019. Consequently, it is advised that there is a requirement for an EPS mitigation licence to legally proceed with the proposed development.

Local planning authorities are obligated to have regard to the requirements of the Habitats Directive in the discharging of their permitting function. To do this they must consider the potential for developments assessed as affecting European Protected Species to satisfy the three derogation tests set out in Regulation 53 of the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019 for licensing to permit otherwise unlawful activities.

The three derogation tests for licensing under the Habitats Regulations 2019 are:

1. The consented operation must be for "preserving public health or public safety or other imperative reasons of overriding public interest including those of a social or economic nature and beneficial consequences of primary importance for the environment";
2. There must be "no satisfactory alternative"; and

Mammal Society under contract to Natural England, Natural Resources Wales and Scottish Natural Heritage. Natural England, Peterborough. ISBN 978-1-78354-404-2.

¹⁸ Mitchell-Jones A.J. (2004) Bat mitigation guidelines. English Nature, Peterborough

3. The action authorised “will not be detrimental to the maintenance of the population of the species concerned at a favourable conservation status in their natural range”.

6.9.1 Test 1 - Overriding Public Interest

The overriding public interest of the proposed development is derived from the creation of two new holiday lets, plus economic benefits to contractors and suppliers, at the cost of minor negative ecological impacts that are considered to be both intermediate (for common pipistrelle) and minor (for soprano pipistrelle and brown long-eared bat) in magnitude and amenable to mitigation and compensation.

Although barn 4 already has planning permission to be converted to an annexe ancillary to the main house, conversion will still only be permissible if completed under the terms of the EPS mitigation licence. If the conversion works for barn 4 are to occur separately to the works proposed on barns 1-3, a phased EPS mitigation licence will be necessary, but if the works can all be done as one project then a non-phased licence will be appropriate. As the permitted works to barn 4 will require EPS mitigation licensing, the same three derogation tests need to apply: the same points relating to overriding public interest (due to creation of new ancillary accommodation from conversion of the barn) and benefits to contractors and suppliers, applies to barn 4.

The public interest from the proposals to all four buildings is largely restricted to the owners of the barns, although there would be some economic benefits to the building contractor and suppliers. This benefit is weighed against the ecological cost arising from the destruction of bat roosts used by relatively common species. Per Figure 4 of the English Nature Bat Mitigation Guidelines (2004)¹⁹, the roosts in question are of medium and low conservation significance (but only on a local geographic scale). The public interest is believed to outweigh an intermediate and minor impact on the local populations of common bat species for which effective mitigation is considered very likely to be able to be secured.

6.9.2 Test 2 - No Satisfactory Alternative

The proposal is to convert barns 2, 3 and 4. The alternatives to the proposed activity are:

(1) Do nothing - leave the existing barns as they are. This option would prevent the development as proposed (or, in the case of barn 4, the development as permitted). There would be no economic benefits and no related impacts on bats, at least in the short and medium-terms.

(2) Convert only the sections of the barns with no roosts. This option would prohibit repairing and converting the barns as proposed. The bat roost under the tiles in barn 2 would inevitably be lost as part of roof repairs to make the roof watertight. In barns 3 and 4 the roosts are accessed from inside the barns and therefore access would inevitably be lost when these buildings are enclosed to become habitable spaces. The roost at the eaves of barn 3 would also likely be lost as part of roof repairs. This option is therefore unrealistic.

(3) Proceed with the development such as will require roost disturbance/destruction and an EPS mitigation licence. This would provide the maximum social benefit, plus minor local economic and community benefits. The short-term ecological impact (i.e. the unavoidable destruction of bat roosts of low and medium conservation significance) is

¹⁹ Mitchell-Jones, A. J. (2004). Bat Mitigation Guidelines. English Nature, Peterborough

higher than Options 1 and 2; however, the impact has a high potential to be successfully mitigated.

Option 3 is believed to be the superior option as it provides the greatest net benefit to the public interest at a very minor ecological risk/cost.

6.9.3 Test 3 - Maintaining Favourable Conservation Status

The third test, maintaining a favourable conservation status for the local common and soprano pipistrelle and brown long-eared bat populations, is assessed as highly achievable for this proposal under EPS licensed mitigation and compensation conditions. All affected bat species are relatively common, and other local roosting opportunities are present such as in nearby trees, barns and existing residential properties. The favourable conservation status of the affected bat populations are judged extremely likely to persist in spite of the proposed development, so long as there is mitigation with respect to the undertaking of the works.

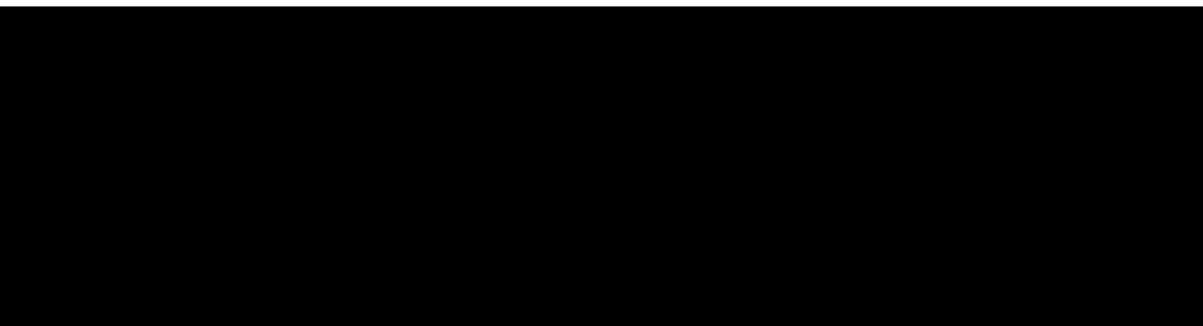
6.10 Birds

The barns on site were found to support birds' nests. Barn 1 had a woodpigeon nest and barn 2 had two wren nests. Due to the open-fronted nature of barns 1 and 3, they may at other times support other species such as swallow *Hirundo rustica*. Conversion of the barns could lead to the destruction of an active bird's nest which would constitute a legal offence and have a *minor negative, temporary impact* at a local scale. The long-term loss of barn 1 and the conversion of barns 2 and 3 may have a *minor negative, permanent impact* on breeding birds at a local level due to the loss of potential nesting places.

Whilst there is a Lombardy poplar and scrub habitat within the red line boundary and would likely support nesting birds, this habitat is not expected to be removed for the development.

Mitigation is required to avoid the disturbance of nesting birds and to provide compensatory nesting opportunities on the developed site.

In the longer term, there is an opportunity for the development to include features such as hedgerows, trees and shrubs which could be used by nesting birds. Advice regarding enhancement of the developed site for birds is provided in section 7.



6.12 Great Crested Newt

There are no ponds within 250m of the site and the closest GCN record is 1.3km south of the site. Terrestrial GCN presence on site is therefore considered very unlikely and a *neutral impact* to GCN is expected.

6.13 Reptiles

Given that there are no local records of reptile species in combination with the small size of the site and its isolation within the arable landscape, it is considered very unlikely that reptiles are present on the site. The nature of the works will also mostly only affect the barns rather than the surrounding grassland. Neutral impacts to reptile species are predicted.

6.14 Water Vole and Otter

The River Nene is approximately 15m south of the proposal site and has suitable habitat for otter and water vole. Given that the proposed works will focus on the barns where these species are unlikely to occur, it is anticipated that there will be a neutral impact to water vole and otter.

6.15 Priority Species

The data search returned no local records of brown hare or hedgehog in the local area. However, this does not provide conclusive evidence of absence; these species may still occur in low numbers near the site and may pass through the site occasionally. Open excavations or piles of materials during construction may prove hazardous to individuals of these species and result in injury/killing. Minor negative impacts are therefore possible during construction. Best practice mitigation measures are advised.

7. Mitigation

7.1 General Principles

The Mitigation Hierarchy is a key principle, with the sequential strategies given in order. This is interpreted by WFE, as it applies to built development, in Table 2 below.

Table 2: Mitigation Hierarchy

Action and sequential number	Description
1. Avoidance	The first stage is to seek options that avoid impacts/effects on ecological receptors, for example through adjusting the development footprint to avoid valued/sensitive features, or confining works to certain times of the year or the day when a receptor would not be impacted. An example would be adjusting a development footprint to avoid a hedgerow, thereby allowing it to be retained.
2. Mitigation	Where potential adverse impacts cannot be avoided, the next stage is to use measures aimed at reducing/ameliorating the magnitude and/or likelihood of impacts/effects. This can typically be done through the design of the project or adoption of specific working practices. An example would be restricting hedgerow removal to those sections which are of lower ecological value, thereby allowing relatively higher value sections of hedgerow to be retained; this reduces the magnitude of the adverse impact on hedgerow habitat.
3. Compensation	Where significant residual adverse impacts cannot be satisfactorily avoided or mitigated, the next stage is to use appropriate measures which subsequently offset, repair, reinstate or compensate for the predicted impact/effect. An example would be replanting a hedgerow after it has been removed.
Enhancement	The final stage of the Mitigation Hierarchy is distinct in that it does not seek to solely address adverse impacts; it goes over and above requirements for avoidance, mitigation and compensation. In accordance with the NPPF, developments should achieve net gains in biodiversity even if adverse impacts are not anticipated. Enhancement measures are those which seek to provide net benefits for biodiversity, and are advised wherever appropriate; this may include enhancements for receptors which are otherwise expected to experience adverse impacts. An example might be planting an additional hedgerow.

7.2 Bats

A method statement for carrying out the proposed works will be drawn up and agreed to with Natural England during the EPS mitigation licence application process. Following the English Nature Bat Mitigation Guidelines, the appropriate mitigation requirement for the level of impact currently predicted would include timing constraints for barn 2. If the roosts cannot be retained in situ then new roost facilities will need to be provided which are, if not like-for-like, then at least suitable based on the species' requirements.

The mitigation/compensation principles expected to be employed would be:

Conducting all works to barn 2 during September - February to avoid the bat maternity season. Works to barn 3 and 4 can occur at any time of year.

- Having a licensed bat worker provide an induction talk to contractors prior to starting works.
- Installing translocation roosts (bat boxes) on nearby trees/buildings to receive any bats encountered during building conversion works.
- Having a licensed bat worker present to monitor specified high-risk works (such as works to the tiles on barn 2, 3 and 4 and the roof spaces) to safely translocate any bats encountered during the works. Should a bat be found when the licensed bat worker is not present then all work must cease until advice has been sought from the licensed bat worker.
- Retaining roosts and/or access points in situ wherever possible.
- Integrating a number of compensatory bat roosts into the fabric of the new converted barns.
- Ensuring that any new roof lining within the converted barns is Bitumen 1F felt.

Night-lighting of the site will be avoided wherever possible (particularly around compensatory bat roosts) or sensitively designed if lighting is essential. The use of movement sensors such as Passive Infra-Red (PIR) sensors installed on lights can ensure that they come on only when needed and avoid unnecessary constant illumination. Positioning lights at angles of not greater than 90° to the ground (i.e. facing directly downwards) can reduce overspill of light and sky glow, which can disrupt the nocturnal behaviours of bats and insects²⁰. The illuminance at roost features and important commuting routes and foraging habitat must be below 0.2 lux on the horizontal plane and below 0.4 lux on the vertical plane **A lighting plan must be provided to demonstrate that lighting impacts will be avoided and minimised.**

²⁰ Stone, E.L. (2013). Bats and lighting: Overview of current evidence and mitigation guidance

7.4 Birds

Removal of woody vegetation will commence outside of the nesting bird season (which runs from 1st March to 31st August inclusive). If this is not possible a check by a Suitably Qualified Ecologist (SQE) will be undertaken to ensure no active nests are present on the site. Works to the barns will require an inspection prior to works to confirm the absence of active nests, which may be carried out by the SQE or by the building contractor. If any active nests are discovered they must be allowed to reach a natural conclusion without disturbance, interference or destruction. Nests will be protected from disturbance by a buffer zone advised by the SQE.

7.5 Best Practice Measures

Best practice measures are advised for effects which, although often not predicted to be of great magnitude, may affect valued ecological receptors in a way that would be preventable and/or a legal offence. The measures that will be applied to mitigate potential ecological impacts are as follows:

All building materials and waste materials will be stored above the ground, such as on pallets or in skips respectively. This measure will ensure that such materials do not provide a sheltering opportunity, attractive to invertebrates, amphibians, reptiles and small mammals.

Excavations will not be left open overnight, or else will be fitted with egress boards sloped at a shallow angle (<40°) or have shallow battered/sloped edges (also <40°) to allow any animals which fall in to climb out. Preferably all excavations will be backfilled at the end of each working day or covered overnight to prevent animals from falling in.

Works will be restricted to daylight hours only to prevent disturbance or accidental harm to nocturnal animals such as badgers and hedgehogs. Night lighting of the site will be minimised to reduce disturbance to other nocturnal animals such as bats and moths. Amphibians typically forage terrestrially at night, so restricting works to occur in daylight hours will minimise the chances of these species encountering the works.

8. Ecological Enhancements

8.1 Habitat Enhancements

In order to benefit pollinator species such as bees, butterflies and hoverflies, green spaces will be re-seeded with a diverse mixture of species to include at least four species of grass and eight species of herbs, such as a flowering lawn seed mixture. If planters are proposed, these will be planted with ‘pollinator friendly’ native plant species which are commonly labelled as such in garden centres.

If new trees or hedges are proposed, these should be native species which will maximise their value for wildlife. The following native flowering and fruiting species are advised:

Alder *Alnus glutinosa*
 Bird cherry *Prunus padus*
 Cherry plum *Prunus cerasifera*
 Crab apple *Malus sylvestris*
 Dogwood *Cornus sanguinea*
 Field maple *Acer campestre*
 Holly *Ilex aquifolium*
 Oak *Quercus robur*
 Rowan *Sorbus aucuparia*
 Silver birch *Betula pendula*
 Small-leaved lime *Tilia cordata*
 Wayfaring tree *Viburnum lantana*
 Whitebeam *Sorbus aria*
 Wild service tree *Sorbus torminalis*
 Willow (goat) *Salix caprea*
 Willow (crack) *Salix fragilis*
 Willow (white) *Salix alba*

Non-native species with high wildlife value such as fruit trees, firethorn *Pyracantha* spp. or lilac *Syringa vulgaris* could also be considered but are not preferred. Such species will provide new habitat for invertebrate and bird species. Other commonly used non-native species such as Leyland cypress *Cupressus x leylandii* and cherry laurel *Prunus laurocerasus* will not be used because they can have ecologically detrimental impacts such as acidification of underlying soils and overshadowing native vegetation.

8.2 Species Enhancements

8.2.1 Nesting Birds

At least two swift box style bird boxes will be installed on or within the fabric of the barns. Integral boxes are strongly advised due to relatively superior longevity and thermal insulation; they are also often considered to have a minimal visual impact on the barn relative to superficially mounted boxes.

Bird boxes, or nest chambers, will target species of conservation concern such as starling *Sturnus vulgaris*, house sparrow *Passer domesticus*, swift *Apus apus* or house martin *Delichon urbicum*. They can be used for nesting or year-round roosting. Nest boxes and chambers are more likely to be used by birds if installed in suitable positions on the

barns. Boxes intended for swifts are well used by other species of conservation concern and can be considered a universal nest chamber^{21,22}.

In general, bird boxes and chambers should be sited in or on gable ends, or under overhanging eaves, overlooking gardens or other green spaces, and with a clear/unobstructed flight line for easier access and egress. Exposed locations should be well insulated against overheating, by using integrated designs or suitably insulating material such as woodcrete.

The above listed species are loosely colonial nesters, so nest boxes targeting each species will be grouped on the site so as to encourage a colony of nesting birds to become established. Boxes/ chambers will be situated at least one metre apart as there is evidence that chambers situated too close together will not be used. Terrace-style nest boxes are therefore not advised.

Bird nest chambers in buildings may not be used immediately after construction, and it may take several years for the birds to become used to their availability, and for the habitat in the immediate area to become suitable for use by the target species. For example, house sparrows will require nearby shrubs of a certain size and density for roosting, foraging and social behaviour.

Nest box designs for these species are commercially available (such as swift bricks) and will be provided with instructions for appropriate installation. There is also an emerging British Standard (BS42021) for integral nestboxes.

8.2.2 Roosting Bats

In addition to any bat roost features (e.g. integral bat boxes) required under the terms of the EPS mitigation licence required for the development, lifted roof tiles and bat-accessible ridge tiles will be installed in the roofs of the barns to provide additional roosting niches. “Lifted” tiles to allow bat access can be achieved by either fitting purpose-made “bat access” tiles, or by simply lifting the free corner of a standard tile by approximately 20mm and supporting with a piece of batten or mortar. Bat accessible ridge tiles can be made by leaving a small gap in the mortar (e.g. by inserting a piece of batten while the mortar is wet and removing once it has started to set) leading to a hollow under a few adjacent tiles. A minimum of five “lifted” tiles and five accessible ridge tiles are advised.

Under the terms of the bat mitigation licence, it is expected that three temporary translocation bat boxes will be required to be installed on site (e.g. on mature trees) prior to works commencing, to provide a safe receptor location for bats removed from the buildings under licence. For the purposes of the licence these only need be temporarily in place during the works, but to provide further enhancements for roosting bats on the site these will be kept in perpetuity.

²¹ Martins, T (2021). Duchy Report on the Big Duchy Bird Box Survey 2021. <https://nansledan.com/duchy-nest-brick-project-boosts-endangered-wild-birds/>

²² Barlow, C., Priaulx, M. et al (2020). Swift Bricks - the “universal” nest brick. <https://actionforswifts.blogspot.com/p/sln.html>

9. Conclusions

The proposed demolition of one barn and conversion of two further barns (one of which will also be extended) at Laddus Farm, Upwell in Cambridgeshire has undergone an ecological assessment.

The assessment has concluded that there is no realistic risk of impacts to designated nature conservation sites.

The proposed development site is comprised of a complex of barns as well as a small amount of modified grassland, a linear scrub feature and one Lombardy poplar tree. No notable impacts to valued habitats are therefore expected.

A small maternity roost of common pipistrelle was found in barn 2. Day roosts for common and soprano pipistrelle were found in barn 3. A day roost and feeding perch for a brown long-eared bat was found in barn 4. A European Protected Species (EPS) mitigation licence for barns 2, 3 and 4 is required to legally allow these barns to be converted. The licence can only be applied for once full planning permission has been obtained and all wildlife related conditions have been discharged. The 2022 bat emergence survey data will be sufficient for a licence application up until the end of April 2023, after which top-up surveys would be required in order to support a bat licence application.

The mammal excavations in barn 3 were not found to be currently used by badgers. A total period of four weeks of trail camera monitoring is required before the holes in barn 3 can be removed under precautionary working methods.

Other ecological mitigation measures required for works include a pre-works check of all barns for actively nesting birds prior to demolition/conversion works beginning. Any woody vegetation clearance (not expected to be necessary) must also be undertaken between September and February for this reason. Limited and sensitive lighting of the converted barns will be needed to reduce impacts to foraging bats using the site and surrounding area. Best practice measures for materials storage and excavations during construction are also provided.

The site has scope to incorporate biodiversity enhancements in the form of two bird nest boxes and bat-accessible tiles being integrated into the converted buildings, as well as new tree planting.

Assuming the advised mitigation and enhancements included in this report are followed, the proposal is expected to result in a small number of positive impacts to nesting birds and roosting bats in the medium- to long-terms.



Appendix 1. Photographs

Photo 1. Laddus Farm, view of entrance and barns 1 and 3



Photo 2. River Nene 15 metres to the south of the site





Photo 3. View towards barn 2 showing modified grassland and Lombardy poplar



Photo 4. Lavender border beside barn 3





Photo 5. Ash tree with bat box - droppings found by previous survey in 2020 by Cliff Carson



Photo 6. Mammal excavations in barn 3



Photo 7. Further mammal excavations in barn 3

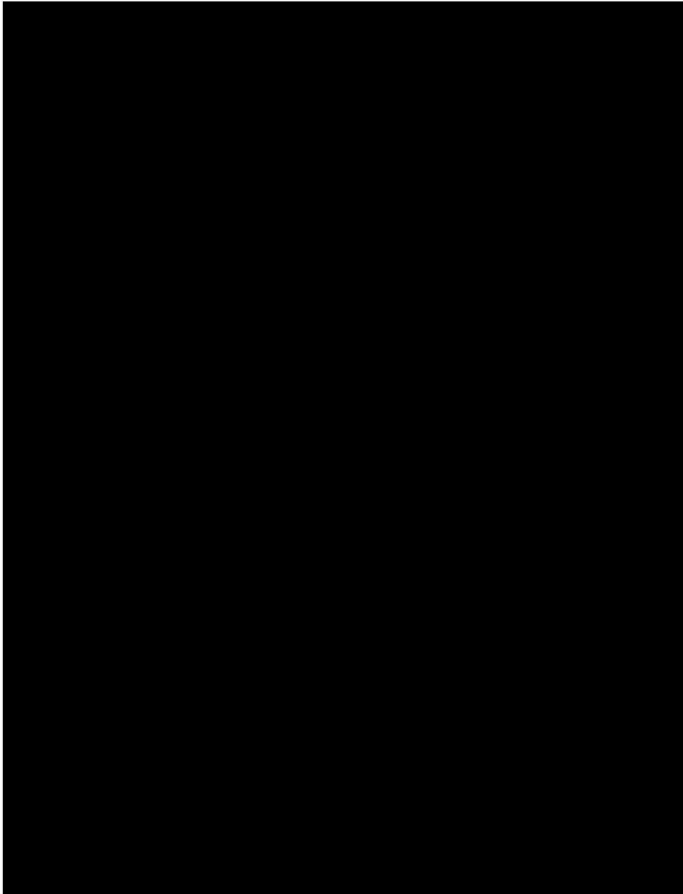




Photo 9. Inside barn 1



Photo 10. Exterior of barn 2 showing gable end bat access points



Bat access points

Photo 11. Inside barn 2



Photo 12. Barn 3 as viewed from March Riverside





Photo 13. North-west side of barn 3 - open fronted



Photo 14. Bat dropping at north-eastern end of barn 3 under apex





Photo 15. Barn 4



Photo 16. Unlined roof of barn 4



Photo 17. Small pile of butterfly wings in barn 4



Photo 18. Thermal imaging camera view of barn 3 during dusk emergence survey 26/07/2022 showing common pipistrelle emergence location (circled blue)





Photo 19. Thermal imager view of barn 2 during dusk emergence survey 26/07/2022 showing common pipistrelle emergence locations (blue circle)



Photo 20. Thermal imager view inside barn 3 during dusk emergence survey on 22/08/2022 showing soprano pipistrelle emergence





Photo 22. Fox observed by trail camera

