

Shrewton Lodge Farm

Preliminary Ecological Appraisal (PEA)

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Client:
Atlas Planning

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Executive Summary

Ecosupport Ltd was instructed by Atlas Planning Group to undertake a Preliminary Ecological Appraisal (PEA) of Shrewton Lodge Farm, Shrewton. This was required in order to identify any potentially important ecological features that may be affected by the proposed development. As part of this assessment, the following surveys were undertaken:

- Desktop search for designated sites and protected species within 1 km
- Preliminary Roost Assessment (PRA) of the barn
- Extended Phase I Habitat Survey (also assign UK Habs types) of the area of impact

The following important ecological features were identified on site following the conclusion of the above survey work and may be subject to adverse impacts in the absence of suitable mitigation / compensation:

- Low potential for roosting bats (no further survey work recommended - see **Table 2** & section **6.2**)
- Potential for foraging and commuting badgers
- Confirmed presence of nesting birds
- Nutrient inputs into River Avon

In the absence of any mitigation measures, the proposed development is anticipated to result in no ***adverse impacts*** to bats. Suitable mitigation measures will be outlined within the report with reference to the other ecological features identified.

1.0 INTRODUCTION

1.1 Brief

Ecosupport Ltd was instructed by Atlas Planning Group to undertake a Preliminary Ecological Appraisal (PEA) of Shrewton Lodge Farm, Shrewton (here after referred to as 'the site'). The purpose of this survey was to assess any ecological impacts that may arise as a result of the proposed development. The objectives of the survey were as follows:

- Identify and classify any priority habitats;
- Assess the ecological value of the site;
- Identify any signs of protected species and potential features that may support them
- Make recommendations for further survey work as necessary;
- Make recommendations for any necessary ecological avoidance and mitigation where possible at PEA stage.

NB: If the works do not take place within 18 months of this report[1] then the findings of this survey will no longer be considered valid and may require updating.

1.2 Site Description & Location

The barn is contained within a plot along with a dwelling, stables, additional barns and associated land located at London Road, Shrewton, Wiltshire, SP3 4DP (centred on OS grid reference SU 08125 45156) (**Fig 1**). The north is bounded by residential dwellings and associated land, the east is bounded by agricultural land, the west by another barn and to the south is bounded by stables. In the wider landscape, it is largely rural with surrounding agricultural fields and scattered residential dwellings.

[1] https://cieem.net/wp-content/uploads/2019/04/Advice-Note.pdf

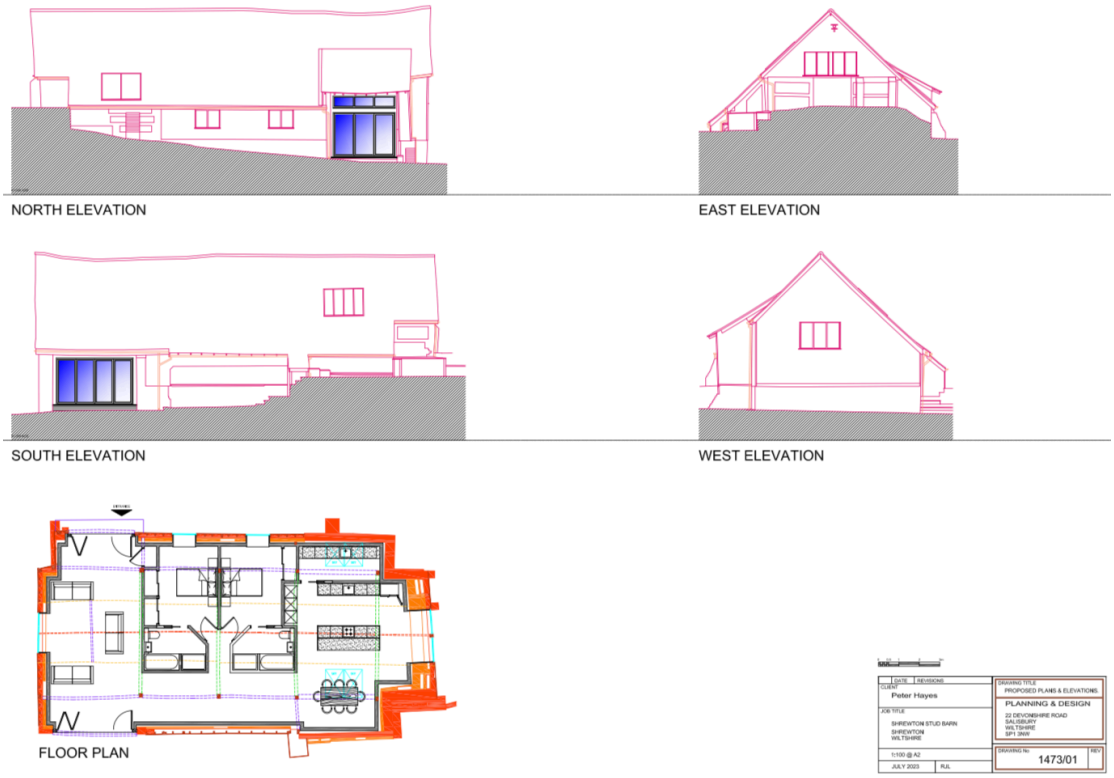
Figure 1. Approximate redline boundary of the site (the impacted area).



1.3 Proposed Development

Current proposals include the conversion of the barn into a residential dwelling (**Fig 2**). The conversion will involve changes to the internals of the building only with all external features retained. None of the adjacent buildings are to be impacted by proposals.

Figure 2. View of the proposed plans (Atlas Planning Group, 2023)



2.0 RELEVANT LEGISLATION AND POLICY

2.1 Legislation

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

The Conservation of Habitats and Species Regulations 2017 transposes the EU Habitats Directive (Council Directive 92/43/EEC) into UK domestic law. It provides protection for sites and species deemed to be of conservation importance across Europe. It is an offence to deliberately capture, kill or injure species listed in Schedule 2 or to damage or destroy their breeding sites or shelter. It is also illegal to deliberately disturb these species in such a way that is likely to significantly impact on the local distribution or abundance or affect their ability to survive, breed and rear or nurture their young.

The Conservation of Habitats and Species Regulations 2019 (EU Exit) makes changes to the three existing instruments which transpose the Habitats and Wild Birds Directives so that they continue to work (are operable) upon the UK's exit from the European Union (EU). These include The Conservation of Habitats and Species Regulations 2017 and The Conservation of Offshore Marine Habitats and Species Regulations 2017. This instrument also amends section 27 of the Wildlife and Countryside Act 1981 to ensure existing protections continue. The intention is to ensure habitat and species protection and standards as set out under the Nature Directives are implemented in the same way or an equivalent way when the UK exits the EU.

In order for activities that would be likely to result in a breach of species protection under the regulations to legally take place, a European Protected Species (EPS) licence must first be obtained from Natural England.

2.1.2 The Wildlife and Countryside Act (1981) (as amended)

This is the primary piece of legislation by which biodiversity if protected within the UK. Protected fauna and flora are listed under Schedules 1, 5 and 8 of the Act. They include all species of bats, making it an offence to intentionally or recklessly disturb any bat whilst it is occupying a roost or to intentionally or recklessly obstruct access to a bat roost. Similarly, this Act makes it an offence to kill or injure any species of British reptiles and also makes it an offence to intentionally kill, injure or take any wild bird or to take, damage or destroy their eggs and nests (whilst in use or being built).

The Wildlife & Countryside Act (1981) states that it is an offence to 'plant or otherwise cause to grow in the wild' any plant listed in Schedule 9 art II of the Act. This list over 30 plants including Japanese Knotweed (*Fallopia japonica*), Giant Hogweed (*Heracleum mantegazzianum*) and Parrots Feather (*Myriophyllum aquaticum*).

2.1.3 The Countryside and Rights of Way Act (2000)

This Act strengthens the Wildlife & Countryside Act by the addition of "reckless" offences in certain circumstances, such as where there is the likelihood of protected species being present. The Act places a duty on Government Ministers and Departments to conserve biological diversity and provides police with stronger powers relating to wildlife crimes.

2.1.4 Natural Environment and Rural Communities Act (2006)

The Natural Environment and Rural Communities (NERC) Act 2006 requires that public bodies have due regard to the conservation of biodiversity. This means that Planning authorities must consider biodiversity when planning or undertaking activities. Section 41 of the Act lists species found in England which were identified as requiring action under the UK Biodiversity Action Plan and which continue to be regarded as conservation priorities under the *UK Post – 2010 Biodiversity Framework.*

2.1.5 Protection of Badgers Act

The Protection of Badgers Act (1992) relates to the welfare of Badgers (*Meles meles*) as opposed to nature conservation considerations. The Act prevents:

- The wilful killing, injury, ill treatment or taking of Badgers and / or
- Interference with a Badger sett
- Damaging or destroying all or part of a sett
- Causing a dog to enter a set and
- Disturbing a Badger while it is occupying a sett

Provisions are included within the Act to allow for the lawful licensing of certain activities that would otherwise constitute an offence under the Act.

2.1.6 The Environment Act (2021)

The Environment Act 2021 is the UK's new legislation for environmental protection in the UK, which includes protection of water quality, clean air, and biodiversity among other key protections. This Act provides the government power to set targets to reach long-term aims relating to the environment, which will be periodically reviewed and updated. This legislation also establishes a new environmental watchdog organisation, the Office for Environmental Protection (OEP), which will hold the government accountable on environmental issues.

Part 6 of The Environment Act relates to nature and biodiversity. This section makes provision for biodiversity net gain to be a condition of planning permission in England and a requirement for nationally significant infrastructure projects. Biodiversity net gain will require maintenance for a period of at least 30 years after the completion of enhancement works to be achieved.

The legislation also includes updates to existing environmental legislation, such as the NERC Act 2006, to strengthen biodiversity enhancement rather than just conservation and includes a requirement for local, or relevant, authorities to publish biodiversity reports. Further, The Environment Act places a requirement on responsible authorities to prepare local nature recovery strategies, which will outline nature conservation sites and priorities and opportunities for recovering or enhancing biodiversity within the local area. Within England, the legislation also provides Natural England with the power to publish 'species conservation strategies' and 'protected site strategies' to identify activities that may affect a species or site's status and outline their opinions on measures that would be appropriate to avoid, mitigate or compensate any adverse impacts.

2.2 Policy

2.2.1 National Planning Policy Framework (NPPF) 2023

The National Planning Policy Framework (NPPF) (2023) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced.

Chapter 15 'Conserving and enhancing the natural environment' states that planning policies and decisions should contribute to and enhance the natural and local environment by protecting and enhancing sites of biodiversity, the wider benefits from natural capital and ecosystem services, minimising impacts on and providing net gains for biodiversity.

The NPPF states that plans should distinguish between the hierarchy of international, national and locally designated sites and that the scale and extent of development within all these designated areas should be limited, while development within their setting should be sensitively located and designed to avoid or minimise adverse impacts on the designated areas.

To protect and enhance biodiversity plans should:
-identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity, wildlife corridors and stepping stones that connect them and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation;
-and promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species and identify and pursue opportunities for securing measurable net gains for biodiversity.

The NPPF states determining planning applications, local planning authorities should apply the following principles:
a) if significant harm to biodiversity resulting from a development cannot be avoided (through locating on an alternative site with less harmful impacts), adequately mitigated, or, as a last resort, compensated for, then planning permission should be refused;
b) development on land within or outside a SSSI, and which is likely to have an adverse effect on it (either individually or in combination with other developments), should not normally be permitted. The only exception is where the benefits of the development in the location proposed clearly outweigh both its likely impact on the features of the site that make it of special scientific interest, and any broader impacts on the national network of SSSI;
c) development resulting in the loss or deterioration of irreplaceable habitats (such as ancient woodland and ancient or veteran trees) should be refused, unless there are wholly exceptional reasons and a suitable compensation strategy exists;
d) development whose primary objective is to conserve or enhance biodiversity should be supported; while opportunities to improve biodiversity in and around developments should be integrated as part of their design, especially where this can secure measurable net gains for biodiversity or enhance public access to nature where this is appropriate.

Department for Levelling Up, Housing and Communities (2023) 'National Planning Policy Framework' (NPPF).

2.2.2 Local – Wiltshire Council

On a local scale, the site falls within the jurisdiction of Wiltshire Council. Core Policy 50 (Biodiversity and geodiversity) of the Wiltshire Core Strategy is divided into three main sections:

Protection:

Development proposals must demonstrate how they protect features of nature conservation value as part of the design rationale. There is an expectation that such features shall be retained, buffered, and managed favourably in order to maintain their ecological value, connectivity and functionality in the long-term. Where it has been demonstrated that such features cannot be retained, removal or damage shall only be acceptable in circumstances where the anticipated ecological impacts have been mitigated as far as possible and appropriate compensatory measures can be secured to ensure no net loss of the local biodiversity resource, and secure the integrity of local ecological networks and provision of ecosystem services.

All development proposals shall incorporate appropriate measures to avoid and reduce disturbance of sensitive wildlife species and habitats throughout the lifetime of the development. Any development potentially affecting a Natura 2000 site must provide avoidance measures in accordance with the strategic plans or guidance set out in published guidance (for example The Stone Curlew Management Strategy – applicable to residential development within distances up to 15km of Salisbury Plain - Wiltshire Bats SAC Planning Guidance – applicable to all development types in the areas within and surrounding Bradford on Avon, Box, Colerne, Corsham, Trowbridge, Westbury, Fonthill and Chilmark - and River Avon Planning Guidance – applicable to any new development in proximity to the Salisbury Avon, or major development within the wider catchment) where possible, otherwise bespoke measures must be provided to demonstrate that the proposals would have no adverse effect upon the Natura 2000 network. Any development that would have an adverse effect on the integrity of a European nature conservation site will not be in accordance with the Core Strategy.

Biodiversity Enhancement:

All development should seek opportunities to enhance biodiversity. Major development in particular must include measures to deliver biodiversity gains through opportunities to restore, enhance and create valuable habitats, ecological networks and ecosystem services. Such enhancement measures will contribute to the objectives and targets of the Biodiversity Action Plan (BAP) or River Basin/ Catchment Management Plan, particularly through landscape scale projects, and be relevant to the local landscape character. Local sites Sustainable development will avoid direct and indirect impacts upon local sites through sensitive site location and layout, and by maintaining sufficient buffers and ecological connectivity with the wider environment. Damage or disturbance to local sites will generally be unacceptable, other than in exceptional circumstances where it has been demonstrated that such impacts:

i. cannot reasonably be avoided;
ii. are reduced as far as possible;
iii. are outweighed by other planning considerations in the public interest;
iv. where appropriate compensation measures can be secured through planning obligations or agreements.

Development proposals affecting local sites must make a reasonable contribution to their favourable management in the long-term.

A further policy, Policy 69, within the core strategy provides protection for the River Avon SAC. In order to avoid and reduce potential environmental effects on the River Avon SAC, development will need to incorporate measures during construction and operation to avoid and prevent pollution and mitigate potential disturbance effects; appropriate measures may include consideration of suitable buffer zones along watercourses, habitat enhancements and river access management measures. All development within 20m of the river banks should submit a construction management plan to the local planning authority to ensure measures proposed during construction are satisfactory. Where additional sewage discharges to a STW cannot be accommodated without measures to offset phosphate loading, development will be required to undertake proportionate measures (which may include contributions towards those measures identified in the Nutrient Management Plan) to demonstrate that the proposals would have no adverse effects upon the SAC.

3.0 METHODOLOGY

3.1 Desk Study

3.1.1 Waterbodies

Any ponds located within 250m of the proposed development were searched for using Ordnance Survey maps and available aerial images.

3.1.2 Designated sites

A search for designated sites within 1km of the site was undertaken using freely available online resources.

3.2 Field Survey

3.2.1 Habitats

The field survey work which forms the basis of the findings of this report was carried out by Katalin Balazs BSc (Hons) MSc, ecologist with Ecosupport, on the 18th April 2023. Weather conditions during the survey comprised temperatures of 14 ^{o}C and partly clouded.

Habitats on site pre-development were identified in accordance with the categories specified for a UK Habitats survey, using Habitat Definitions Version 2.0 (UKHab Ltd., 2023). This was chosen as an appropriate habitat categorisation system as it fits within the Biodiversity Metric 3.1 calculation. Where appropriate primary habitat codes were used although for some habitat types, the use of secondary habitat codes was necessary as well.

3.2.2 Badger

The site was thoroughly searched for evidence of use by Badgers (*Meles meles*), with the specific aim of identifying the presence and location of any setts. In accordance with the *Badgers and Development: A Guide to Best Practice and Licensing* (Natural England, 2011) guidance, the survey accounted for a 30m from the site's boundary (observed where possible i.e. does not conflict with private dwellings). Evidence of Badgers could include latrines, dung pits, feeding remains and foraging evidence, trails and setts.

3.2.3 Bats

An assessment was made of the suitability of the buildings on site to support roosting bats based on the presence of any Potential Roost Features (PRFs) during March 2023. This involved the use of 8 x 42 close focus binoculars and a high-powered torch (where required) for a more detailed inspection of any features. The survey conformed to current best practice guidance as described in Bat *Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016) and was conducted by Katalin Balazs BSc (Hons) MSc.

Table 1. Guidelines for assessing the potential suitability of a built structure for roosting bats (reproduced from BCT (Collins (ed) 2016)).

Suitability	Description of Roosting Habitats
Negligible	Negligible habitat features on site are likely to be used by roosting bats
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[2] and/or suitable surrounding habitat to be used on a regular basis or by a large number of bats (i.e. unlikely to be suitable for maternity or hibernation).
Moderate	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High	A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

3.3 Assessment Methodology

3.3.1 Introduction

The methodology for the assessment of the likely ecological effects of the proposed development is based on CIEEM's *Guidelines for Ecological Assessment in the UK* (CIEEM 2018). Although this assessment does not constitute a formal Ecological/ Environmental Impact Assessment, the CIEEM guidelines provide a useful framework for assessing ecological impacts at any level.

3.3.2 Valuation

Features of ecological interest are valued on a geographic scale. Value is assigned on the basis of legal protection, national and local biodiversity policy and cultural and/or social significance.

3.4 Limitations

3.4.1 Habitats

There were not considered to be any significant limitations on the results of the habitat survey with all areas of the site accessible and the survey conducted at a suitable time of year for vascular flowering plants. This survey does not constitute a full site assessment for invasive plant species such as Japanese Knotweed (*Fallopia japonica*).

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

4.0 ECOLOGICAL BASELINE

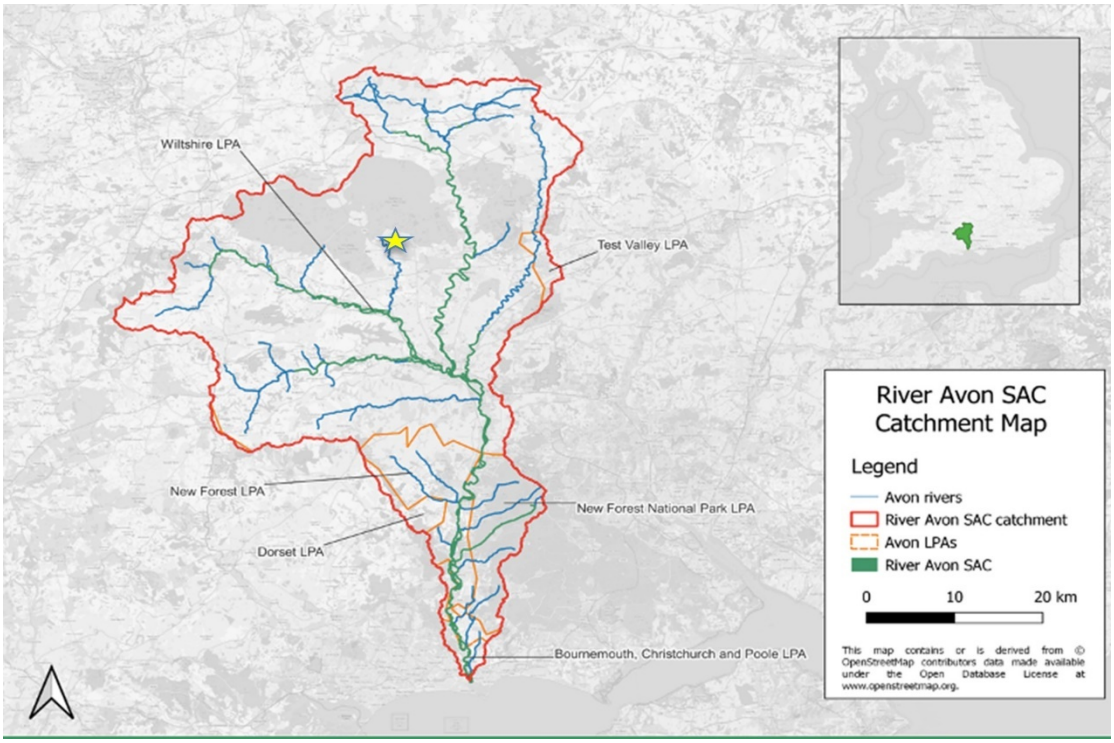
4.1 Waterbodies

There were no waterbodies recorded within 250m of the site.

4.2 Designated Sites

No designated sites identified within 1km of the site. However, the site does lie within the River Avon SAC catchment area (**Fig 3**).

Figure 3. River Avon SAC Catchment with approximate site location indicated by the yellow star (Natural England, 2022).



4.3 Vegetation Survey Results

The vegetation within the site has been described below using the UK Habs Habitat Definitions Version 2.0 (UKHab Ltd., 2023). The below species noted should not be considered an exhaustive list and instead refer to dominant, characteristic and other noteworthy species associated with each community within the survey area. The habitat types on site comprise:

- Modified grassland (g4) *with secondary code(s) (81) ruderal /ephemeral*
- Developed land; sealed surface (u1b)
- Buildings (u1b5)

4.3.1 Modified grassland (g4) with Ruderal (secondary code: 81)

Modified grassland with ruderal (81) was present as a small patch at the north-east corner of the site (**Fig 4**). Species recorded include the following: Cleavers (*Galium aparine*), Cow parsley (*Anthriscus sylvestris*), Dandelion (*Taraxacum officinalis*), Hogweed (*Heracleum sphondylium*), Ivy (*Hedera helix*), Lords and Ladies (*Arum maculatum*), Nettle (*Urtica dioica*), Nipplewort (*Lapsana communis*) and Silverweed (*Argentina anserina*).

Figure 4. View of the modified grassland present at the north-eastern corner of the barn (taken April 2023).



4.3.2 Developed land; sealed surface (u1b)

Developed land; sealed surface was present around the barn in the form of concrete hardstanding and gravel (**Fig 5**).

Figure 5. View of the developed land; sealed surface at the northern side of the barn (taken April 2023).



4.3.3 Buildings (u1b5)

The final habitat type on site was the barn with further descriptions provided in **Table 2** below.

4.4 Bat Survey Results

4.4.1 Buildings

The findings of the preliminary roost assessment of the barn are outlined in **Table 2** below.

Table 2. Results of the preliminary roost assessment undertaken of the barn on site.

Building	Figure	Description of Construction	PRFs / Evidence of Occupation	Assessed Roost Potential
Shrewton Lodge Farm barn	**Figure 6.** External view of the northern elevation of Shrewton Lodge Farm barn (taken April 2023).  **Figure 7.** Gaps present underneath lifted roof tiles (taken April 2023). 	The barn was of red and concrete brick construction with wooden cladding and a clay cut tiled roof. There were also present two skylights with lead flashing (**Fig 6**). The barn has open access on both the northern and southern elevation. Internally, the roof void was of a typical wooden truss design with no internal lining (**Fig 8**).	Externally, superficial gaps were present between wooden cladding and roof tiles on the northern and southern elevations (**Fig 7**) which provided access into the internals of the structure. Due to the lack of lining or cavity wall within the barn, the gaps were visible from the inside of the barn (**Fig 9**). Due to this, the externals PRFs are not considered to provide suitable internal roosting opportunities. In addition, high levels of light were present within the barn from the two barn windows (**Fig 8**). The barn is also	***Low Potential***

	Figure 8. Internal view of the roof tiles (taken April 2023).  **Figure 9.** External gaps in the roof tiles visible inside the barn (taken April 2023). 		considered unlikely to maintain suitable internal temperatures due to the lack of lining. No evidence or signs of use by roosting bats was identified internally.	

4.5 Badgers

During the walkover no evidence of badgers was noted on site. Notwithstanding this, the site supports grassland with connectivity to additional foraging habitat at the western boundary, therefore the site supports ***potential*** for foraging and commuting badgers.

4.6 Breeding and Nesting Birds

During the site assessment the barn was found to support a number of active birds nests (**Fig 10**). On the wider site, there are no habitats to be impacted that provide potential for breeding and nesting birds. The site therefore supports ***Confirmed presence*** of breeding and nesting birds.

Figure 10. Bird's nest found within barn (taken April 2023).



5.0 LIKELY ECOLOGICAL IMPACTS IN ABSENCE OF MITIGATION

5.1 Introduction

The CIEEM guidelines (CIEEM 2018) require that the potential impacts of the proposals should be considered in absence of mitigation. In order for a significant adverse effect to occur, the feature being affected must be at least of local value. However, in some cases, features of less than local value may be protected by legislation and/or policy and these are also considered within the assessment. Although significant effects may be identified at this stage of the assessment, it is often possible to provide appropriate mitigation.

5.2 Site Preparation and Construction

5.2.1 Impacts to Habitats

It is assumed that the proposals will involve the conversion of the barn which is only considered to be of value at the ***Site*** level of significance.

5.2.2 Impacts to Wildlife

The barn has been identified as supporting low potential for roosting bats. Due to the fact that the external features will not be impacted by the conversion of the barn, an ***adverse impact*** to roosting bats ***is unlikely***.

The proposed works may require the creation of some excavations. This may lead to Badgers and other mammals becoming trapped or injured during the works. Therefore, in the absence of mitigation an ***adverse impact is possible*** at the ***Local level***.

The works will result in the removal of the roof of the barn. In the absence of mitigation this could lead to the disturbance of nesting birds and damage to their nests. Therefore, an ***adverse impact is possible*** at the ***Local level***.

5.3 Site Operation

5.3.1 Impacts to Wildlife

The development may result in an increase in lighting within the general area from any additional external lights on the new dwelling. This can affect the behaviour, particularly foraging, of nocturnal wildlife. Therefore, an ***adverse impact is likely*** on bats, badger, and other nocturnal wildlife (i.e hedgehogs).

5.3.2 Impacts to Designated Sites

Due to the addition of 1 dwelling, the site will result in an increase in phosphorus input into the WwTW which lies within the Wiltshire watershed draining into the Avon. Natural England has stated there is uncertainty as to whether new growth will further deteriorate designated sites due to an increase in nutrient inputs from wastewater. Therefore, ***an adverse impact is possible*** on the Avon SAC, a ***site of international significance***.

6.0 RECOMMENDATIONS

6.1 Introduction

The below sections outline a number of recommendations for further survey work required to fully assess the potential ecological impacts of the development and ensure and proposed mitigation and compensation appropriate and proportionate. In addition to this, measures are outlined to protect the existing features of value and provide enhancements post development.

6.2 Bats

6.2.1 Roosting Bats

Although the barn was considered to support low potential for roosting bats, the external features identified will not be impacted by the development will be retained entirely. Therefore, no further survey work in regards to bats is considered necessary, however the following precautionary approach will be adopted.

6.2.1.1 Supervision

Prior to any works commencing, an Ecologist will carry out an updated search of the internals structure to establish whether any bats are in residence. The ecologist will give a Toolbox talk which will detail best practice methods of sensitive stripping/removal of roofing tiles/materials and identifying signs of bats. Personnel will be educated on signs of bats and that in the unlikely event a bat is found, all works should stop immediately.

If a bat roost is identified within the barn, any works that impact upon a bat roosts will need to take place under an EPSL obtained from Natural England and under the supervision of a Licensed Ecologist. Destruction of the roosts and capture of bats (if required) will need to be carried out under the supervision of a licensed ecologist. All works would be detailed within the EPSL Method Statement required as part of the licence application with the main principles of this outlined in the below sections.

6.2.1.2 Sensitive Stripping Method

Scaffolding will be put in place to facilitate the removal of tiles, if needed, by hand. Tiles will be removed via sensitive methods by the licensed ecologist with help from the contractors.

6.2.2 Use of Roofing Felt

Bitumen roofing felt must be utilised as opposed to Breathable Roof Membrane (BRM) as there is evidence to suggest that BRM poses a threat to bats occupying a structure due to entanglement in the fibres (Natural England, 2015). Any new roof underlining associated with the new building will include bitumen roofing felt as opposed to BRM or other fibrous materials, as a precautionary measure. This is particularly important as bat access tiles are being proposed.

6.2.3 Sensitive Lighting

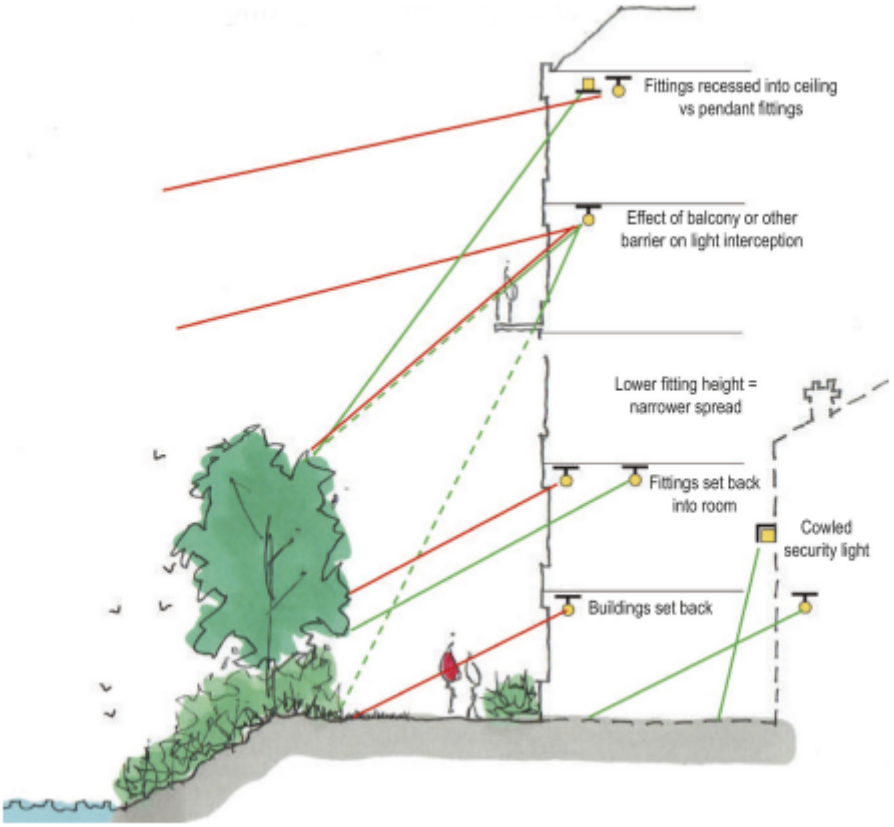
The development may result in an increase in lighting from the newly built dwelling, as such it is recommended that if any new lighting is added or the lighting used during construction, complies with the following document (*Guidance Note 08/23 Bats and Artificial Lighting at night*) produced via a collaboration between the Institute of Lighting Professionals (ILP) and the Bat Conservation Trust (BCT). This document outlines the latest recommendations to minimise the impacts of increased artificial lighting on bats. The key recommendations within this document have been outlined below and will be implemented as far as is practicable.

'Light sources, lamps, LEDs and their fittings come in a myriad of different specifications which a lighting professional can help to select. However, the following should be considered when choosing luminaires and their potential impact on Key Habitats and features:

- *All luminaires will lack UV elements when manufactured. Metal halide, compact fluorescent sources should not be used*
- *LED luminaires will be used where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability*
- *A warm white light source (2700Kelvin or lower) will be adopted to reduce blue light component*
- *Light sources will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats (Stone, 2012)*
- *Internal luminaires can be recessed (as opposed to using a pendant fitting - See **Fig 11**) where installed in proximity to windows to reduce glare and light spill*
- *Waymarking inground markers (low output with cowls or similar to minimise upward light spill) to delineate path edges (see Case Study 1)*
- *Column heights will be carefully considered to minimise light spill and glare visibility. This should be balanced with the potential for increased numbers of columns and upward light reflectance as with bollards*
- *Only luminaires with a negligible or zero Upward Light Ratio, and with good optical control, should be considered - See ILP GN01*
- *Luminaires will always be mounted horizontally, with no light output above 90° and/or no upward tilt*
- *Where appropriate, external security lighting will be set on motion sensors and set to as short a possible a timer as the risk assessment will allow. For most general residential purposes, a 1 or 2 minute timer is likely to be appropriate*
- *Use of a Central Management System (CMS) with additional web-enabled devices to light on demand Use of motion sensors for local authority street lighting may not be feasible unless the authority has the potential for smart metering through a CMS*
- *The use of bollard or low-level downward-directional luminaires is strongly discouraged. This is due to a considerable range of issues, such as unacceptable glare, poor illumination efficiency, unacceptable upward light output, increased upward light scatter from surfaces and poor facial recognition which makes them unsuitable for most sites. Therefore, they should only be considered in specific cases where the lighting professional and project manager are able to resolve these issues. See Case Study 6*

Only if all other options have been explored, accessories such as baffles, hoods or louvres can be used to reduce light spill and direct it only to where it is needed. However, due to the lensing and fine cut-off control of the beam inherent in modern LED luminaires, the effect of cowls and baffles is often far less than anticipated and so should not be relied upon solely'.

Figure 11. Internal lighting mitigation options (ILP 2023)



6.3 Badgers

During the construction phase, any open excavations left overnight should either be covered to prevent commuting Badgers falling in or escape ladders should be used to prevent them from becoming trapped. Any open pipework should be checked and then capped nightly.

6.4 Breeding and Nesting Birds

6.4.1 Timing

In order to avoid disturbance of nesting birds or damage to their nests, any works impacting the barn will be undertaken outside of the bird-nesting season (typically March – September, dependant on weather). If this is not possible, the barn should be thoroughly checked by an ecologist immediately prior to demolition. If any active nests are found, they should be left undisturbed with a 5m buffer erected (barrier tape or similar) and monitored until the chicks have fledged.

6.5 River Avon SAC

The site is likely to result in an increase in phosphorus run-off to the River Avon SAC through added waste to the wastewater treatment works due to the addition of a new dwelling. Natural England has laid out guidance for calculating and mitigating any increased phosphorus

from new development (Natural England, 2020). A phosphorus budget calculation will be completed to measure the amount of increased phosphorus from the development and mitigation will be required to offset this.

6.6 Enhancements

6.6.1 Bats

As a general biodiversity enhancement, 2 General Purpose Bat Box will be erected on two mature trees at a minimum height of 4-5 metres from the ground. These will provide future roosting opportunities for bats in the area.

6.6.2 Birds

As a general enhancement and to compensate for the loss of nesting areas in the existing barn, four bird boxes will be installed onto mature trees within the wider site. Boxes which provide long term nesting opportunities such as two Vivara Pro Seville 28mm Woodstone Nest Box and two Vivara Pro Seville Woodstone Nest Box with 32mm Oval Hole (**Fig 12**).

Figure 12. Vivara Pro Seville 28mm WoodStone Nest Box (left) and Vivara Pro Seville WoodStone Nest Box with 32mm Oval Hole (right) which will be installed on trees on site. (NHBS, 2023)



7.0 REFERENCES

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