

ECOLOGICAL APPRAISAL AND BAT ROOST ASSESSMENT

Black Barn, Old Hall Farm, Haughley Green, Stowmarket, Suffolk, IP14 3RR



Prepared by James Hodson MSc
Trading as 'Eco-Check Ltd'
White House Cottage
Knapton Green
Norfolk
NR28 0RU

Copyright Eco-Check Ltd. All rights reserved. No part of this report may be copied or reproduced by any means without prior written permission from Eco-Check Ltd. If you have received this report in error, please destroy all copies in your possession or control. This report has been prepared for the exclusive use of the commissioning party and unless otherwise agreed in writing by Eco Check Ltd, no other party may use, make use of or rely on the contents of this report. No liability is accepted by Eco-Check Ltd for any use of this report, other than for the purposes for which it was originally prepared and provided.

Opinions and information provided in the report are on the basis of Eco-Check Ltd using due skill, care and diligence in the preparation of the same and no warranty is provided as to their accuracy. Surveys are undertaken on the understanding that nothing in the final report will be omitted, amended or misrepresented by the client or any other interested party. This report and its contents remain the property of Eco-Check Ltd until payment has been made in full. It should be noted and it is expressly stated that no independent verification of any of the documents or information supplied to Eco-Check Ltd has been made.

Report produced by:	Commissioned for:
Eco-Check Consultancy Ltd, White House Cottage Knapton Green Norfolk NR28 0RU	Acorus Rural Property Services Ltd. Old Market Office 10 Risbygate Street Bury St Edmunds Suffolk IP33 3AA
Tel: [REDACTED]	Louise Gregory
[REDACTED]	[REDACTED]
Author: James Hodson	Date: 4 th December 2023
Reviewed by: Cherece Snook	Date: 5 th December 2023

1. Executive Summary	3
2. Introduction	5
2.1. Purpose of Survey.....	5
2.2. Site Location.....	5
2.3. Proposed Works.....	5
2.4. Building Descriptions.....	7
3. Methods	9
3.1. Desk Study	9
3.2. Preliminary Bat Roost Assessment (PRA).....	9
3.3. Tree Roost Assessment	10
3.4. Bat Roost Assessment.....	10
3.5. Legislation.....	10
4. Survey Results	12
4.1. Desk Study	12
4.2. Habitats	15
4.3. Protected/Priority Species.....	15
4.4. Bat Roost Assessment.....	15
5. Constraints.....	17
5.1. Desk Study	17
5.2. Building Survey	17
6. Evaluation and Recommendations	18
6.1. Bat Species	18
6.2. Bird Species	19
6.3. Amphibian and Reptile Species	19
6.4. Small mammals.....	19
6.4. Designated Sites and Habitats.....	19
7. Mitigation.....	20
8. Recommendations for Further Surveys	21
9. References	21
Appendix 1 - Site Plans.....	22
Appendix 2- Desk Study Data	25

1. Executive Summary

The following summary is an extract of the report. Please ensure the report is read in its entirety for detailed survey findings and recommendations:

SUMMARY	
Introduction	Eco-Check was commissioned by Acorus Rural Property Services to undertake a Preliminary Bat Roost and Bird Nest Assessment of a timber frame and corrugated tin sheet agricultural barn (B1), an adjoining concrete block and fiberboard store (B2) and a brick and clay lump wood store with fiberboard roof (B3). A planning application is submitted to Mid-Suffolk District Council for the conversion of the buildings to create a single residential unit.
Methodology	<p>Desk Study: A desk study was undertaken to obtain and review records of protected and priority species within 2 km of the site. The respective search radius was also considered suitable for obtaining background information on bat and bird species diversity and the occurrence of [recorded] bat roosts within the wider environs of the site.</p> <p>Preliminary Roost Assessment (PRA): A bat roost assessment was undertaken by James Hodson BSc, MSc (Natural England, Level 2 Bat Survey License 2017-30927-CLS-CLS) on 24th October 2023 searching for roost features, actual roosting bats and signs of past usage. The structural design and condition of the buildings was also noted within the PRA to assess the structural potential for different sorts of roosts. A check for nesting birds was also undertaken and a great crested newt scoping survey of an adjacent pond P1.</p>
Results	<p>Desk Study: The local records have identified no records of rare or protected species on the proposed development site or any of the adjacent land. A record search identified that there were 4 species of bat recorded within 2km of the site. There are no records of any European Protected Species Mitigation Licenses (EPSML) for bats or other species within 2km of the site. There are no statutory or non-statutory sites located within 2km and the site sits outside of any SSSI Impact Risk Zones (IRZ).</p> <p>PRA: A detailed search of the exterior of the buildings and floor found no bat droppings or other evidence of bat activity. An internal inspection of the buildings, wall tops, floors and flat surfaces found no evidence of bat use. A search of the door and roof frames similarly did not find any urine stains, bat droppings or other evidence of bat roosts. The main barn (B1) contains no potential roosting features (PRFs) and is draughty and subject to wide temperature fluctuations. The concrete block extension (B2) is well pointed, and the timber frame and corrugated fiberboard roof has no PRFs. The wood store (B3) brick and block construction is well pointed and with evidence of repairs to the clay lump wall sections. The corrugated fiberboard roof and frame lacks any PRFs, although has a fairly dark and sheltered ridge board.</p> <p>The buildings are all considered to lack sufficient access, protection and/or appropriate thermal conditions to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation). The buildings are therefore assessed as having Negligible probability of bat interest due to the lack of any evidence of bat roosts, general lack of potential roost features (PRFs) and suboptimal roosting conditions.</p>
Other Species	There is small pond P1 located approximately 90m south of the buildings which is located within a small area of set-aside bordering arable fields. The pond is heavily

	<p>overgrown with common reed <i>Phragmites australis</i> and is also shaded around the margins with overhanging trees. The pond was assessed for its suitability to support the breeding cycle of amphibians and particularly great crested newt <i>Triturus cristatus</i>. The development will not result in the loss of any aquatic habitats and will not have an impact on any aquatic habitats or valuable terrestrial habitats. There are no habitats within or adjacent to the site considered likely to be used by reptiles. An HSI assessment of the pond returned a score of 0.62 which is average potential to support great crested newt. The site is within a Green Impact Risk Zone for great crested newt.</p> <p>Habitats bordering the buildings include arable land, bare ground, scattered trees, bramble scrub and common perennial and ephemeral weed species. Herpetofauna are unlikely to be present within the proposed working areas. The site has potential to support hedgehogs and so any brash or wood piles must be cleared by hand. Breeding birds: Old bird nests were present in both buildings B1 & B3, and the bordering trees, shrubs and scrub also provide nesting opportunities. No evidence of owls was found inside the buildings, and none were observed during the site survey.</p>
Impact Assessment	<p>The impact of the development upon bats roosting is considered to be negligible due to the low likelihood of bats being present. The impact of the development upon bats is considered to be Neutral subject to the reasonable avoidance and mitigation measures being implemented. With respect to the impact on bats, an offence under Article 12 of the European Directive and Regulation 41 of Conservation of Species and Habitats (Amendment EU Exit) Regulations 2019 is unlikely to occur when undertaking the proposed conversion works. The development is not considered to have a significant impact upon commuting or foraging bats and there will be no severing of connectivity.</p> <p>No further roost characterization surveys are recommended due to the lower quality of the PRFs, the lack of bat evidence recorded, and the sub-optimal roosting conditions recorded. Any additional survey effort is considered disproportionate to the risk at hand. A single dusk/dawn survey provides little statistical confidence in roost presence for singleton non-breeding bats, especially pipistrelle bats which switch roosts very frequently. Precautionary mitigation is, therefore, recommended to ensure the proposed conversion works complies with UK and European legislation and does not adversely impact the local bat population.</p>
Recommendations	<ul style="list-style-type: none"> • In the event bats are found during the conversion works, all works must stop immediately and advice sought from a licensed bat ecologist. In such instance, further survey work may be required; • All staff working on site should receive a toolbox talk (TBT) prior to the commencement of works. The TBT will focus on PRFs, protective legislation, risk of bat presence on-site; • In terms of bat activity and disturbance, works should be undertaken during daylight hours (i.e. 07:00 to 19:00) and artificial lighting should be avoided wherever possible. Where this is not possible, light spillage onto any linear features should be avoided by the use of directional lighting (i.e. the use of hoods and / or cowls). • Works should be timed to avoid the active bird nesting season, where possible. If within the nesting season, a suitably qualified Ecological Clerk of Works (ECoW) should be employed to inspect for active bird nests before construction commences. • Biodiversity enhancement will be through the provision of bat and bird boxes on mature trees or the converted buildings. • If development has not commenced within 18 months of October 2023, it is recommended that an updated survey is undertaken, as the suitability of the site for protected species, and in particular bats, may have changed.

2. Introduction

2.1. Purpose of Survey

Eco-Check was commissioned by Acorus Rural Property Services to undertake a Preliminary Bat Roost and Bird Nest Assessment of a timber frame and corrugated tin sheet agricultural barn (B1), an adjoining concrete block and fiberboard store (B2) and a brick and clay lump wood store with fiberboard roof (B3). The buildings subject to this application have been used for the housing of livestock in the past (pigs and chickens) and are currently used as an agricultural workshop and for the storage of machinery, and equipment used on the holding. A Class Q planning application is submitted to Mid-Suffolk District Council for the conversion of the buildings to create a single residential unit.

The survey aims to highlight any evidence of (or potential for) nesting birds, bat roosts or habitats for other protected or priority species that could result in a constraint to the proposed conversion works to the buildings. This report has been prepared in accordance with the recommended format in 'Bat Surveys-Good Practice Guidelines, J. Collins, 3rd Ed, 2023' and 'Bat Workers Manual, 3rd Edition, Mitchell and Jones, 2004'. The methodology of the survey adopts the recommended best working practice for the inspection of buildings for bats and bat roosts.

The overall aim is to ensure the proposed conversion works do not adversely impact the local bat or bird population or other protected species. A desk-based study was performed to check for any records of bat roosts and bat activity within the wider site surrounds. A Preliminary Roost Assessment (PRA) was then undertaken to collate the following information:

- Identify the presence of any roosts or signs of previous bat activity
- Assess the likelihood of the buildings on-site supporting a potential roost (based on the respective architecture and structural condition)
- Determine whether further survey work is required to ascertain the presence / likely absence, size, status and seasonal usage of bat roosts (conforming to best practice survey guidelines [Collins, 2016] and legislative protection)

2.2. Site Location and Description

The site is located approximately 500m north of the village of Haughley Green in the civil parish of Wetherden in the Mid-Suffolk District. The site is approximately 2.5km north of Haughley and 3.7km north-east of Elmswell. The site is accessed off Rectory Road to the south via a farm track, grid reference TM031649 (See Fig 1).

The site comprises a farmhouse and a range of agricultural buildings of mixed age and construction and bordered by hard surfaces and bare ground. Habitats within the site include bare ground, improved grassland, scattered trees, scrub, hedging and ornamental plants and shrubs.

Beyond the immediate site the landscape is entirely large open arable fields and pasture with scattered trees and hedging. There is a drain 70m to the south with running water and which runs adjacent to the off-site pond P1, 90m to the south. The site is considered to be relatively isolated but with some connectivity to the wider landscape along field hedgerows, tree lines, farm tracks and other linear features which are potentially used by commuting and foraging bats.

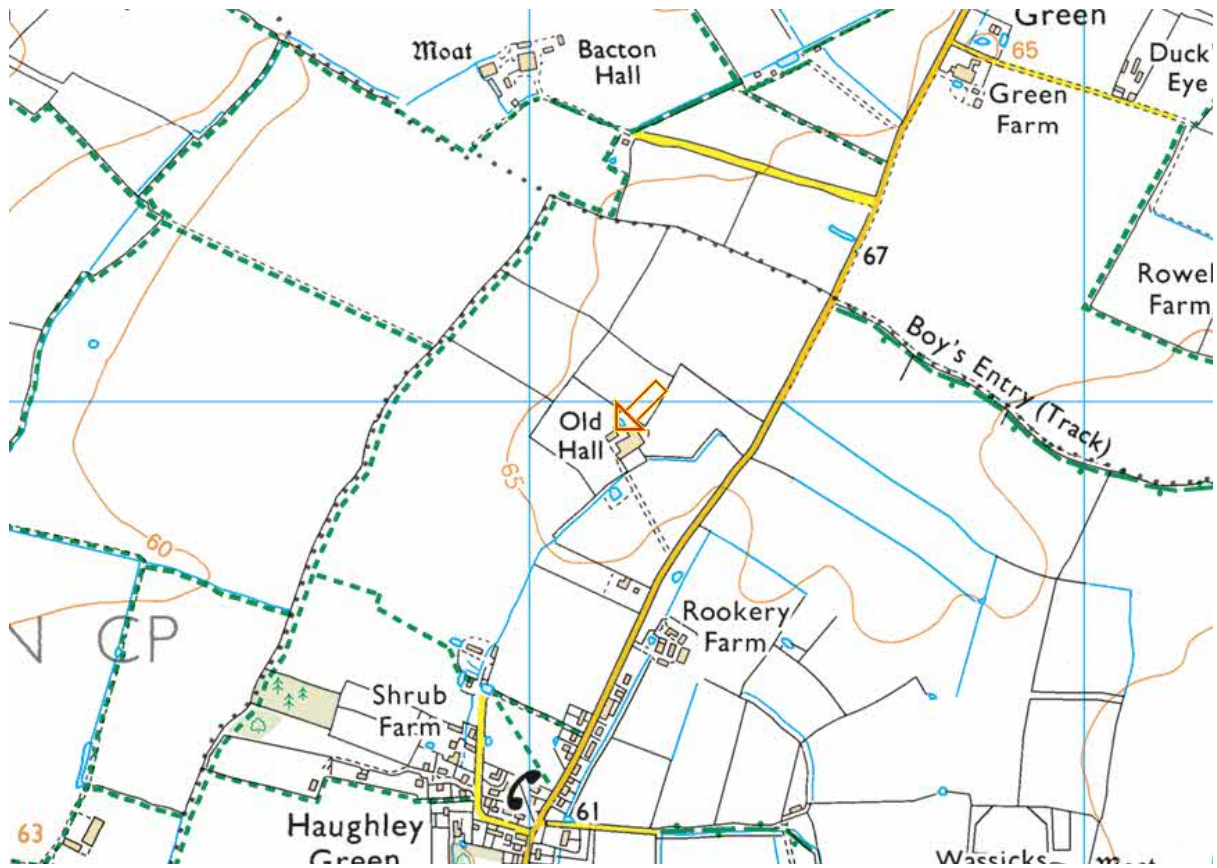


Fig.1- Site Location Map, Streetmap 2023

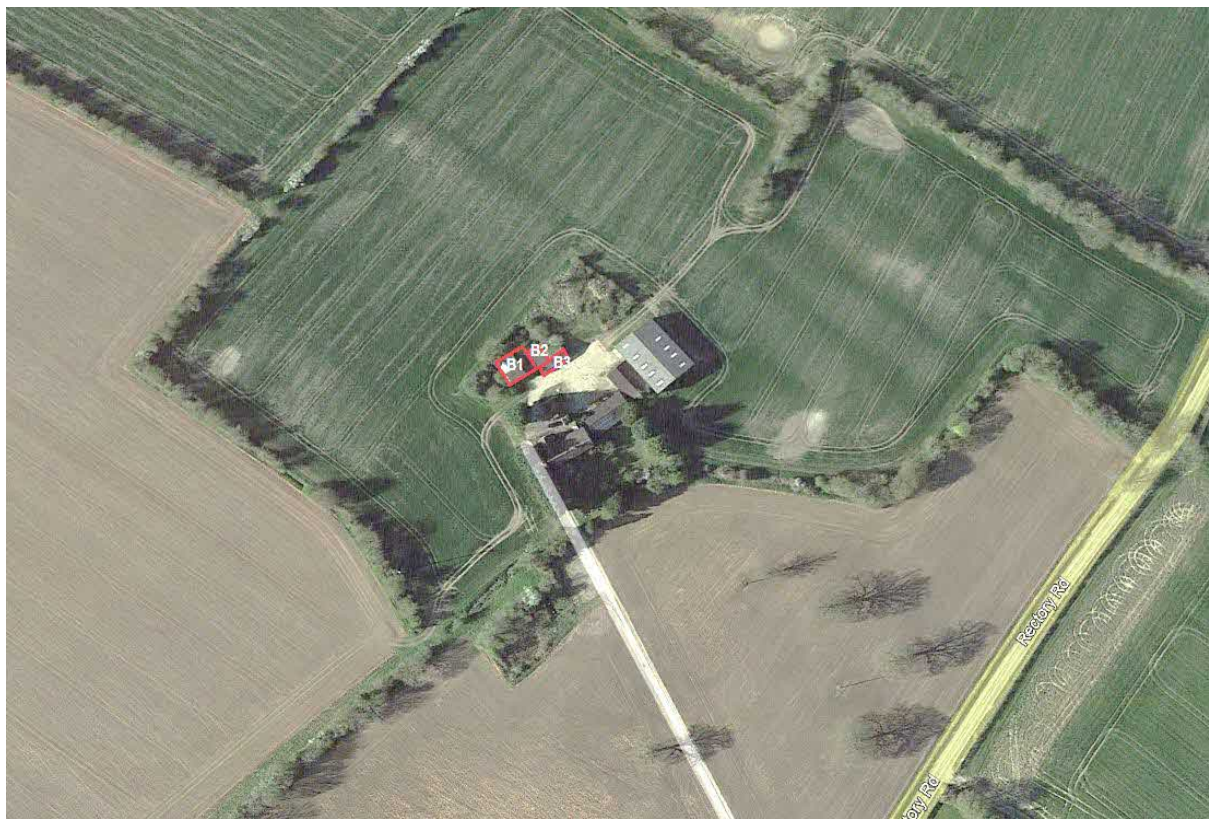


Figure 2. Aerial image of site and buildings proposed for conversion (red), Google Earth, March 2022

2.3. Proposed Works

The design will utilise the existing buildings with retention of the roof and existing walls and externally will look quite similar. Existing metal sheet cladding will be repaired and replaced where necessary. Existing render will be replaced, and concrete blocks painted. Metal sheeting will replace the fiberboard roof on the lean-to. Existing openings will be utilised and modified where necessary with new windows and doors inserted to allow for the building to operate as a dwelling. The existing roof will be insulated internally. No external walls will be constructed. Other than new windows and doors all the other works will be internal, such as insulation and sub dividing the space. See drawings in Appendix 1 for more detail.

2.4. Building Description and Proposed Works

The application includes three adjacent building sections of which buildings B1 and B2 are connected internally. A summary of the construction of the buildings is as follows:

B1: The main agricultural building measures approximately 11m by 10m and is constructed on a concrete block plinth with a timber frame and corrugated tin sheet sides and roof. The floor is concrete and there is a Perspex window and doorway in the east gable. The building was used formerly for livestock and now contains a range of stored items. There are frequent holes in the corrugated tin sheets and vented ridge making the building draughty and subject to wide temperature fluctuations. Whilst there are some small gaps at wall tops and at eaves level providing potential bat access points, the building generally lacks any potential roost features, is subject to disturbance and lack of sufficient shelter, protection and/or appropriate thermal/lighting conditions to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation.). The building was assessed as having Negligible probability of bat interest due to the lack of any evidence of bat activity or roosts, general lack of potential roost features (PRFs) and suboptimal roosting conditions. There were no oil stains, urine stains, droppings or other indications of bat use.



Fig 3 & 4. East elevation (left) and overgrown encroaching west elevation with arable field (right)



Fig 5 & 6. Internal view of west gable (left) and east gable and timber frame (right)

B2: Adjoining the north section of B1 is a lean-to structure which is open internally into the main building. The extension is of concrete block construction with a timber frame supporting a corrugated fiberboard roof and with plastic sheeting hanging beneath. The floors of the building are concrete and un-swept. The building lacks any notable potential roost features and no bat droppings or other evidence as found. The building was therefore assessed to have Negligible roost potential only.



Fig 7 & 8. Well pointed brickwork (left) and roller door access (right)

B3: Adjoining the north section of B2 is a wood-store structure of red brick and clay lump block construction with a corrugated fiberboard roof and no sarking. The floor is unmade and the roof comprises a softwood timber frame supporting corrugated tin sheeting, the north gable end is also corrugated tin. There are gaps at the wall tops and above the timber door on the east elevation and small gaps around the tin sheeting providing access to wildlife. The building lacks any notable potential roost features, and no bat droppings or other evidence was found. The building also has suboptimal thermal/lighting conditions to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation.). The building was therefore assessed to have Negligible roost potential only.



Fig 9 & 10. East elevation with tar coated clay lump (left) and overgrown north gable end (right)



Fig 11 & 12. Internal view of brick, block and clay walls (left) and roof structure (right)

3. Methods

3.1. Desk Study

3.1.1. Designated sites

A desk study search for sites designated for nature conservation importance was undertaken on the Multi-Agency Geographic Information website (www.magic.gov.uk). The search comprised statutory designated sites (e.g. Sites of Special Scientific Interest, SSSIs). A search was also undertaken for non-statutory designations such as County Wildlife Sites (CWSs) or Local Wildlife Sites (LWSs). A search within 2km of the site was undertaken for non-statutory wildlife sites.

3.1.2. Notable species

A desk study for records of relevant bat records within 2km of the site and other protected/priority species was obtained from the NBN Atlas, Magic and previous surveys in the area.

3.2. Preliminary Roost Assessment (PRA)

A licensed bat ecologist undertook a PRA on 24th October 2023 in accordance with best practice guidance (Collins, 2016). The objectives of the survey were to:

- Determine the presence or likely absence of bats;
- Locate any bat roosts and determine the species (where possible);
- Estimate the size of the roost (i.e. small / moderate / large);
- Identify access / egress points to and from potential / confirmed roosts;
- Assess potential flight paths to and from potential / confirmed roosts in terms of the arrangement of current vegetation and lighting layout; and,
- Determine the status and seasonal usage of any bat roosts present.

The survey comprises a systematic search of the exterior or the buildings from ground level to locate confirmed and/or identify potential roosts and access points (where visible), and to locate any evidence of bats such as live or dead specimens, droppings, urine splashes, fur-oil staining and/or squeaking noises.

The external survey focuses upon the ground surrounding Potential Roost Features (PRFs), particularly beneath potential access points, and structural features of interest such as: windowsills, windowpanes, walls, behind peeling paintwork or lifted rendering, hanging tiles, weatherboarding, eaves, soffit boxes, fascias, lead flashing, gaps under felt, under tiles / slates/ shingle and in any existing bat boxes. Any gaps in brickwork or stonework are also identified and searched to check for potential access points to cavity or rubble filled walls behind.

A detailed internal survey was undertaken, this included searching the floors and flat surfaces for bat droppings, feeding remains, oiling, urine stains etc. as well as looking for any voids in the walls, roof materials etc. A search was made of the terrestrial habitats bordering the buildings and any trees, outbuildings or other features that may support roosting bats or nesting birds.

3.3. Tree Preliminary Bat Roost Assessment

There are a range of scattered trees close to the building including apple, field maple, elder and spruce. Due to their relatively young age and good condition they lacked any obvious PRF's. It is not anticipated that any notable trees will require removal or disturbance.

3.4. Bat Roost Category

Following completion of the external and internal surveys, each building / structure is classified in one of the following categories:

Confirmed bat roost: Presence determined from evidence of bats;

High potential: 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;

Moderate potential: A structure with one or more potential roost sites that could be used by bats due their size, shelter, protection, conditions and surrounding habitat but is unlikely to support a roost of high conservation status;

Low potential: A structure with one or more potential roost sites that could be used by individual bats opportunistically. These sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger number of bats (i.e. unlikely to be suitable for maternity or hibernation); or,

Negligible potential: No habitat features likely to be used by roosting bats.

3.5. Legislation

All species of bat are fully protected under The Conservation (Natural Habitats, &c.) Regulations 2017, through their inclusion on Schedule 2. Regulation 39 prohibits:

Deliberate killing, injuring or taking (capture) of Schedule 2 species (e.g. bats);

Deliberate disturbance of bat species as:

a) to impair their ability:

(i) to survive, breed, or reproduce, or to rear or nurture young;

(ii) to hibernate or migrate

b) to affect significantly the local distribution or abundance of the species;

Damage or destruction of a breeding site or resting place; and

Keeping, transporting, selling, exchanging or offering for sale whether live or dead or of any part thereof.

Bats are also currently protected under the Wildlife and Countryside Act 1981 (as amended) through their inclusion on Schedule 5. Under this Act, they are additionally protected from:

Intentional or reckless disturbance (at any level);

Intentional or reckless obstruction of access to any place of shelter or protection; and

Selling, offering or exposing for sale, possession or transporting for purpose of sale.

An EPS Licence issued by the relevant countryside agency (e.g. Natural England) will be required for works liable to affect a bat roost or for operations likely to result in a level of disturbance which might impair their ability to undertake those activities mentioned above (e.g. survive, breed, rear young and hibernate). The licence is to allow derogation from the relevant legislation but also to enable

appropriate mitigation measures to be put in place and their efficacy to be monitored. Though there is no case law to date, the legislation may also be interpreted such that, in certain circumstances, important foraging areas and/or commuting routes can be regarded as being afforded de facto protection, for example, where it can be proven that the continued usage of such areas is crucial to maintaining the integrity and long-term viability of a bat roost.

The species protection provision of the Habitats Directive, as implemented by the Conservation of Species and Habitats Regulations 2017 contain three “derogation tests” which must be applied by the Local Planning Authority when deciding whether to grant planning permission for a development that could harm a European Protected Species. The three tests are that:

The activity to be licensed must be for imperative reasons of overriding public interest or for public health and safety
There must be no satisfactory alternative; and
Favourable conservation status of the species must be maintained.

It is the responsibility of the applicant to submit sufficient information to address these tests when applying for planning permission. NB: For development activities, a Natural England Mitigation Licence application can only be obtained after planning permission has been granted. However, the granting of planning permission does not guarantee that a licence will be issued by Natural England.

Natural Environment and Rural Communities Act 2006 (NERC)

The NERC Act 2006 states that ‘every public authority must, in exercising its functions, have regard, so far as is consistent with the proper exercise of those functions, to the purpose of conserving biodiversity’, otherwise known as the Biodiversity Duty.

Wildlife and Countryside Act 1981, as amended

The WCA 1981 (as amended) is the principal mechanism for the legislative protection of wildlife in Great Britain. However, it does not extend to Northern Ireland, the Channel Islands or the Isle of Man. This legislation is the means by which the Convention on the Conservation of European Wildlife and Natural Habitats (the ‘Bern Convention’) and the European Union Directives on the Conservation of Wild Birds (79/409/EEC) and Natural Habitats and Wild Fauna and Flora (92/43/FFC) are implemented in Great Britain.

Countryside and Rights of Way Act (CRoW) 2000

The Countryside and Rights of Way (CRoW) Act 2000 extends the public’s ability to enjoy the countryside whilst also providing safeguards for landowners and occupiers. It gives a statutory right of access to open country and registered common land, modernises the rights of way system, gives greater protection to SSSIs, provides better management arrangements for Areas of Outstanding Natural Beauty (AONBs) and strengthens wildlife enforcement legislation.

The Environment Act 2021

First introduced to Parliament in 2019 finally received royal assent and became law on 9th November 2021. The Act principally creates a post Brexit framework to improve and protect the natural environment, which the newly created Office for Environmental Protection will oversee.

4. Survey Results

4.1. Desk Study

4.1.1. Designated sites

Statutory and Non-Statutory Sites of Nature Conservation Significance^{1 2}:

There are no statutory wildlife sites within 2km (Fig 13). This includes SSSIs (Sites of Special Scientific Interest), Ramsar sites, SPAs (Special Protection Areas), SACs (Special Areas of Conservation), AONB (Area of Natural Beauty) and NNRs (National Nature Reserves). (MAGIC Maps and data.gov.uk).

There are no County Wildlife Sites within 2km. Nearest being East Wood CWS approximately 2.6km west.

Impact Risk Zones

The proposed development falls outside any SSSI Impact Risk Zones (Fig 13).

Priority Habitat

Priority habitats within 2km include Wood Pasture and Parkland and Deciduous Woodland. To the south of the farm complex either side of the access track is an area of wood pasture and parkland which is a UK BAP Priority Habitat.

Pond and waterbodies:

The search for ponds within 250m was conducted using Ordnance Survey Data (OS Explorer Map OL40 Scale 1:25,000) and publicly available Environment Agency data. The off-site pond P1 90m to the south and the drain D1 70m south are the only water bodies within 250m of the buildings and proposed working areas (Figure 14).

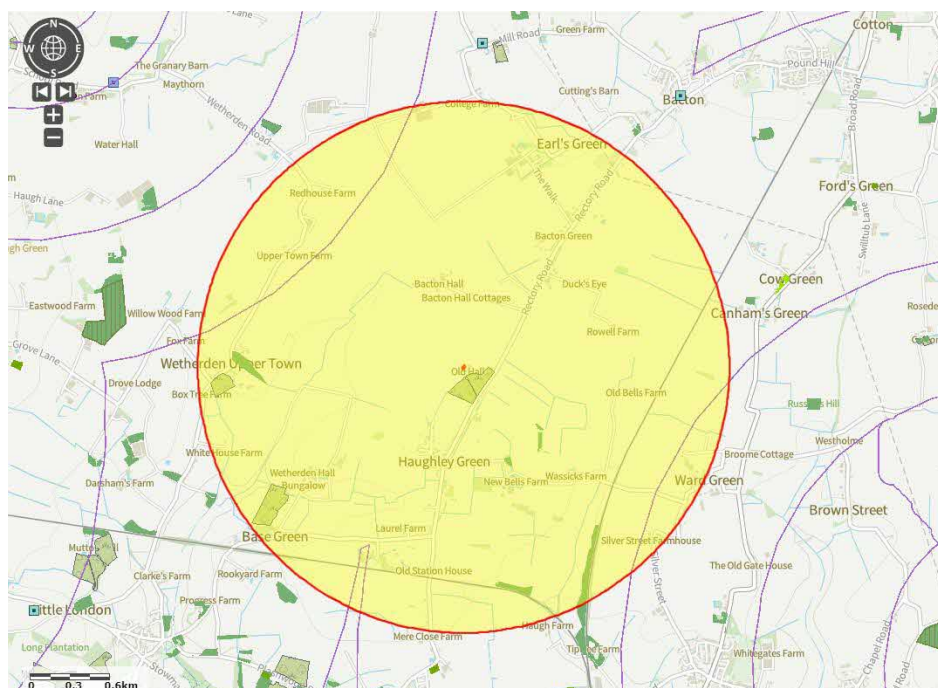


Figure 13 – MAGIC Site Check- Designated Sites within 2km

4.1.2. Protected and Priority Species Records ^{3 4}

The species recorded within 2km include 754 plant species, 254 insect species, 97 bird species, 5 amphibian species, 2 reptile species and 20 mammal species. Habitats within and adjacent to the site are considered unsuitable to support Otter *Lutra lutra*, Whiteclawed Crayfish *Austropotamobius pallipes*, Water Vole *Arvicola amphibius*, Hazel Dormouse *Muscardinus avellanarius*, Harvest Mouse *Micromys minutus*, and all species of reptiles. Therefore, these species require no further survey and are not considered any further in this report.

- Bats- There were a number of bat records provided within a 2km radius of the site with six species of bat recorded: common pipistrelle *Pipistrellus pipistrellus*; soprano pipistrelle *Pipistrellus pygmaeus*, brown long-eared *Plecotus auritus*; noctule *Nyctalus noctula*; Natterer's *Myotis nattereri* and serotine *Eptesicus serotinus*. A number of records related to roosts within St Mary's Church in Wetherden. Other bat records related to various roost sites in Haughley approximately 2.6km south. There were no bat records for the site or within Haughley Green. The site provides opportunities for foraging bats, with the boundary features likely utilised by bats. While the linear boundary features provide connectivity within the wider landscape, the site is relatively isolated by large arable fields, decreasing the likelihood of significant usage.
- Breeding Birds- A number of bird records were returned within the data search, including the red list species Skylark *Alauda arvensis*, Cuckoo *Cuculus canorus*, Yellowhammer *Emberiza citrinella*, Yellow Wagtail *Motacilla flava*, Grey Wagtail *Motacilla cinerea*, House Sparrow *Passer domesticus*, Tree Sparrow *Passer montanus*, Grey Partridge *Perdix perdix*, Turtle Dove *Streptopelia turtur*, Starling *Sturnus vulgaris*, Redwing *Turdus iliacus*, Fieldfare *Turdus pilaris*, Song Thrush *Turdus philomelos*, Mistle Thrush *Turdus viscivorus*, Corn Bunting *Emberiza calandra*, Lesser-spotted Woodpecker *Dendrocopos minor*, Spotted Flycatcher *Muscicapa striata*, Lapwing *Vanellus vanellus*, and Merlin *Falco columbarius*. Species observed within the site during the survey included Great Tit *Parus major*. The linear boundary features, hedges, trees and open buildings provide suitable habitat to support breeding and nesting birds.
- Great Crested Newts and Amphibians- 4 records of Great Crested Newt *Triturus cristatus*, 4 records of Smooth Newt *Lissotriton vulgaris*, 4 records of Common Toad *Bufo bufo*, and 6 records of Common Frog *Rana temporaria* were returned within the data search. However, closest records for Great Crested Newt were over 1km to the south-west. Habitat within and adjacent to the site is considered unsuitable to support amphibians during their aquatic life stages with 1 pond located within 250m of the proposed working areas. Terrestrial habitat is suboptimal due to current land use and its intensively managed nature. If a Great Crested Newt is found at any point, works should cease immediately, and the supervising ecologist or Natural England should be contacted for advice on how to proceed.
- Invertebrates- Species of butterfly returned within the data search include White-Letter Hairstreak *Satyrrium w-album*, White Admiral *Limenitis camilla*, and Small Heath *Coenonympha pamphilus*, which are all listed as Species of Principle Importance. No invertebrates were recorded, likely due to weather conditions at the time of survey. Habitat

within the site offers potential to support a limited range of the more common invertebrate species due to the intensively managed nature of the site. No further survey or mitigation is required.

- Reptiles- 1 record of grass snake *Natrix natrix* from Haughley Village 1.6km south in 2015. The site is considered unsuitable to support reptile species due to a lack of core habitat and the intensively managed arable fields. Therefore, no further surveys or mitigation measures are required.
- Barn Owl- 126 records of Barn Owl *Tyto alba* were returned within the data search, with the most recent dating from 2021 in the village of Haughley. Habitats within the site and open sided buildings offer potential to support nesting Barn Owl.
- Brown Hare- Although records of Brown Hare *Lepus lupus* were returned within the data search, the site as a whole is considered less likely to be used as a form than the bordering arable and pasture fields. No further survey or mitigation is required.
- European Hedgehog- 57 records of European Hedgehog *Erinaceus europaeus* were returned within the data search. Linear boundary features around the site offer some opportunities for foraging individuals.

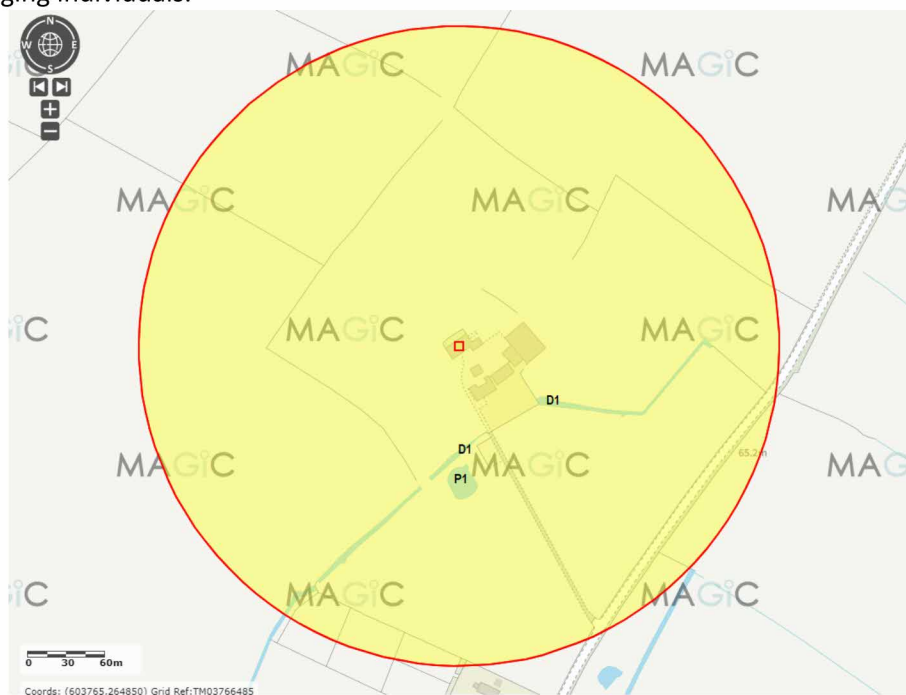


Figure 14. Pond search within 250m radius of site (MAGiC Maps)

1 Statutory designation include Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, National Nature Reserves (NNR), Sites of Special Scientific Interest (SSSI) and Local Nature Reserves (LNR).

2 Non-statutory sites are designated by local authorities and protected through the planning process (e.g. County Wildlife Sites, Sites of Importance for Nature Conservation or Local Wildlife Sites).

3 Notable species include Species of Principal Importance under the Natural Environment and Rural Communities Act 2006; Local Biodiversity Action Plan (LBAP) species; Birds of Conservation Concern (Eaton et al., 2009); and/or Red Data Book/nationally notable species (JNCC, undated).

4 Notable species include Species of Principal Importance under the Natural Environment and Rural Communities Act 2006; Local Biodiversity Action Plan (LBAP) species; Birds of Conservation Concern (Eaton et al., 2009); and/or Red Data Book/nationally notable species (JNCC, undated).

4.2 Habitats

The survey area comprises the agricultural buildings which are bordered to the east by hard standing and overgrown shrubs, trees and weeds along the margins of the arable field on the remaining boundaries. The wider landscape consists primarily of large arable fields, with a cluster of farm buildings, scattered trees and hedges. All habitats affected by the development are of limited value and easily replaceable.

4.3 Protected Species

4.3.1 Great Crested Newt- Some of the habitats present were theoretically suitable as terrestrial habitat for great crested newts and other amphibians. One pond P1 was identified within 250m of the site. The pond is located approximately 90m south of the buildings and on the distal side of the drain D1 (running water). The pond was assessed for suitability for great crested newts by undertaking a Habitat suitability Index assessment as developed by Oldham et al. 2000. The pond scored ‘average’ in suitability for great crested newts (see Table 1 below).

	SI ₁	SI ₂	SI ₃	SI ₄	SI ₅	SI ₆	SI ₇	SI ₈	SI ₉	SI ₁₀	SI ₁₁	SI ₁₂	Product	HSI	Suitability
P1	Location	Pond Area	Pond Drying	Water Quality	Shade	Fowl	Fish	Ponds	Terrestrial Habitat	Macrophytes					
→	Zone A	1 375m ²	0.75 Sometimes Dries	0.5 Moderate	0.67 81-85%	0.5 Minor	0.67 Absent	1 >12	1 Moderate	0.67 2-5%	0.35	0.01978	0.6754	Average	

Table 1- HSI assessment of pond P1

The pond had some waterfowl present but lacked fish. The pond dries on a seasonal basis and is choked with common reed as well as shaded by bordering trees. The pond has limited connectivity in the arable field corner and the running water in the drain to the north of it forms a potential barrier to dispersal. The site is considered to be of value at a **Site** scale only for great crested newt. The unmitigated impact is assessed as being **neutral** in the long-term with the reasonable avoidance measures as detailed in Section 5.

4.3.2 Reptiles- The site lacks core habitat for reptile species consisting of arable land, managed grassland, hard standing and trees and shrubs.

4.3.3 Breeding birds- Bird nests were evident in buildings B1 and B3 and included those of pigeon *Columba palumbus* and blackbird *Turdus merula*. Birds could use the isolated trees and shrubs as well as the buildings within the site for nesting and roosting.

4.3.4 Other protected and rare species (including Section 41 Species)-

Hedgehogs could potentially be found within the garden habitats.

4.4. Bat species- A detailed search of the exterior of the buildings and floor found no bat droppings or other evidence of bat activity. An internal inspection of the buildings, wall tops, floors and flat surfaces found no evidence of bat use. A search of the door and roof frames similarly did not find any urine stains, bat droppings or other evidence of bat roosts. The main barn (B1) contains no potential roosting features (PRFs) and is draughty and subject to wide temperature fluctuations. The concrete block extension (B2) is well pointed, and the timber frame and corrugated fiberboard roof has no PRFs. The wood store (B3) brick and block construction is well pointed and with evidence of repairs to the clay lump wall sections. The corrugated fiberboard roof and frame lacks any PRFs, although has a fairly dark and sheltered ridge board.

The buildings are all considered to lack sufficient access, protection and/or appropriate thermal conditions to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation). The buildings are therefore assessed as having **Negligible** probability of bat interest due to the lack of any evidence of bat roosts, general lack of potential roost features (PRFs)

and suboptimal roosting conditions. The site has connectivity to tree lines and hedgerows which are likely used by foraging and commuting bats.

No further roost characterization surveys are recommended due to the lower quality of the PRFs, the lack of bat evidence recorded, and the sub-optimal roosting conditions recorded. Any additional survey effort is considered disproportionate to the risk at hand. A single dusk/dawn survey provides little statistical confidence in roost presence for singleton non-breeding bats. Precautionary mitigation is therefore recommended to ensure the proposed conversion works complies with UK and European legislation and does not adversely impact the local bat population.

Due to the transient and highly mobile nature of bats, their presence within the buildings could not be excluded entirely and so reasonable avoidance mitigation and supervision of any demolition works will be undertaken under the supervision of an Ecological Clerk of Works ECoW. It is recommended for all contractors on-site to receive a toolbox talk prior to works commencing. In the unlikely event bats are found during the scheduled works, all works must stop immediately, and advice sought from a licensed ecologist. In such an instance, further survey work and a European Protected Species Licence (EPSL) may be required.

On the basis of the preliminary roost assessment there is no reasonable expectation that impacts to bats, such as would be considered an offence under Article 12 (1) of the Habitats Directive of The Conservation of Habitats and Species (Amendment EU Exit) Regulations 2017 will occur as a result of the proposal. The potential for roosting bats however can rarely be excluded entirely due to the highly mobile nature of bats and seasonal use of roosts. Due to the small possibility of solitary non-breeding bats being present, a precautionary approach should be adopted with regards to conversion works. It is recommended that a further inspection of the building is undertaken by a licensed bat ecologist prior to works commencing and a soft roof-strip is conducted under the supervision of an Ecological Clerk of Works (ECoW).

Foraging and commuting bats

Due to the habitats present within the site and the local landscape it is considered likely that foraging or commuting bats use the wider area. A sensitive lighting strategy must be implemented to ensure that any foraging resources are not illuminated.

5. Constraints

5.1. Desk Study

These results can only give an indication of species presence in this location. The absence of recent records for certain species in an area may be due to the lack of survey effort or the non-submission of records, rather than the absence of those species. Many species records are also at low resolution and do not indicate their exact location.

5.2. Building Survey

It is expected that evidence of bats (particularly in exposed areas or on external faces of the buildings) which may be present at other times of the year may not have been visible during the survey. In view of the above constraints this assessment cannot be considered to provide a comprehensive survey of the ecological interest of the site. It does, however, provide a “snapshot” of the ecological interest present on the day of the visit and highlights areas where further survey work may be required.

A difficulty in inspecting buildings for bats is that the presence of smaller roosts is generally harder to detect than more significant colonies, particularly those of crevice dwelling bats such as pipistrelle. In addition, bats are very transient in nature with complex roosting behaviour and often move between several different roosting sites during the year. Therefore, the presence of transient singleton roosts (e.g. single male roost) can be present at any time of year. The potential for roosting bats however can rarely be excluded entirely due to the highly mobile nature of bats and seasonal use of roosts. Due to the small possibility of solitary non-breeding bats, a precautionary approach should be adopted with regards to conversion works.

6. Evaluation and Impact Assessment

Please note that all evaluation and recommendations are based upon the findings of this preliminary bat roost assessment and on the proposal outlined in 2.4 above. If the site changes, then the potential for protected species to use the site may change accordingly. If the proposals alter from those at present, then it is possible that the likely impacts will also change.

6.1. Bat Species

6.1.1. Overview of legislation relating to bat species

British bat species are protected under the Wildlife and Countryside Act (1981) and Conservation of Habitats and Species Regulations (2017). This makes it an offence to kill or injure bats or damage or destroy a place of shelter or protection, amongst other actions (see Appendix 1 for more details). Any activity that would result in a contravention of the above legislation would likely require a European Protected Species Licence (EPSL) from the relevant statutory body (Natural England). Works or mitigation activities involving interference with bats or bat shelters must be carried out by a licensed bat worker.

6.1.2. Summary of findings and likely impacts in absence of mitigation.

The value of the site to bats is assessed as Low at the Parish/ Neighborhood scale due to the probability of minor bat use. The impact of the development upon bats is considered to be Neutral subject to the reasonable avoidance and mitigation measures being implemented.

With respect to the impact on bats, an offence under Article 12 of the European Directive and Regulation 41 of Conservation of Species and Habitats (Amendment EU Exit) Regulations 2019 is unlikely to occur when undertaking the proposed conversion works. The development is not considered to have a significant impact upon commuting or foraging bats and there will be no severing of connectivity.

No further roost characterization surveys are recommended due to the lower quality of the PRFs, the lack of bat evidence recorded, and the sub-optimal roosting conditions recorded. Any additional survey effort is considered disproportionate to the risk at hand. A single dusk/dawn survey provides little statistical confidence in roost presence for singleton non-breeding bats, especially pipistrelle bats which switch roosts very frequently. Precautionary mitigation is, therefore, recommended to ensure the proposed demolition works complies with UK and European legislation and does not adversely impact the local bat population.

It is recommended for all contractors on-site to receive a toolbox talk prior to works commencing, and also for any PRFs (i.e. lead flashing, soffits/ fascia's etc.) to be inspected by the licensed bat ecologist prior to a soft-strip. In the unlikely event bats are found during the scheduled works, all works must stop immediately, and advice sought from a licensed ecologist. In such an instance, further survey work and a European Protected Species Licence (EPSL) may be required.

6.2. Bird Species

6.2.1. Overview of legislation relating to bird species

Under the Wildlife and Countryside Act 1981 it is illegal to take, damage or destroy the nests of wild birds whilst being built or in use. It is not an offence to carry out work in areas that they use, outside of the nesting period (see Appendix 1 for more details).

6.2.2. Summary of findings and likely impacts in absence of mitigation

Evidence of nesting birds was recorded inside the buildings B1 and B3 and the buildings are bordered by trees, shrubs and scrubby areas. In the absence of mitigation, conversion of the buildings and vegetation clearance could result in the loss of potential bird nesting habitat, although other buildings and structures (notably farm buildings) are present within the wider local environment.

6.2.3. Recommendations

If works which are likely to damage bird nests (e.g., demolition works, re-roofing) need to be carried out during the nesting period (1st March to 31st August) a check should be made for nesting birds, the day before works are due to commence. Any birds nesting should be left to complete their breeding (i.e. until the young have fully fledged) before carrying out works on areas of the building where birds are nesting. An ecologist can help with this if necessary.

6.3 Amphibians and Reptiles

The site is considered to be of value at a Site only scale only for great crested newt. The unmitigated impact is assessed as being neutral. The terrestrial habitats bordering the building were assessed as having low suitability for amphibians and reptiles. The site is also fairly isolated bordered by large arable field.

6.4 Hedgehogs, small mammals and terrestrial vertebrates.

Hedgehogs, small mammals and terrestrial vertebrates are potentially present on the site and consequently consideration should be given to their migration within and through the site during the construction works and to their free movement through gaps in fences and hedgerows post development.

6.5 Designated Sites and Habitats

The site was a significant distance from statutorily designated nature conservation sites (LNR, SSSI, RAMSAR). The proposed development is small scale. The risk of direct or indirect impact to such sites was considered very low. Further surveys or mitigation for the protection of such habitats were considered unnecessary. No impacts on Designated Sites are envisaged given the scale of the development and distance to Designated Sites. The proposed development will see the loss of some self-set trees, scrub and common weed species of low ecological value. No other habitats of ecological significance will be impacted by the proposed works.

7. Mitigation and Biodiversity Enhancement

Nesting birds: Nesting birds should not be disturbed during the nesting season typically 1st March to 31st August (species dependant). It is recommended that the site should be cleared outside of the nesting bird season. To increase nesting opportunities generally and to compensate for the loss of nesting areas, at least 3 nest boxes will be installed. Installation of the nest boxes will be supervised by 'Eco-Check Ltd' or an experienced ecologist to ensure the correct positioning for the species. The types of nest boxes will include:

- 1 x EcoRoost / Schwegler 28/32mm hole box <https://www.eco-roost.co.uk/>
 - 1 x Eco-Roost triple bank house sparrow box
 - 1 x Eco-Roost open fronted box for blackbird/robin
- Small mammals including hedgehogs: any debris and materials arising from the proposed development should be stored in skips and/or on pallets to prevent creating refuge sites for small mammals. Clearance of any debris or waste should be done sensitively with consideration to disturbance of hedgehogs.
 - Bats: As part of general biodiversity enhancement for the site, it is recommended that new bat roosting resources are introduced to include:
 - 1 x EcoRoost / Schwegler double-chamber bat box
 - 1 x EcoRoost / Ibstock Bat Brick

All staff working on site should receive a toolbox talk (TBT) prior to the commencement of works. The TBT will focus on PRFs, protective legislation, and the risk of bat presence on-site.

Any new external lights will be set on a motion detector and positioned in such a way that they do not shine beyond the immediate curtilage of the building. Low intensity lighting should be used where possible, in place of high intensity discharge or sodium lamps, as this will minimize disturbance to foraging and commuting bats, in accordance with the Bat Conservation Trust's publication *Bats and Artificial Lighting in the UK* (Guidance Note 08/2018). Light pollution by artificial lighting will be kept to a minimum and light spillage avoided. The following specific mitigation will be put in place to minimize disturbance to bats caused by the lighting of the site. The following mitigation strategies have been taken from Bat Conservation Trust *Landscape and Urban Design for Bats and Biodiversity* (Gunnell et al., 2012) and other referenced sources:

Minimise light spill by eliminating any bare bulbs and upward pointing light fixtures. The spread of light should be kept near to or below the horizontal plane, by using as steep a downward angle as possible and/or shield hood. Flat, cut-off lanterns are best;
Use light sources that emit minimal ultra-violet light (van Langevelde and Feta, 2001) and avoid the white and blue wavelengths of the light spectrum, so as to avoid attracting insects and thus potentially reducing numbers in adjacent areas;
Limiting the height of lighting columns to eight metres and increase the spacing of lighting columns (Fure, 2006) can reduce the spill of light into unwanted areas;
Avoid using reflective surfaces under lights or light reflecting off windows (e.g. on to trees);
Only the minimum amount of light needed for safety and access should be used and or turned off when the site is not in use;
Artificial lighting proposals should not directly illuminate boundary habitats, which may be of value to foraging or commuting bats and birds (e.g. green corridors).

8. Recommendations for Further Surveys

If development has not commenced within 18 months of October 2023, it is recommended that an updated survey is undertaken, as the suitability of the site for protected species may have changed.

We recommend that the following condition from BS42020:2013 is attached to any planning consent:

“Occasionally European protected species, such as bats, can be found during the course of development even when the site appears unlikely to support them or after an ecological survey has found no previous evidence of them. In the event that this occurs, the developer must stop work immediately and seek the advice of a suitability qualified ecological consultant and/or the relevant statutory nature conservation organisation.”

Reason: In accordance with the requirements of the adopted Joint Core Strategy and paragraph 118 of the National Planning Policy Framework, and for the undertaking of the council’s statutory function under the Natural Environment and Rural Communities Act (2006).

9. References

Bat Surveys-Good Practice Guidelines, J. Collins, 2016.

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

Mitchell-Jones, & McLeish, A.P. Ed.(2004),3rd Edition Bat Workers’ Manual

Mitchell-Jones. English Nature (2004). Bat Mitigation Guidelines. EN

Regini, K, 2000, Guidelines for ecological evaluation and impact assessment, In Practice: Bulletin of the Institute of Ecology and Environmental Management, 29, 1-7.

Natural England, MAGIC MAP Search, September 2023 www.magic.gov.uk

The National Biodiversity Network Website (www.nbn.org.uk)

Eco-Roost Bird and Bat Boxes- <https://www.eco-roost.co.uk/>

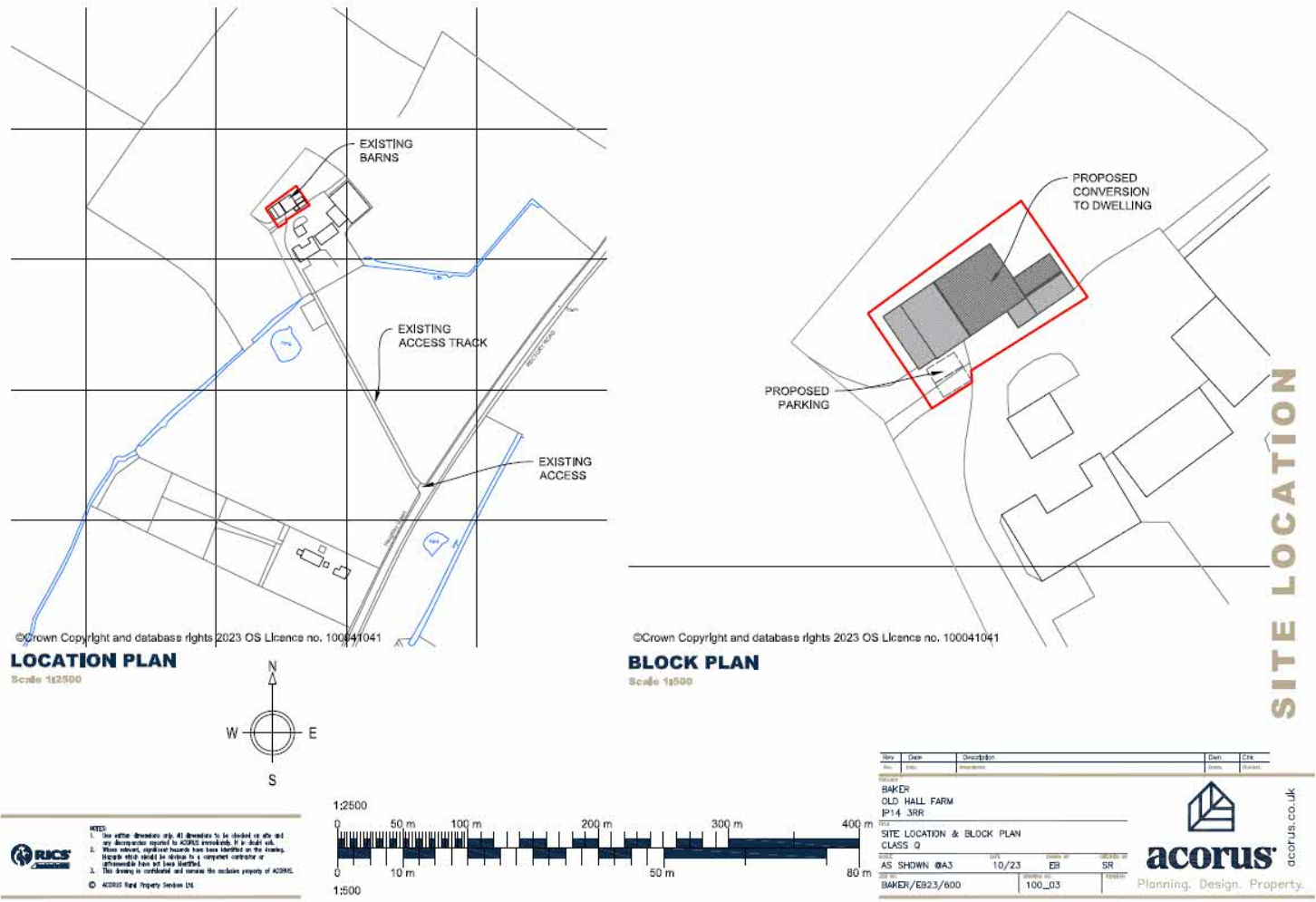
COPYRIGHT

The copyright of this document remains with Eco-Check Ltd. The contents of this document therefore must not be disseminated, copied or reproduced in whole or in part for any purpose without the written consent of Eco-Check Ltd.

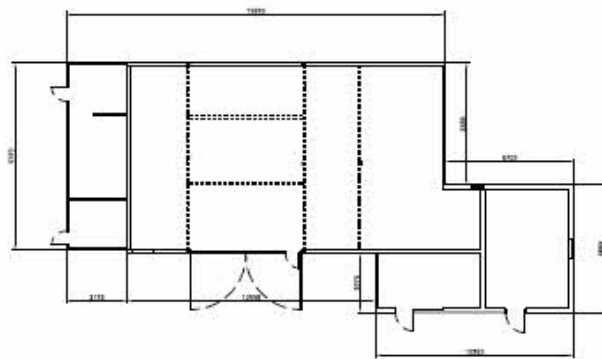
PROTECTED SPECIES

This report contains sensitive information relating to protected species. The information contained herein must not be disseminated without the prior written consent of Eco-Check Ltd.

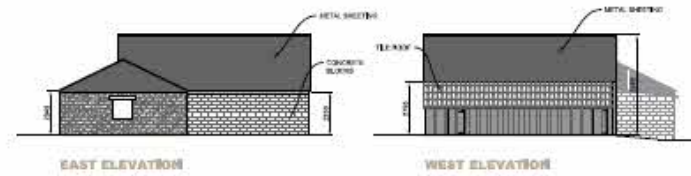
APPENDIX 1



Existing Site Plan

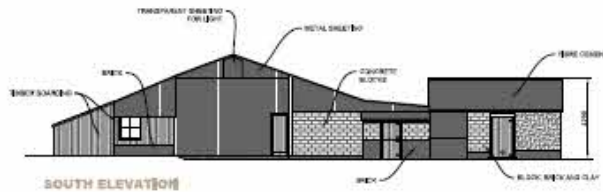


FLOOR PLAN

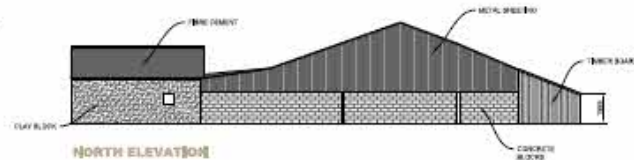


EAST ELEVATION

WEST ELEVATION



SOUTH ELEVATION



NORTH ELEVATION

FLOOR PLAN & ELEVATIONS

Scale: 1/1100



- NOTES:**
1. The client is responsible for all drawings to be checked on site and any discrepancies reported to ACORUS immediately. It is their job.
 2. Where relevant, structural drawings have been identified on the drawings. Records which should be drawn to a complete standard or otherwise have not been identified.
 3. The drawing is uncontracted and remains the exclusive property of ACORUS.
 4. Ordnance Survey Paper Map Copying Licence Number: 10004945.
 5. ACORUS Asset Property Reference D1.

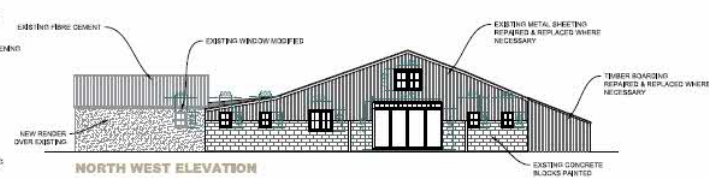
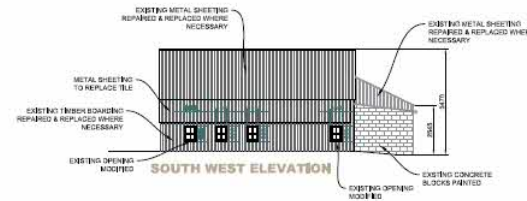
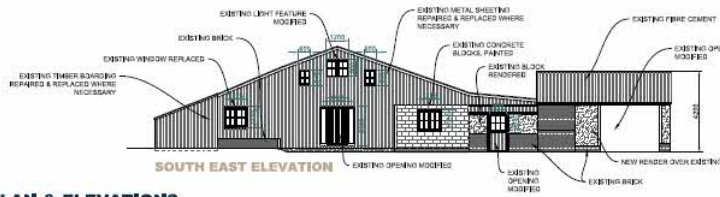
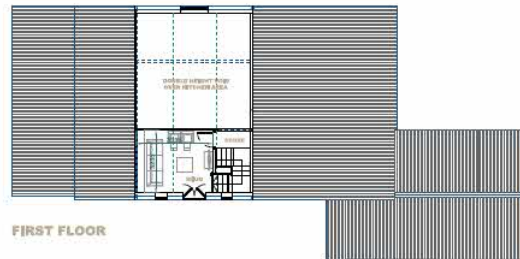


Client	ACORUS	Project	EXISTING AGRICULTURAL BUILDING SURVEY
Date	10/23	Sheet	100L_01
Scale	1/1100	Author	DJ
Drawn	DJ	Checked	DJ
As Shown	10/23	By	DJ
Revised	10/23/100	Scale	100L_01



EXISTING

Existing Elevations



FLOOR PLAN & ELEVATIONS

Scale: 1:100

- NOTES:**
1. Use written dimensions only. All dimensions to be checked on site and any discrepancies reported to ACORUS immediately. If in doubt ask.
 2. Where relevant, significant hazards have been identified on the drawing. Hazards which should be obvious to a competent contractor or professional have not been identified.
 3. This drawing is confidential and remains the exclusive property of ACORUS.
 4. Ordnance Survey Paper Map Copyright Licence Number: 100029436.
 5. ACORUS Rural Property Services Ltd.



FLOOR AREA INTERNAL 212 M²



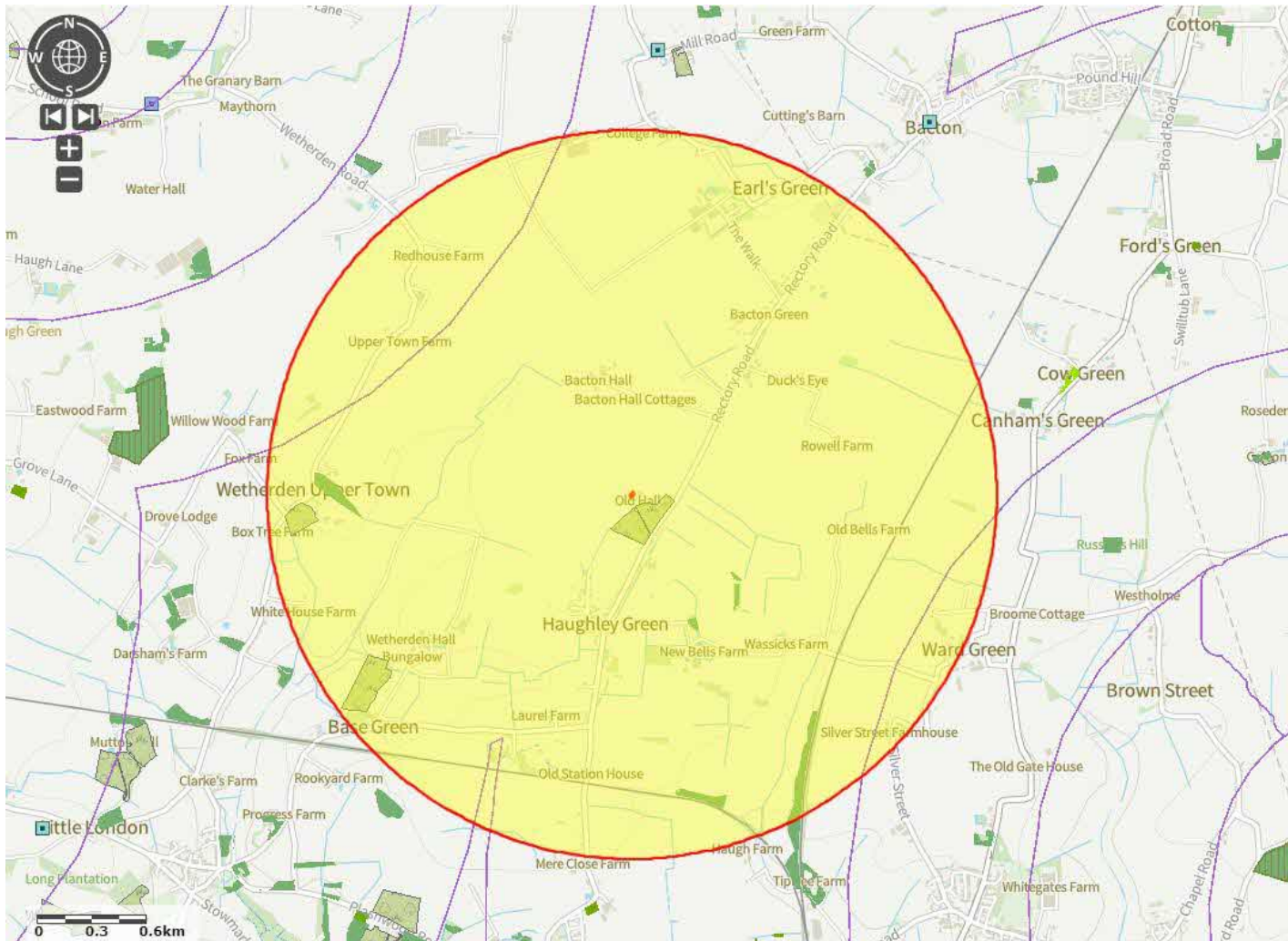
Client	SAHES	Project	GLD HALL FARM
Address	IP14 3RR	Drawn by	AS
Drawn by	AS	Checked by	EB
Date	11/23	Scale	SR
Project Ref	BAKER/EB23/600	Version	100_02



PROPOSED

Proposed Floor Plan and Elevations

APPENDIX 2



Map – Map of Statutory Wildlife Sites and Priority Habitats within 2km

Wildlife site legislation

A variety of sites are designated in the UK, under various Conventions, Directives and Regulations, for their nature conservation importance and interest. The general aim of these designations is to conserve and protect ecological resources in addition to raising awareness and understanding. Other non-statutory sites are afforded some protection through local plans.

RAMSAR Sites

Wetlands of international importance. Ramsar Sites are effectively protected, through the planning system, under the Wildlife and Countryside Act 1981, as amended, and the Countryside and Rights of Way Act 2000 through their notification as SSSIs and through other regulatory systems addressing water, soil and air quality.

Special Protection Areas (SPAs)

SPAs are the most important habitats for rare and migratory birds within the European Union. The Birds Directive, adopted by the UK in 1979, provides for the protection, management and control of all species of naturally occurring wild birds in the European territory of Member States, including the UK. The provisions of the Birds Directive are transposed into English law by the Conservation of Natural Habitats and Species Regulations 2010.

Special Areas of Conservation (SACs)

SACs are sites that are chosen to conserve the natural habitat types and species of wild flora and fauna listed in Annex I and II of the Habitats Directive. They are the best areas to represent the range and variety of habitats and species within the European Union. The provisions of the Habitats Directive were transposed into English law by the Conservation of Natural Habitats and Species Regulations 2010.

Sites of Special Scientific Interest (SSSIs)

SSSIs are nationally important sites for wildlife, geological and geomorphological features in England. They are designated and protected under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981, as amended. They receive additional protection under the Countryside and Rights of Way Act 2000.

National Nature Reserves (NNRs)

NNRs are nationally important areas of wildlife habitat and geological formations in Britain. NNRs are designated and protected under the National Parks and Access to the Countryside Act 1949 and the Wildlife and Countryside Act 1981, as amended. They receive additional protection under the Countryside and Rights of Way Act 2000. They are managed for the benefit of nature conservation.

Local Nature Reserves (LNRs)

LNRs are similar to NNRs but they apply to the local context. They are sites of value to nature conservation and are designated under the National Parks and Access to the Countryside Act 1949. They are managed for the benefit of nature conservation.

Hedgerows

Hedgerows are a very significant wildlife habitat over large parts of Britain. They provide essential refuge for a great many woodland and farmland plants and animals. Hedgerows are given protection under The Hedgerows Regulations 1997. As a result, since 1 June 1997, it has been against the law to remove most countryside hedgerows (or parts of them) without first notifying the local planning authority.

Ancient Woodland

Ancient woodlands are woodlands that have been established since or before 1600AD. They are non-statutory sites and are not legally protected but they may be afforded some protection in, for example, structure and local plans.

County Wildlife Sites

These non-statutory sites are sites designated by a local authority as being of County nature conservation value but may not be notified as SSSIs. These selected sites are known as wildlife sites (WS), sometimes called SINCs or SNCIs.

Local Sites

These non-statutory sites may be designated by a local authority as being of local nature conservation value but are not notified as SSSIs. They have a variety of titles dependent upon the designating authority.

Regionally Important Geological / Geomorphological Sites (RIGS)

Regionally Important Geological and Geomorphological Sites (RIGS) are designated by locally developed criteria and are currently the most important places for geology and geomorphology outside statutorily protected land such as Sites of Special Scientific Interest (SSSI). The designation of RIGS is one way of recognising and protecting important earth science and landscape features.

Species Legislation and Protection

The legislation which protects various species within the British fauna or flora is outlined below:

Birds

The Birds Directive (1979)

The European Community Council Directive on the Conservation of Wild Birds (79/409/EEC) sets out general rules for the conservation of all naturally occurring wild birds, their nests, eggs and habitats.

Wildlife and Countryside Act 1981

Sections 1 to 8 of the Wildlife and Countryside Act relate to the protection of birds. All birds, their nests and eggs are protected by law and it is thus an offence, with certain exceptions to:

- intentionally kill, injure or take any wild bird
- intentionally take, damage or destroy the nest of any wild bird whilst it is in use or being built
- intentionally take or destroy the egg of any wild bird
- have in one's possession or control any wild bird, dead or alive, or any part of a wild bird, which has been taken in contravention of the Act or the Protection of Birds Act 1954
- have in one's possession or control any egg or part of an egg which has been taken in contravention of the Act or the Protection of Birds Act 1954
- use traps or similar items to kill, injure or take wild birds
- have in one's possession or control any bird of a species occurring on Schedule 4 of the Act unless registered, and in most cases ringed, in accordance with the Secretary of State's regulations (see Schedules)

Countryside and Rights of Way Act 2000

This act strengthens the existing provisions of the Wildlife and Countryside Act 1981 for the enforcement of wildlife legislation, including a new offence of "recklessly" disturbing any wild bird listed on Schedule 1 while it is nest building, or at a nest containing eggs or young, or recklessly disturbing the dependent young of such a bird.

UK Biodiversity Action Plan Priority Species

A number of British Birds are UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Bats

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention)

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention or CMS) was adopted in Bonn, Germany in 1979 and came into force in 1985. Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix 1 of the Convention), concluding multilateral Agreements for the conservation and management of migratory species which require or would benefit from international cooperation (listed in Appendix 2), and by undertaking co-operative research activities.

The European Community is a party to CMS. In general it undertakes activities under the Convention involving issues where the Community has 'competence' (the authority to act as a Community rather than as the member states individually or collectively as the Union). Thus the Community is a Party to the Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS) as this agreement has significant relevance to fishing activities, over which the Community has authority within the Union.

The UK ratified the Convention in 1985. The legal requirement for the strict protection of Appendix I species is provided by the Wildlife & Countryside Act (1981 and as amended). The UK has currently ratified three legally binding Agreements under the Convention: the Agreement on the Conservation of Populations of European Bats (EUROBATS); the African-Eurasian Migratory Waterbird Agreement (AEWA); and ASCOBANS. An Agreement on the Conservation of Albatrosses and Petrels is currently in the process of being ratified; as of May 2002, eight countries including the UK had so far signed, and the Agreement will enter into force after five countries have ratified. The UK has also ratified the Memorandum of Understanding (MoU) on the Conservation and Management of Marine Turtles and their Habitats of the Indian Ocean and South-East Asia, in respect of the British Indian Ocean Territory.

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) 1979

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of all wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to afford special protection to the most vulnerable or threatened species (including migratory species) (listed in Appendix 3). To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

To implement the Bern Convention in Europe, the European Community adopted Council Directive 79/409/EEC on the Conservation of Wild Birds (the EC Birds Directive) in 1979, and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive) in 1992. Among other things the Directives provide for the establishment of a European network of protected areas (Natura 2000), to tackle the continuing losses of European biodiversity on land, at the coast and in the sea to human activities.

The Habitats Directive (1992)

The European Community Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) aims to protect the European Union's biodiversity. It requires member states to provide strict protection for specified flora and fauna (i.e. European Protected Species) outside of designated sites.

The Conservation of Habitats and Species Regulations 2010

The Conservation of Habitats and Species Regulations 2010 formally transpose the requirements of the Habitats Directive into national law (replacing the Conservation (Natural Habitats &c) Regulations 1994). They build on existing nature conservation legislation for the protection of habitats and species by introducing requirements for assessing plans and projects affecting European designations and licensing certain activities affecting European Protected Species. All bats are listed as 'European protected species of animals'.

Licences are required for checking known roosts or for carrying out work that may disturb bats, such as the management or disturbance of features that are known to be used as roosting sites.

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. All UK native species of Bat are listed in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended). The legislation protects bats and their roosts under Section 9 of the Act, such that it is an offence to:

- Intentionally kill, injure or take a bat
- Possess, control or sell any live or dead specimen or anything derived from a bat
- Intentionally damage, destroy or obstruct access to any structure or place used for shelter or protection (i.e. a roost) by a bat
- Deliberately, or intentionally disturb a bat while it is occupying a roost

Countryside and Rights of Way Act 2000

This act strengthens the existing provisions of the Wildlife and Countryside Act 1981 for the enforcement of wildlife legislation, including a new offence of "recklessly" disturbing bats or recklessly damaging, obstructing or destroying their roosts.

UK Biodiversity Action Plan Priority Species

Several species of bat are UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for these species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Otter

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) 1979

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of all wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to afford special protection to the most vulnerable or threatened species (including migratory species as listed in Appendix III of the Convention). To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

To implement the Bern Convention in Europe, the European Community adopted Council Directive 79/409/EEC on the Conservation of Wild Birds (the EC Birds Directive) in 1979, and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive) in 1992. Among other things the Directives provide for the establishment of a European network of protected areas (Natura 2000), to tackle the continuing losses of European biodiversity on land, at the coast and in the sea to human activities.

The Habitats Directive (1992)

The European Community Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) aims to protect the European Union's biodiversity. It requires member states to provide strict protection for specified flora and fauna (i.e. European Protected Species) outside of designated sites.

The Conservation of Habitats and Species Regulations 2010

The Conservation of Habitats and Species Regulations 2010 formally transpose the requirements of the Habitats Directive into national law (replacing the Conservation (Natural Habitats &c) Regulations 1994). They build on existing nature conservation legislation for the protection of habitats and species by introducing requirements for assessing plans and projects affecting European designations and licensing certain activities affecting European Protected Species.

Licences are required for carrying out work that may disturb or injure Otter or destroy breeding sites.

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. Otter is a Schedule 5 species and is fully protected under Section 9 of the Wildlife and Countryside Act (as amended) under which it is an offence to:

- intentionally kill, injure or take an Otter
- deliberately capture or kill an Otter
- possess or control any live or dead specimen or anything derived from an Otter
- intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by an Otter
- deliberately, intentionally or recklessly disturb an Otter while it is occupying a structure or place which it uses for that purpose

UK Biodiversity Action Plan Priority Species

Otter is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced. The protection of UK BAP Priority Species such as Otter is implemented through Local Planning Policy.

Water Vole

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. Since April 2008 the water vole has received full legal protection through its inclusion on Schedule 5 of the Wildlife and Countryside Act 1981 in respect of Section 9. Full legal protection under the Act makes it an offence to:

- Intentionally kill, injure or take water voles.
- Possess or control live or dead water voles or derivatives
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection
- Intentionally or recklessly disturb water voles whilst occupying a structure or place used for that purpose.
- Sell water voles or offer or expose for sale or transport for sale.
- Publish or cause to be published any advertisement which conveys the buying or selling of water voles.

Countryside and Rights of Way Act 2000

This act strengthens the existing provisions of the Wildlife and Countryside Act 1981 for the enforcement of wildlife legislation, including a new offence of "recklessly" destroying or damaging the habitats of certain protected species, including water vole, or recklessly disturbing water vole.

UK Biodiversity Action Plan Priority Species

Water vole is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced. The protection of UKBAP Priority Species such as water vole is implemented through Local Planning Policy.

Brown hare

UK Biodiversity Action Plan Priority Species

Brown hare is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for this species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Hedgehog

UK Biodiversity Action Plan Priority Species

Hedgehog is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for this species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Great Crested Newt

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) 1979

The Convention on the Conservation of European Wildlife and Natural Habitats (the Bern Convention) was adopted in Bern, Switzerland in 1979, and came into force in 1982. The principal aims of the Convention are to ensure conservation and protection of all wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to afford special protection to the most vulnerable or threatened species (including migratory species) (listed in Appendix 3). To this end the Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1000 wild animal species.

To implement the Bern Convention in Europe, the European Community adopted Council Directive 79/409/EEC on the Conservation of Wild Birds (the EC Birds Directive) in 1979, and Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the EC Habitats Directive) in 1992. Among other things the Directives provide for the establishment of a European network of protected areas (Natura 2000), to tackle the continuing losses of European biodiversity on land, at the coast and in the sea to human activities.

The Habitats Directive (1992)

The European Community Council Directive on the Conservation of Natural Habitats of Wild Fauna and Flora (92/43/EEC) aims to protect the European Union's biodiversity. It requires member states to provide strict protection for specified flora and fauna (ie European Protected Species) outside of designated sites.

The Conservation of Habitats and Species Regulations 2010

The Conservation of Habitats and Species Regulations 2010 formally transpose the requirements of the Habitats Directive into national law (replacing the Conservation (Natural Habitats &c) Regulations 1994). They build on existing nature conservation legislation for the protection of habitats and species by introducing requirements for assessing plans and projects affecting European designations and licensing certain activities affecting European Protected Species.

Licences are required for carrying out work that may disturb or injure Great Crested Newts or destroy breeding sites.

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. Great Crested Newt is a Schedule 5 species and is fully protected under Section 9 of the Wildlife and Countryside Act (as amended) under which it is an offence to:

- Intentionally kill, injure or take a Great Crested Newt
- Deliberately capture or kill a Great Crested Newt
- Possess or control any live or dead specimen or anything derived from a Great Crested Newt
- Intentionally or recklessly damage, destroy or obstruct access to any structure or place used for shelter or protection by a Great Crested Newt
- Deliberately, intentionally or recklessly disturb a Great Crested Newt while it is occupying a structure or place which it uses for that purpose
- Deliberately take or destroy the eggs of a Great Crested Newt

UK Biodiversity Action Plan Priority Species

Great Crested Newt is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced. The protection of UKBAP Priority Species such as Great Crested Newt is implemented through Local Planning Policy.

Reptiles (Adder, Grass Snake, Slow worm, Common Lizard)

Wildlife and Countryside Act 1981

This act provides varying degrees of protection for the listed species of flora and fauna. All UK native reptiles are protected under Schedule 5 (Section 9) of the Wildlife and Countryside Act 1981 (as amended). Common lizard, Slow Worm, Grass snake and Adder receive partial protection under the Act. Only part of sub-section 9(1) and all of sub-section 9(5) apply; these prohibit the intentional killing and injuring and trade (i.e. sale, barter, exchange, transporting for sale and advertising to sell or to buy).

Countryside and Rights of Way Act 2000

This act strengthens the existing provisions of the Wildlife and Countryside Act 1981 for the enforcement of wildlife legislation, including a new offence of "recklessly" killing or injuring the above-listed species.

Biodiversity Action Plan Priority Species

Common Lizard, Grass Snake, Adder and Slow Worm are listed on the UK Biodiversity Action Plan as they are priority species for conservation. The protection of UKBAP Priority Species is implemented through Local Planning Policy.

Common Toad

UK Biodiversity Action Plan Priority Species

Common Toad is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for this species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Stag Beetle

UK Biodiversity Action Plan Priority Species

Stag Beetle is a UK Priority Species for Conservation under the UK Biodiversity Action Plan and a National Species Action Plan has been produced for this species. The protection of UK BAP Priority Species is implemented through Local Planning Policy.

Plants

Wildlife and Countryside Act 1981

The Wildlife and Countryside Act (as amended) provides protection to a number of species of plant as listed in Schedule 8. Section 13 identifies measures for the protection of wild plants. It prohibits the unauthorised intentional uprooting of any wild plant species and forbids any picking, uprooting or destruction of plants listed on Schedule 8. It also prohibits the sale, etc, or possession for the purpose of sale of any plants on Schedule 8 or parts or derivatives of Schedule 8 plants. It provides certain defences, e.g. provision to cover incidental actions that are an unavoidable result of an otherwise lawful activity.

UK Biodiversity Action Plan Priority Species

Several species of plant found in the area are UK Priority Species for Conservation under the UK Biodiversity Action Plan, for which National Species Action Plans have been produced.

Table 6.1 Guidance on the optimal timing for carrying out specialist ecological surveys and mitigation

This is not definitive and is intended to provide an indication only. The timing of surveys and animal activity will be dependent on factors such as weather conditions. Please consult the *species briefing sheets* for more detailed information, including species distribution.

KEY	
	Recommended survey time
	No surveys
	Mitigation conducted at these times
	Mitigation works restricted

- * Where survey techniques involve the capture, handling or disturbance of *protected species* then only licensed persons can undertake surveys; personal *survey and monitoring* licences are obtained from English Nature, Countryside Council for Wales, Environment and Heritage Service (NI) or Scottish Natural Heritage
- ** Where mitigation involves the killing, capture, injury and/or disturbance of *protected species* and/or the damage, destruction or obstruction of their *habitats*, a *development licence* must be obtained from the Department for Food and Rural Affairs (England), Scottish Executive's Environment and Rural Affairs Department, Welsh Assembly (Countryside Division) or the Environment and Heritage Service Northern Ireland. Licences will be granted only to persons who have proven competence in dealing with the species concerned. Development licence applications take approximately 30 days to be processed by government departments. Where mitigation works need to be conducted under licence *before* works begin, licence applications will need to be submitted considerably earlier.

take approximately 30 days to be processed by government departments. Where mitigation works need to be conducted under licence *before* works begin, licence applications will need to be submitted considerably earlier.

		Licence required?	J	F	M	A	M	J	J	A	S	O	N	D	
Habitats / vegetation	Surveys	N	Mosses and lichens. No other detailed plant surveys – Phase 1 surveys only (least suitable time)			Detailed habitat assessment surveys Surveys for higher plants and ferns Mosses and lichens in April, May and September only					Mosses and lichens. No other detailed plant surveys – Phase 1 surveys only (least suitable time)				
	Mitigation	N	Planting and translocation		No mitigation for majority of species						Planting and translocation				
Birds	Surveys	N	Winter birds		Breeding birds / migrant species			Breeding birds		Breeding birds / migrant species			Winter birds		
	Mitigation	N	Clearance works may be conducted at this time, but must stop immediately if any nesting birds are found		No clearance or construction works Bird nesting season					Clearance works may be conducted at this time, but must stop immediately if any nesting birds are found					
Bats	Surveys	*	Inspection of hibernation, tree and building roosts			No surveys		Activity surveys and inspection of building roosts. Emergence counts.				No surveys		Inspection of hibernation, tree and building roosts	
	Mitigation	**	Works on maternity roosts		Works on maternity roosts until mid-May. Works on hibernation roosts from mid-March			Works on hibernation roosts only			Hibernation roosts until November. Maternity roosts from mid-September		Works on maternity roosts only		

Table 6.1 Guidance on the optimal timing for carrying out specialist ecological surveys and mitigation (continued)

		Licence required?	J	F	M	A	M	J	J	A	S	O	N	D
Other reptiles	Surveys	N	No surveys – reptiles in hibernation		Activity surveys from March to June and in September / October. Surveys are limited by high temperatures during July and August. Peak survey months are April, May and September.								No surveys – reptiles in hibernation	
	Mitigation	N	Scrub clearance		Capture and translocation programmes can only be conducted whilst reptiles are active (March to June and September / October). Trapping is limited by high temperatures during July / August. Scrub clearance								Scrub clearance	
Great crested newts (n/a in NI)	Surveys	*	No surveys – newts in hibernation		Pond surveys for adults: mid-March to mid-June. Surveys must include visits undertaken between mid-April and mid-May. Egg surveys April to mid-June. Larvae surveys from mid-May. Terrestrial habitat surveys			Larvae surveys to mid-August. Terrestrial habitat surveys		Terrestrial habitat surveys		No surveys – newts in hibernation		
	Mitigation	**	No trapping of newts. Pond management only		Newt trapping programmes in ponds and on land			Newt trapping on land only				No trapping of newts. Pond management only		
Natterjack toads	Surveys	*	No surveys - toads in hibernation			Surveys of breeding ponds for adults. Surveys for tadpoles from May onwards. Surveys for adults on land			Surveys for adults on land.		No surveys – toads in hibernation			
	Mitigation	**	Pond management works			Trapping of adults in ponds from April to July. Trapping of adults on land. Trapping of tadpoles from May to early September				Pond management works				
White-clawed crayfish	Surveys	*	Reduced activity			Surveys can be undertaken	Avoid surveys (females are releasing young)		Optimum time for surveys			Reduced activity		
	Mitigation	***	Avoid capture programmes (low activity levels may lead to animals being easily missed)			Exclusion of crayfish from construction areas.	Avoid capture programmes		Exclusion of crayfish from construction areas			Avoid capture programmes (low activity levels may lead to animals being easily missed)		
Fish	Surveys	*	For coastal, river and stream-dwelling species, the timing of surveys will depend on the migration pattern of the species concerned. Where surveys require information on breeding, the timing of surveys will need to coincide with the breeding period, which may be summer or winter months, depending on the species.											
	Mitigation	**	Mitigation for the protection of watercourses is required at all times of year. Mitigation for particular fish species will need to be timed so as to avoid the breeding season. This varies from species to species.											

*** Where mitigation involves the capture of white-clawed crayfish, a mitigation licence must be obtained from English Nature, Countryside Council for Wales, Environment and Heritage Service (NI) or Scottish Natural Heritage. Licences will be granted only to persons who have proven competence in dealing with the species concerned.



Artificial lighting and wildlife

Interim Guidance: Recommendations to help minimise the impact artificial lighting

Wherever human habitation spreads, so does artificial lighting. This increase in lighting has been shown to have an adverse effect on our native wildlife, particularly on those species that have evolved to be active during the hours of darkness. Consequently, development needs to carefully consider what lighting is necessary and reduce any unnecessary lighting, both temporally and spatially. When the impacts on different species groups are reviewed, the solutions proposed have commonalities that form the basis of good practice. These are outlined in the following document.

Overview of impacts

Invertebrates

Artificial light significantly disrupts natural patterns of light and dark, disturbing invertebrate feeding, breeding and movement, which may reduce and fragment populations. Some invertebrates, such as moths, are attracted to artificial lights at night. It is estimated that as many as a third of flying insects that are attracted to external lights will die as a result of their encounter.¹ Insects can become disoriented and exhausted making them more susceptible to predation. In addition, the polarisation of light by shiny surfaces attracts insects, particularly egg laying females away from water. Reflected light has the potential to attract pollinators and impact on their populations, predators and pollination rates. Many invertebrates natural rhythms depend upon day-night and seasonal and lunar changes which can be adversely affected by artificial lighting levels.

It is not always easy to disentangle the effects of lighting on moths from other impacts of urbanisation. However, it is known that UV and green and blue light, which have short wavelengths and high frequencies, are seen by most insects and are highly attractive to them. Where a light source has a UV component, male moths in particular will be drawn to it. Most light-induced changes in physiology and behaviour are likely to be detrimental. They discern it to be 'light', so they do not fly to feed or mate.²

Birds

There are several aspects of changes to bird behaviour to take into account. The phenomenon of robins and other birds singing by the light of a street light or other external lighting installations is well known, and research has shown that singing did not have a significant effect on the bird's body mass regulation. However, it was felt that the continual lack of sleep was likely to be detrimental to the birds' survival and could disrupt the long-term circadian rhythm that dictates the onset of the breeding season³. Many species of bird migrate at night and there are well-documented cases of the mass mortality of nocturnal migrating birds as they strike tall lit buildings. Other UK bird species that are particularly sensitive to artificial lighting are long-eared owls, black-tailed godwit and stone curlew.⁴

¹ Bruce-White C and Shardlow M (2011) A Review of the Impact of Artificial Light on Invertebrates - See more at: <http://www.buglife.org.uk/advice-and-publications/publications/campaigns-and-reports/review-impact-artificial-light#sthash:s7GPA1vL.dpuf>

² As above

³ Pollard A. (2009) Visual constraints on bird behaviour. University of Cardiff

⁴ Rodriguez A., Garcia A.M., Cervera F. and Palacios V. (2006) Landscape and anti-predation determinants of nest site selection, nest distribution and productivity in Mediterranean population of Long-eared Owls, *Asio otus*. *Ibis*, 148(1), pp. 133-145

Mammals

A number of our British mammals are nocturnal and have adapted their lifestyle so that they are active in the dark in order to avoid predators. Artificial illumination of the areas in which these mammals are active and foraging is likely to be disturbing to their normal activities and their foraging areas could be lost in this way. It is thought that the most pronounced effect is likely to be on small mammals due to their need to avoid predators. However, this in itself has a knock-on effect on those predators.

The detrimental effect of artificial lighting is most clearly seen in bats. Our resident bat species have all suffered dramatic reductions in their numbers in the past century. Light falling on a bat roost exit point, regardless of species, will at least delay bats from emerging, which shortens the amount of time available to them for foraging. As the main peak of nocturnal insect abundance occurs at and soon after dusk, a delay in emergence means this vital time for feeding is missed. At worst, the bats may feel compelled to abandon the roost. Bats are faithful to their roosts over many years and disturbance of this sort can have a significant effect on the future of the colony. It is likely to be deemed a breach of the national and European legislation that protects British bats and their roosts.

In addition to causing disturbance to bats at the roost, artificial lighting can also affect the feeding behaviour of bats and their use of commuting routes. There are two aspects to this: one is the attraction that short wave length light (UV and blue light) has to a range of insects; the other is the presence of lit conditions.

As mentioned, many night-flying species of insect are attracted to lamps that emit short wavelength component. Studies have shown that, although noctules, serotines, pipistrelle and Leisler's bats, take advantage of the concentration of insects around white street lights as a source of prey, this behaviour is not true for all bat species. The slower flying, broad-winged species, such as long-eared bats, barbastelle, greater and lesser horseshoe bats and the *Myotis* species (which include Brandt's, whiskered, Daubenton's, Natterer's and Bechstein's bats) generally avoid external lights.

Lighting can be particularly harmful if it illuminates important foraging habitats such as river corridors, woodland edges and hedgerows used by bats. Studies have shown that continuous lighting along roads creates barriers which some bat species cannot cross⁵. It is also known that insects are attracted to lit areas from further afield. This could result in adjacent habitats supporting reduced numbers of insects, causing a further impact on the ability of light-avoiding bats to feed.

These are just a few examples of the effects of artificial lighting on British wildlife, with migratory fish, amphibians, some flowering plants, a number of bird species, glow worms and a range of other invertebrates all exhibiting changes in their behaviour as a result of this unnatural lighting.

Recommendations

Survey and Planning

The potential impacts of obtrusive light on wildlife should be a routine consideration in the Environmental Impact Assessment (EIA) process⁶. Risks should be eliminated or minimised wherever possible. Some locations are particularly sensitive to obtrusive light and lighting schemes in these areas should be carefully planned.

In August 2013, Planning Minister Nick Boles launched the new National Online Planning Guidance Resource aimed at providing clearer protection for our natural and historic environment. The guidance looks at when lighting pollution concerns should be considered and is covered within one of the on line planning practice

⁵ Stone E. L., Jones G and Harriss (2009) Street lighting disturbs commuting bats. *Current Biology*, 19, pp 1-5

⁶ See also: Institution of Lighting Professionals - Professional Lighting Guide (PLG 04) Guidance on undertaking lighting environmental impact assessments)

guides⁷. The guide provides an overview for planners with links to documents that aim to give planners an overview of the subject through the following discussion points:

1. When is obtrusive light / light pollution relevant to planning?
2. What factors should be considered when assessing whether a development proposal might have implications for obtrusive lighting / light pollution?
3. What factors are relevant when considering where light shines?
4. What factors are relevant when considering how much the light shines?
5. What factors are relevant when considering possible ecological impact?

This can help planners reach the right design through the setting of appropriate conditions relating to performance and mitigation measures at the planning stage.

The Institution of Lighting Professionals (ILP) recommends that Local Planning Authorities specify internationally recognised environmental zones for exterior lighting control within their Development Plans⁸. In instances lacking classification, it may be necessary to request a Baseline Lighting Assessment/Survey conducted by a Lighting Professional in order to inform the classification of areas, particularly for large-scale schemes and major infrastructure projects.

When assessing or commissioning projects that include the installation of lighting schemes, particularly those subject to the EIA process, the following should be considered and relayed to applicants:

- *Ecological consultants should confirm the presence of any sensitive fauna and flora*, advising the lighting designers of bat routes and roosts and other areas of importance in order to ensure that reports correspond with each other.
- *Ecological consultants should consider the need for quantitative lighting measurements*. In some instances it may be necessary for further lighting measurements to be taken. For example, outside an important bat roost. These should follow best practice guidance from the ILP and would ideally be conducted by a Lighting Professional.
- *Where appropriate, professional lighting designers should be consulted* to design and model appropriate installations that achieve the task but mitigate the impacts. This should be done at the earliest opportunity. Early decisions can play a key role in mitigating the impact from lighting.
- *Reports submitted should outline the impacts of lighting in relation to ecology*, making clear reference to the ecological findings, highlighting any sensitive areas and detail proposed mitigation. Consideration should also be given to internal lighting where appropriate.
- *Post -installation checks and sign off upon commissioning should be carried out by the lighting designer* to ensure that the lighting installation has been installed in accordance with the design, that predictions were accurate and mitigation methods have been successful.

Principles and design considerations

Do not

- *provide excessive lighting*. Use only the minimum amount of light needed for the task.
- *directly illuminate bat roosts* or important areas for nesting birds

Avoid

- *installing lighting in ecologically sensitive areas* such as: near ponds, lakes, rivers, areas of high conservation value; sites supporting particularly light-sensitive species of conservation significance (e.g. glow worms, rare moths, slow-flying bats) and habitat used by protected species.
- *using reflective surfaces under lights*.

⁷<http://planningguidance.planningportal.gov.uk/blog/guidance/light-pollution/when-is-light-pollution-relevant-to-planning/>

⁸Institution of Lighting Professionals (2011) Guidance Notes for the Reduction of Obtrusive Light GN01:2011.

Do

- *consider employing a competent lighting designer* who will apply the principals of providing the right light, in the right place, at the right time and controlled by the right system.
- *minimise the spread of light* to at, or near horizontal and ensure that only the task area is lit. Flat cut-off lanterns or accessories should be used to shield or direct light to where it is required.
- *consider the height of lighting columns*. It should be noted that a lower mounting height is not always better. A lower mounting height can create more light spill or require more columns. Column height should be carefully considered to balance task and mitigation measures.
- *consider no lighting solutions where possible* such as white lining, good signage and LED cats eyes. These options can also be effective. For example, light only high-risk stretches of roads, such as crossings and junctions, allowing headlights to provide any necessary illumination at other times.
- *use temporary close-boarded fencing until vegetation matures*, to shield sensitive areas from lighting.
- *limit the times that lights are on to provide some dark periods*. The task being lit often varies, for example roads are less used after 23.00hrs and car parks are empty. A lighting designer can vary the lighting levels as the use of the area changes reducing lighting levels or perhaps even switching installations off after certain times. This use of adaptive lighting can tailor the installation to suit human health and safety as well as wildlife needs.

Technological specifications

Research from the Netherlands has shown that spectral composition does impact biodiversity.

- *Use narrow spectrum light sources* to lower the range of species affected by lighting.
- *Use light sources that emit minimal ultra-violet light*
- *Lights should peak higher than 550 nm*
- *Avoid white and blue wavelengths of the light spectrum* to reduce insect attraction and where white light sources are required in order to manage the blue short wave length content they should be of a warm / neutral colour temperature <4,200 kelvin.

Further guidance on the spectral composition of artificial lighting will be made available following the publication of research from the Netherlands.

Further reading:

- A review of the impact of artificial light on invertebrates. Buglife. 2011
- Royal Commission on Environmental Pollution. 2009. Artificial light in the environment. London, HMSO
- "The Ecological Consequences of Artificial Night Lighting" edited by Longcore and Rich
- Shedding Light: A survey of local authority approaches to lighting in England. CPRE 2014

For more information on lighting and wildlife see:

- Bat Conservation Trust (BCT) — www.bats.org.uk
- Campaign for Dark Skies (CfDS) — www.britastro.org/dark-skies
- Bats and Lighting Research project — www.batsandlighting.co.uk/index.html.
- Institution of Lighting Professionals (ILP) — www.theilp.org.uk
- Lichtopnatuur - Impact of artificial light on flora and fauna in The Netherlands - <http://www.lichtopnatuur.org/>

<p>Eco-Roost Bat Brick</p> <p>https://www.eco-roost.co.uk/shop?Collection=Bat+Bricks</p>	
<p>Eco-Roost Double Chamber Bat Box</p> <p>https://www.eco-roost.co.uk/product-page/kent-hibernation-rect</p>	
<p>Eco-Roost Double Kent Box</p> <p>https://www.eco-roost.co.uk/product-page/kent-style-rect-large</p>	
<p>Eco-Roost 28mm, 32mm and Open fronted bird boxes</p> <p>https://www.eco-roost.co.uk/product-page/tit-sparrow-front-fall</p>	

Examples of Bat Boxes

It is important that the bat boxes are positioned sufficiently high above the ground to dissuade ground predators, a minimum of 4m up; and at a distance from sources of artificial lighting. The boxes should be located on the west, south and east facing sides of the trees / buildings giving bats a range of microclimates through the year and direct access to foraging and commuting habitat along site boundaries.

Schwegler 1FF Bat Box		The 1FF bat box can be sited in trees or on buildings. Size: 43cm high x 27cm wide x 14cm deep.
Schwegler 2F Bat Box		The 2F bat box can be sited in trees or on buildings. Size: 33cm high x 16cm diameter.
1FQ Schwegler Bat Roost (For External Walls)		Suitable for a variety of crevice-dwelling bats, for larger roosts or maternity groups. Internal layout provides 3 different areas where bats can roost, offering different levels of light and temperature. Gaps ranging from 1.5cm to 3.5cm wide offering various places for bats to roost. Suitable to erect on most types of external brick, timber or concrete structures. Size: 60cm high x 35cm wide x 9cm deep.
Improved Roost-Maternity Bat Box		A large 3 crevice bat box. 3 separate crevices each with different temperature characteristics. Suitable for larger roosts or maternity groups of small crevice-dwelling species such as pipistrelle bats. Suitable to erect on buildings or trees. Size: 49cm high x 26cm wide x 13cm deep.
Timber Double Chamber Bat Box		This bat box is suitable for siting on trees in gardens or woodland and requires no annual maintenance. Should not be painted or treated with any type of preservative, as these can harm the bats. Size: 31.3cm high x 16cm wide x 16cm deep.
The Kent Bat Box		Made from untreated rough-sawn timbers ca. 20mm thick. Crevices can be between 15mm and 25mm wide. Suitable to fit to walls, other flat surfaces or trees. Approximate dimensions (boxes vary in size): 24cm wide x 47.5cm high x 17cm deep.

Bird Nesting Habitat

CedarPlus Nest Box

Available with 2 entrance hole sizes:

32mm hole – suitable for great, marsh and coal tits, redstart, nuthatch, pied flycatcher, house sparrow and tree sparrows.

26mm hole – to allow access only to blue, marsh and coal tits (and possibly wrens).

Height: 370mm; Width: 156mm; Depth: 175mm



Schwegler 1B Bird Box

The 1B nest box will attract a wide range of species and is available with different entrance hole sizes to prevent birds from competing with each other for the boxes.

It is available in 4 colours: brown, green, white and red. The nest box can be attached to the tree or wall using an aluminium nail or by hanging over a branch and is made from Woodcrete to ensure that it is long-lasting.

Entrance hole sizes:

32mm hole – will attract great, blue, marsh, coal and crested tit, redstart, nuthatch, collared and pied flycatcher, wryneck, tree and house sparrow.

26mm hole – suits blue, marsh, coal and crested tit and possibly wren. All other species are prevented from using the nest box due to the smaller entrance hole.

Oval hole (29x55mm) – suits redstarts because more light enters the brood chamber. It is also suitable for all other species which nest in the 32mm boxes.

Height: 23cm; Diameter: 16cm



No. 10 Schwegler Swallow Nest

The Swallow Nest No. 10 consists of a woodcrete nesting bowl which is attached to a wooden panel of formaldehyde-free chipboard. The nest should be placed inside outbuildings such as sheds, barns or stables leaving a distance of at least 35mm between the top of the nest and wall top. Ensure there is always access for the birds through an open window or skylight, or other high level access (minimum of 50mm (H) x 70mm (W) gap). Multiple nests should not be placed at less than 1m intervals.

To avoid problems with droppings accumulating, a droppings board could be placed beneath each nest box to collect the droppings.



PAGE LEFT BLANK INTENTIONALLY