

PRELIMINARY BAT ROOST ASSESSMENT

ALLEN'S FARM, SCHOOL ROAD, NEATISHEAD, NR12 8BU



Prepared by James Hodson BSc, MSc
(Bat Survey License 2017-30927-CLS-CLS, Great Crested Newt Licence 2018-36283-CLS-CLS)
Trading as 'Eco-Check Ltd'
White House Cottage
Knapton Green
Norfolk
NR28 0RU
Tel: 07914 130493
Email: ecocheckconsultancy@gmail.com

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.

CONTENTS

1. Executive Summary	3
2. Introduction	4
2.1. Purpose of Survey.....	4
2.2. Scope of Report.....	4
2.3. Aim of survey.....	4
2.4. Site Location.....	5
2.5. Proposed Works.....	5
3. Methodology	6
3.1. Desk Study	6
3.2. Preliminary Bat Roost Assessment (PRA).....	6
3.3. Tree Roost Assessment	7
3.4. Bat Roost Assessment.....	8
3.5. Legislation.....	8
3.6. Constraints.....	9
4. Survey Results	11
4.1. Desk Study	11
4.2. Building Survey	13
4.3 Preliminary Bat Roost Assessment.....	13
4.4 Dusk Emergence Survey.....	14
4.5 Conclusions.....	12
5. Constraints	13
5.1. Desk Study	13
5.2. Building Survey	16
6. Evaluation and Recommendations	17
6.1. Bat Species	17
6.1.1. Overview of legislation relating to bat species	17
6.1.2. Summary of findings	17
6.1.3. Recommendations for further survey	17
6.1.4. Assessment of impact and licensing	18
6.1.5. Reasonable avoidance mitigation	19
6.2. Bird Species	19
6.2.1. Overview of legislation relating to bird species	19
6.2.2. Summary of findings and likely impacts in absence of mitigation	19
6.2.3. Recommendations.....	19
7. Habitats Regulations and Derogation	20
8. Recommendations for Further Surveys	20
9. References	21
Appendix 1 - Site Photos	22
Appendix 2- Desk Study Data	23

1.0 Executive Summary

Introduction: Eco-Check was commissioned to undertake a Preliminary Bat Roost Assessment of a single storey barn at Allens Farm, Neatishead, Norfolk, NR12 8BU, to support a planning application for a single storey conversion of the existing structure. This report has been prepared in accordance with the recommended format in 'Bat Surveys-Good Practice Guidelines, J. Collins, 2016' 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.

Desk Study: A desk study was undertaken to obtain and review records of bat activity and roosts within 2 km of the site. The respective search radius was considered suitable for obtaining background information on bat species diversity and the occurrence of [recorded] roosts within the wider environs of the site, although the zone of influence is considered much smaller in context of the proposed demolition works.

Preliminary Roost Assessment (PRA): A bat survey was undertaken by accredited agent Joseph Hassall, working under the license of James Hodson BSc, MSc (Natural England, Level 2 Bat Survey License 2017-30927-CLS-CLS), of Eco-Check Ltd on 6th April 2022 of a detached one storey building of brick construction, brick walls and pan-tiles over bitumen sarking. The building is glazed along the east elevation with tiled and bitumen lined roof and wooden windows and doors.

Desk Study: NBIS released details of 338 records within the search radius 5km; 215 of these records have been identified down to species level (nine species were recorded in total) and 123 down to genus (i.e. unidentified *Pipistrelle* and *Myotis* spp.). Previous bat surveys of adjacent barns in 2017 by Eco-Check recorded common pipistrelle, soprano pipistrelle and brown long-eared bats roosting.

PRA: A detailed search of the exterior of the building surfaces, ledges, floor etc. found no bat droppings, no feeding remains and no evidence of bat activity. Some potential bat access points were found within the roof structure. The internal inspection found some scattered droppings of a size and texture consistent with pipistrelle bats. The building was assessed as having **Low** bat roosting potential. In accordance with Bat Surveys-Good Practice Guidelines, J. Collins, 2016 and 'Bat Workers Manual, 3rd Edition, Mitchell and Jones, 2004 buildings with **Low** roost potential require a single survey to determine presence.

Dusk Survey: Due to the **Low** bat roosting potential a single dusk survey was undertaken on the 17th May 2022. No bats emerged from the property and low bat activity was noted, mainly focused on commuting and foraging passes.

2. Introduction

2.1. Purpose of Survey

Eco-Check was commissioned to undertake a Preliminary Bat Roost Assessment of a semi-detached brick outbuilding at Allen's Farm, School Road, Neatishead, NR12 8BU to support a planning application to North Norfolk District Council for conversion of the building for ancillary accommodation. cottage and which will require modifications to the existing thatch roof.

This report has been prepared in accordance with the recommended format in 'Bat Surveys-Good Practice Guidelines, J. Collins, 2016' 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 works does not adversely impact the local bat population. 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 building on-site supporting a potential roost (based on the respective architecture and structural condition); and;
- 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 Scope of the Report

This report details the methodology, results and conclusions of a daytime survey undertaken on the 6th May 2021. The purpose of the survey was to confirm the presence or likely absence of bat roosts, within the building, the value of the building for roosting bats and the presence of any nesting birds.

The survey data collected was used primarily to evaluate the likely impact of the proposed conversion works on roosting bats and also lighting and design layout proposals on roosting, foraging and commuting bats. A general assessment of the wider site was also undertaken to assess if any other protected or priority species, including great crested newt, are likely to be present or impacted by the proposed demolition and construction works.

2.3 Aim of Survey

To examine the building to determine the presence or likely absence of nesting barn owls and/or roosting bats, species protected under the Wildlife and Countryside Act 1981 with respect to the proposed development works. If found to be present, the survey aims to determine the use of the building by protected species so that the impacts of the development proposal can be assessed and appropriate advice given to address these impacts. In the light of the survey this report provides initial

recommendations for potential mitigation measures if protected species are likely to be affected by the proposed works.

It may be necessary to obtain a European Protected Species (EPS) license in accordance with the above legislation. This report has been prepared in accordance with the recommended format in 'Bat Surveys-Good Practice Guidelines, J. Collins, 2016' 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 and trees for bats and bat roosts.

2.4 Site Location and Description

The buildings surveyed are situated at Allen's Farm between Butcher's Common and Workhouse Common to the south of School Lane, Neatishead, Norfolk, NR12 8BU, grid reference TG343199. The site is situated on the southern edge of the small village and civil parish of Neatishead in the North Norfolk District. The village is located approximately 900m to the north and approximately 12km north-east of Norwich City (See Fig 1).

The habitats immediately bordering the site includes bare ground, gardens, buildings, improved grassland, scattered scrub, scattered trees, tall ruderal vegetation and ornamental plants and shrubs. Beyond the immediate site the habitats comprise arable fields and grassland bordered by mature scattered trees, hedgerows, residential buildings and mature gardens and amenity grassland. The site has connectivity to a block of woodland 100m to the north.

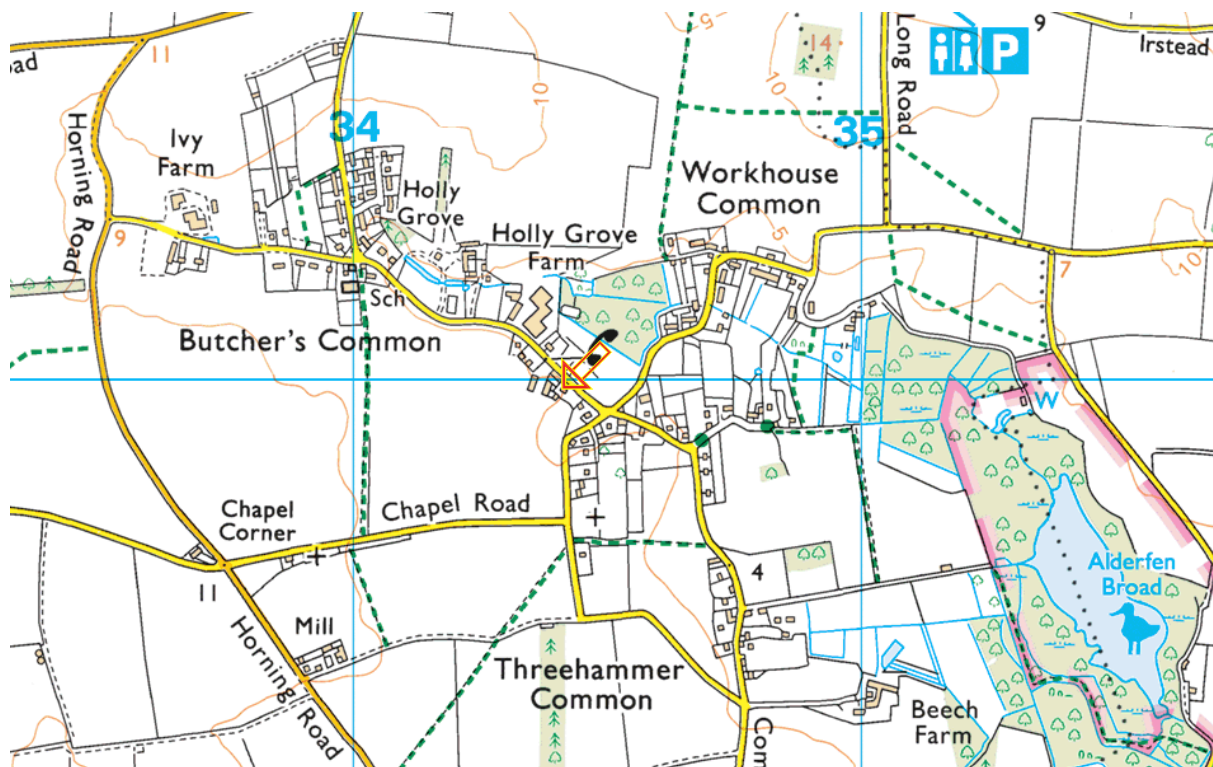


Figure 1. Site Location Map – Street Map 2022



Figure 2. Aerial Site View and Buildings – Google Earth-January 2021

2.5 Proposed Works

The proposed works are for the conversion of the barn for ancillary accommodation. The building will presumably have roof alterations, insulation and window and door openings. Some minor brickwork repairs and repointing are also required.

3.0 Methodology

3.1 Desk Study

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 1km of the site was undertaken for non-statutory wildlife sites.

A desk study for records of relevant bat records within 5km of the site was obtained from Norfolk Biodiversity Information Service (NBIS) as well as previous survey data and local knowledge in the immediate vicinity.

3.2 Preliminary Roost Assessment

A licensed bat ecologist undertook a PRA on 6th April 2022 in accordance with best practice guidance (Collins, 2016). The objectives of 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 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, window panes, 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 of the roof space where it was evident the roof space was well sealed. A search was made of the terrestrial habitats bordering the building and any trees, outbuildings or other features that may support roosting bats or nesting birds.

3.3 Tree Preliminary Roost Assessment

No trees were present close to the dwelling with potential roosting features such as rot holes, splits, frost fissures, flaking bark etc.

3.4 Bat Roost Category

Following completion of the external and internal surveys, each building / structure are 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 of Habitats and Species (Amendment EU Exit) Regulations 2019, 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 Habitats and Species (Amendment EU Exit) Regulations 2019 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 EPS 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)

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. Under Section 41 of the Act, the Secretary of State must publish a list of the living organisms and types of habitats which in the Secretary of State’s opinion are of principal importance for the purpose of conserving biodiversity.

This list is based on those species listed in the UK Biodiversity Framework as priority species (see Section 2.3) in addition to Annex II species listed under The Conservation (Natural Habitats, &c.) Regulations 2017. The S41 list replaces the list published under Section 74 of the Countryside and Rights of Way (CRoW) Act 2000.

3.6 Limitations

The extensiveness of the ecological assessment was limited by the season in which the site visit was made. To confirm the presence or absence of all protected species usually requires multiple visits at suitable times of the year. Summer surveys between May and September are considered optimal. The site visit focussed on assessing the potential of the site to support species given protection under British or European law.

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.

It is expected that evidence of bats (particularly in exposed areas or on external faces of the building) which may be present at other times of the year may not have been visible during the survey. 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.

4.0 Survey Results

4.1 Desk Study

Statutory designated sites¹ –

There are four designated sites within 2km

- Alderfen Broad – SSSI - 0.7km east
- Ants Broad and Marshes – SSSI -1.6km north-east
- Broadlands – RAMSAR – 1.6km east
- How Hill – NNR – 1.5km south-east

Locally designated sites² –

There are two County Wildlife Sites or Roadside Nature Reserves within 2km:

- Larch & Fleece plantations – CWS 1204 - 1.8km south-west
- Square Covert – CWS 1203 - 1.6km south-west

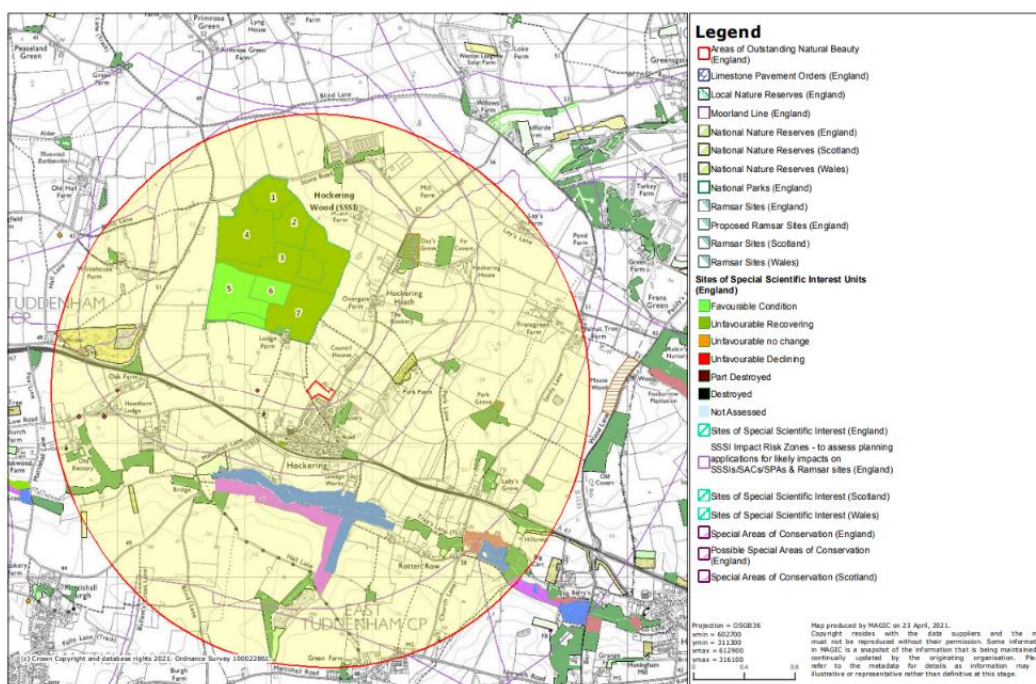


Figure 2. 2km designated site search – Magic.defra.gov.uk

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 Legally protected species include those listed in Schedules 1, 5 or 8 of the Wildlife and Countryside Act 1981; Schedule 2 of the Conservation of Habitats and Species Regulations 2017 (as amended); or in the Protection of Badgers Act 1992 (as amended).

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).



Figure 3. CWS Sites within 2km of Allen's Farm – Google earth – May 2022

Bat Records ^{3 4}

NBIS released details of 338 records within the search radius 5km; 215 of these records have been identified down to species level (nine species were recorded in total) and 123 down to genus (i.e. unidentified *Pipistrelle* and *Myotis* spp.). Two roosts were highlighted within the search area. Details of the most recent records are detailed below;

- *Myotis* Bat (*Myotis* sp.) – 2015
- Common Pipistrelle (*Pipistrellus pipistrellus*) -2016
- Soprano Pipistrelle (*Pipistrellus pygmaeus*) – 2016
- Brown Long-eared Bat (*Plecotus auritus*) – 2016

We have records for bats from just north of Neatishead (common pipistrelle *Pipistrellus pipistrellus*, soprano pipistrelle *Pipistrellus pygmaeus* and noctule *Nyctalus noctula*), Irstead (common and/or soprano pipistrelles and Daubenton's bat *Myotis daubentonii*) and Horning (common pipistrelles, soprano pipistrelles and Daubenton's bat). Prior survey work by in the vicinity at Coltishall, Scottow, Hickling Broad and Horsey Broad, has recorded a range of bat species including common pipistrelle, soprano pipistrelle, brown long-eared bat *Plecotus auritus*, noctule, serotine *Eptesicus serotinus*, *Myotis* species, Nathusius' pipistrelle *Pipistrellus nathusii* and barbastelle *Barbastella barbastellus*.

4.2 Building Survey

The building is a single storey structure with red brick masonry walls and a pan tile roof set off timber purlins and intermediate timber truss, set on a concrete base. It has a bitumen lining on the interior of the roof. The windows and doors are made of wood. The building is accessed from the courtyard via a large set of a double doors. The gable ends of the building are sealed and in good condition, of the same red brick as the wall construction.



Fig 4. Pan tiles on east elevation (left) fig 5. South gable end (right)



Fig 6. Internal view of building (left) fig 7 Some shallow brick cracks in internal walls (right)

4.3 Preliminary Bat Roost Assessment

A bat survey was undertaken by accredited agent Joseph Hassall, working under the license of James Hodson BSc, MSc (Natural England, Level 2 Bat Survey License 2017-30927-CLS-CLS), of Eco-Check Ltd on 6th April 2022 of a detached one storey barn of brick construction with a pan-tile roof and wooden windows and doors.

Barn B1: A detailed search of the exterior of the dwelling surfaces, ledges, floor etc. found no bat droppings, feeding remains or any evidence of bat activity, bat access points were noted in loose tiles.

The internal dwelling inspection found signs of bat activity from droppings observed on window sills. Potential signs of entrance were observed from within, notably due to slipped tiles and poor

condition roof lining. The building itself appears poorly sealed and has several obvious points of entry. No feeding remains or urine staining were observed in the void.

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 using the void under the lead flashing around the chimney stack, a precautionary approach should be adopted with regards to removal of flashing around the chimney (if required) due to the small possibility of solitary roosting bats being present within these areas. A watching brief by the licensed bat ecologist (LBE) will be undertaken during these works.

On the basis of bat droppings found, potential access points and suitable semi-well-connected habitat surrounding the immediate vicinity, the building was assessed as having **Low** bat roosting potential.

4.4 Dusk survey

Bat dusk surveys undertaken at the site were undertaken by wildlife consultants James Hodson MSc, Natural England Level 2 Bat Licence(2017-30927-CLS-CLS) And Joseph Hassall with a minimum of 2-3 years' experience in undertaking bat survey work.

Surveys were undertaken with a combination of Anabat Walkabout recording devices and Wildlife Acoustics Echometer Touch Pro (Heterodyne and Frequency Division) bat detectors and Anabat Express. Recordings made were analysed using Analook and Kaleidoscope software to ensure that species were correctly identified. 'Bat Surveys-Good Practice Guidelines, J. Collins, 2016' and 'Bat Workers Manual, 3rd Edition, Mitchell and Jones, 2004'. Two Sony FDR-AX33 with 2 x IR Illuminators was also used to watch the gable ends and roof elevations where bats were considered most likely to be present.

The emergence survey was undertaken during suitable weather conditions with night time temperatures between 10-17°C, wind speed below 10mph and dry. Two surveyors combined with cameras was considered sufficient to cover the elevations of the building.

Survey 1- Dusk Survey: 17th May 2022- Surveyors James Hodson, Joseph Hassall S

Sunset: 19:48 Start Time: 19:20 End Time: 22:10

Weather Conditions: 14.5°C, cloudy, dry, 6mph S.W

Time	Species	Location/Comments
21:13	Common Pipistrelle	Foraging in garden
21:17	Soprano Pipistrelle	Foraging in courtyard over wall
21:20	Noctule	Commuting over wider site
21:32	Serotine	Foraging at bottom east corner of site
21:36	Soprano Pipistrelle	Foraging in garden
21:44	Soprano Pipistrelle	Foraging in garden
21:50	Daubenton's	Commuting over site

21:51	Common Pipistrelle	Foraging
21:53	Serotine	Commuting
22:10	END OF SURVEY	NO FURTHER BATS RECORDED

Table 1.0- Dusk Bat Survey Summary

Foraging and commuting bats

There was irregular bat foraging activity within the garden. The wider site contains plentiful habitat for foraging bats across the site interior as well as the adjacent trees, hedging, shrubs, woodland and grassland

4.5 Conclusion

A dusk survey was undertaken on the 17th May which resulted in no emergences from within the storage building. Bat activity was relatively low within the site and the majority of bat passes were commuting common pipistrelle and common noctule. It is likely these commuting bat passes were to and from the farm buildings adjacent to the site.

Table 2.0 - Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of habitat features within the landscape (Adapted from table 4.1 pp. 35 in Collins, 2016)

Suitability.	Description of Roosting habitats.	Description of Commuting and Foraging habitats.
Negligible	Negligible habitat features on-site likely to be used by roosting bats.	Negligible habitat features on-site likely to be used by commuting or foraging bats.
Low	<p>A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation.)</p> <p>A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.</p>	<p>Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.</p> <p>Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.</p>
Medium	<p>A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).</p>	<p>Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub or linked back gardens.</p> <p>Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.</p>
High	<p>A structure or tree 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.</p>	<p>Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge.</p> <p>High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts.</p>

6.0 Evaluation and Recommendations

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 in relation to bat species

British bat species are protected under the Wildlife and Countryside Act (1981) and The Conservation of Habitats and Species (Amendment EU Exit) Regulations 2019. 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

In accordance with best practice guidance (Collins, 2016)¹, a building of **Low** potential affords opportunity for one or more roost sites that could be used by individual bats opportunistically, but does 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. There will be no direct or indirect impacts on any designated wildlife sites given the small scale of the proposed works. The proposed re-roofing works could potentially disturb roosting bats within the areas highlighted and so a pre-works inspection and watching brief by the licensed bat ecologist will take place at this time.

6.1.3 Recommendations

Precautionary mitigation is recommended to ensure the proposed re-roofing 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 instance, further survey work and a European Protected Species Licence (EPSL) may be required.

Bats: The built scheme should take the opportunity to enhance roosting opportunities through the provision of bat boxes and bricks. As part of general biodiversity enhancement for the site, it is recommended that new bat roosting and bird nesting resources are introduced. This will include bat roosting boxes erected on the building or mature trees within the site (**Appendix 3**):

- 1 x Eco-Roost Double chamber hibernation box
- 1 x Eco-Roost Bat Brick in the south gable wall

It is recommended that any new fascia or weatherboards should be proud of the wall by c15/20mm with a gap at the bottom to allow roosting by bats.

In order for the resources discussed to be viable bat sensitive lighting should be employed to avoid light pollution. In general, it is recommended that site lighting is kept to a minimum. Security lighting should be operated on short timers. Any new external lights will be set on a motion detector and positioned in such a way that they do not shine on the boundary habitats, tree canopies or hedging. Low intensity lighting should be used where possible in place of high intensity discharge or sodium lamps, this will minimize disturbance to foraging and commuting bats.

In accordance with the Bat Conservation Trust's publication *Bats and artificial lighting* (BCT, 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);
- Lighting that is required for security reasons should use a lamp of no greater than 2000 lumens (150 Watts) and be PIR sensor activated, to ensure that the lights are not on only when required (Jones, 2000; Collins, 2016);

6.1.4. Assessment of impact and licensing

The value of the site to bats is assessed as **Moderate** at the **Parish/ Neighbourhood** scale due to the probability of bat use. The proposed works have a low likelihood of impacting on bats and there was no evidence of bat activity or bat roosts within the roof sections subject to disturbance. However, in the event of bat presence would still be classified as disturbance to a roost and/or roost modification and so if presence is confirmed that a European Protected Species Mitigation License EPS/M or Low Impact Licence (BMCL) will be required.

6.1.5 Reasonable avoidance measures

Avoiding damage to existing roosts is always the preferred option. This involves taking steps to avoid killing, injury or disturbance to bats and damage to or loss of their roosts. The most effective method of avoidance is to carry out the work at an appropriate time of the year when bats are absent. The great majority of roosts are used only seasonally so there is usually some period when bats are not present and works can occur without adverse impacts on bats.

An EPS development licence is not required in situations where it can be demonstrated that satisfactory mitigation and enhancement works are sufficient to avoid offences being committed under the Habitat Regulations. If no evidence of roosting bats is found during the daytime internal inspection and/or nocturnal roost surveys, conversion works may proceed. As part of the site induction process, all staff working on site will be made aware of the low potential for presence of roosting bats on site and their status as a UK and European Protected Species through a toolbox talk given by the Ecological Clerk of Works (ECoW). All recommendations listed in this chapter will also be outlined.

Timing of works. Work involving breaking into the existing brickwork and removal of roof materials on buildings should take place between September and May or following a visit by the bat worker to supervise works and to confirm absence of bats.

6.2 Bird Species

6.2.1 Overview of legislation relating to birds

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

No bird nests were found to be present in the building.

6.2.3 Recommendations

If works which are likely to damage bird nests (e.g., removal of roofing material etc.) need to be carried out during the nesting period (1st March to 31st August inclusive) a check should be made for nesting birds, the day before works is 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.

To increase nesting opportunities generally and to compensate for the loss of nesting areas, 5 nest boxes should be installed. Installation of the nest boxes will be supervised by 'Eco- Check Ltd' or an experienced ecologist to ensure the correct positioning for each species. The types of nest boxes will include;

- 1 x Eco-Roost bird box. (32mm)
- 1 x Eco-Roost nest box. (28mm)
- 1 x Eco-Roost double house sparrow box.

7.0 Habitats Regulations and Derogation Test

Bat presence within the structure has been ruled out through the dusk survey completed on the 17th May, showing that the proposed works will not disturb a population of bats. Due to the transient nature of the species, this can never be fully ruled out and if any species is turned up during the project, works should stop immediately and a suitably qualified consultant contacted.

With respect to the impact on bats, an offence under Article 12 of the European Directive and Regulation 41 of The Conservation of Habitats and Species (Amendment EU Exit) Regulations 2019 is unlikely to occur. In accordance with the Standing Advice issued by Natural England, as part of the decision-making process, the Local Planning Authority must consider whether an EPS Licence is likely to be required or granted by Natural England in order to derogate from the protection afforded by the Habitats Regulations.

Given the lack of evidence of any roosting bats as well as the low probability of bat interest within the working areas and the potential to incorporate mitigation within the development for bats, it is considered that there are reasonable and realistic opportunities to maintain the favourable conservation status of the local bat population despite the proposed work.

8.0 Further Surveys

If development has not commenced within 18 months of May 2022 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)

“A ‘statement of good practice’ shall be signed upon completion by the competent ecologist, and be submitted to the LPA, confirming that the specified enhancement measures have been implemented in accordance with good practice upon which the planning consent was granted’.

Reason: To conserve and enhance Protected and Priority species and allow the LPA to discharge its duties under the UK Habitats Regulations, the Wildlife & Countryside Act 1981 as amended and s40 of the NERC Act 2006 and s17 Crime & Disorder Act 1998.

9.0 References

Bat Surveys-Good Practice Guidelines, J. Collins, 2016' Corbet and Harris (1991).

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, March 2022 www.magic.gov.uk

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

Appendix 1



Fig 5. Internal view of barn (left) Fig 6. tear in internal lining (right)



Fig 7. Droppings observed on window sill (left) Fig 8. South gable wall internal (right)



Fig 9. Torn internal lining (left) Fig 10. North gable end, partially obscured by lean-to polycarbonate roof

Appendix 2

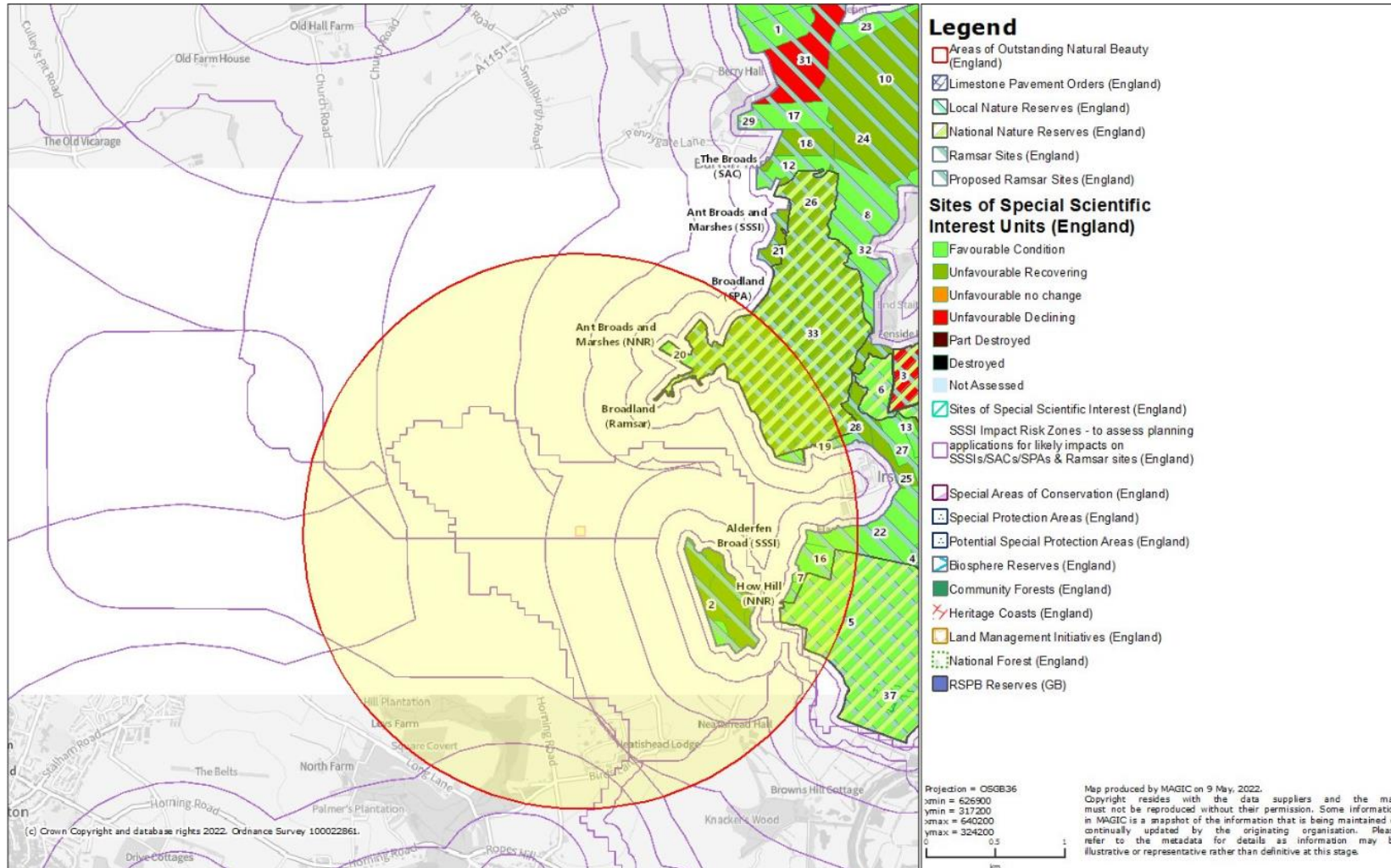


Fig 11. Designated sites map – Magic maps 2022

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 SINC 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.

Impact Assessment Methodology

Scale Level

County/ Metropolitan

- Designated or qualifying features within Local Nature Reserves or Wildlife Sites, selected on county/metropolitan criteria, or features that meet the published selection criteria for designation.
- Semi-natural ancient woodland greater than 0.25 ha in area.
- Significant and viable areas of habitat identified in County BAPs as requiring site protection.
- Species populations of county/metropolitan importance.
- Significant populations of a county/metropolitan important species (i.e. listed in a County/Metropolitan Red Data Book or BAP on account of their regional rarity or localisation).

• District/Borough

- Biological features within Local Nature Reserves, etc., selected on District/Borough ecological criteria.
- Areas of habitat identified in a sub-County (District/Borough) BAP or in the relevant Natural Area profile, and other features that are scarce within the District/Borough or that appreciably enrich the District/Borough habitat resource.
- Diverse and/or ecologically valuable hedgerow networks.
- Semi-natural ancient woodland smaller than 0.25 ha in area.
- Species populations of District/Borough importance.
- Significant populations of a District/Borough important species (i.e. listed in a local BAP on account of their local rarity or localisation).

Parish/Neighbourhood

Areas of habitat considered to appreciably enrich the habitat resource within the context of the Parish or Neighbourhood, e.g. species-rich hedgerows.
Valuable biological features within Local Nature Reserves selected on Parish ecological criteria.

Scale	Level of Value
International	Very High
National	High
Regional	Medium
County/ Metropolitan	Medium
District/ Borough	Lower
Parish/ Neighbourhood	Lower

Table 1.2 Definitions of impact magnitude

Major	Loss of over 50% of a site feature, habitat or population Adverse change to all of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to gain of over 50% of a site feature, habitat or population
Intermediate	Loss affecting 20-50% of a site feature, habitat or population Adverse change to over 50% of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to a gain of 20-50% of a site feature, habitat or population
Minor	Loss affecting 5-19% of a site feature, habitat or population Adverse change to 20-50% of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to a gain of 5-19% of a site feature, habitat or population
Neutral	Loss affecting up to 5% of a site feature, habitat or population Adverse change to less than 20% of a site feature, habitat or population For benefits, an impact equivalent in nature conservation terms to a gain of up to 5% of a site feature, habitat or population

Table 1.3 Impact significance

Value of Receptor	Major Negative	Intermediate Negative	Minor Negative	Neutral	Minor Positive	Intermediate Positive	Major Positive
International (Very High)	Severe Adverse	Severe Adverse	Major Adverse	Neutral	Major Beneficial	Major Beneficial	Major Beneficial
National (High)	Severe Adverse	Major Adverse	Moderate Adverse	Neutral	Moderate Beneficial	Major Beneficial	Major Beneficial
Regional (Medium)	Major Adverse	Moderate Adverse	Minor Adverse	Neutral	Minor Beneficial	Moderate Beneficial	Major Beneficial
County/Metropolitan (Medium)	Moderate Adverse	Minor Adverse	Minor Adverse	Neutral	Minor Beneficial	Minor Beneficial	Moderate Beneficial
District/Borough (Lower)	Moderate Adverse	Minor Adverse	Minor Adverse	Neutral	Minor Beneficial	Minor Beneficial	Moderate Beneficial
Parish/Neighbourhood (Lower)	Minor Adverse	Minor Adverse	Minor Adverse	Neutral	Minor Beneficial	Minor Beneficial	Minor Beneficial
Negligible	Neutral	Neutral	Neutral	Neutral	Minor Beneficial	Minor Beneficial	Minor Beneficial

Hedgerow Woody Species

From Schedule 3 of Hedgerow Regulations 1997

Alder (<i>Alnus glutinosa</i>)	Hazel (<i>Corylus avellana</i>)
Apple, crab (<i>Malus sylvestris</i>)	Holly (<i>Ilex aquifolium</i>)
Ash (<i>Fraxinus excelsior</i>)	Hornbeam (<i>Carpinus betulus</i>)
Aspen (<i>Populus tremula</i>)	Juniper, common (<i>Juniperus communis</i>)
Beech (<i>Fragus sylvatica</i>)	Lime, large-leaved (<i>Tilia platyphyllos</i>)
Birch, downy (<i>Betula pubescens</i>)	Lime, small-leaved (<i>Tilia cordata</i>)
Birch, silver (<i>Betula pendula</i>)	Maple, field (<i>Acer campestre</i>)
Black-poplar (<i>Populus nigra sub-species betulifolia</i>)	Mezereon (<i>Daphne mezereum</i>)
Blackthorn (<i>Prunus spinosa</i>)	Oak, pedunculate (<i>Quercus robur</i>)
Box (<i>Buxus sempervirens</i>)	Oak, sessile (<i>Quercus petraea</i>)
Broom (<i>Cytisus scoparius</i>)	Osier (<i>Salix viminalis</i>)
Buckthorn (<i>Rhamnus cathartica</i>)	Pear, Plymouth (<i>Pyrus cordata</i>)
Buckthorn, alder (<i>Frangula alnus</i>)	Pear, wild (<i>Pyrus pyraeaster</i>)
Butcher's-broom (<i>Ruscus aculeatus</i>)	Poplar, grey (<i>Populus x canescens</i>)
Cherry, bird (<i>Prunus padus</i>)	Poplar, white (<i>Populus alba</i>)
Cherry, wild (<i>Prunus avium</i>)	Privet, wild (<i>Ligustrum vulgare</i>)
Cotoneaster, wild (<i>Cotoneaster integerrimus/cambricus</i>)	Rose (<i>Rose species</i>)
Currant, downy (<i>Ribes spicatum</i>)	Rowan (<i>Sorbus aucuparia</i>)
Currant, mountain (<i>Ribes alpinum</i>)	Sea-buckthorn (<i>Hippophae rhamnoides</i>)
Dogwood (<i>Cornus sanguinea</i>)	Service-tree, wild (<i>Sorbus torminalis</i>)
Elder (<i>Sambucus nigra</i>)	Spindle (<i>Euonymus europaeus</i>)
Elm (<i>Ulmus species</i>)	Walnut (<i>Juglans regia</i>)
Gooseberry (<i>Ribes uva-crispa</i>)	Wayfaring-tree (<i>Viburnum lantana</i>)
Gorse (<i>Ulex europaeus</i>)	Whitebeam (<i>Sorbus species</i>)
Gorse, dwarf (<i>Ulex minor</i>)	Willow (<i>Salix species</i>)
Gorse, western (<i>Ulex gallii</i>)	Yew (<i>Taxus baccata</i>)
Guelder Rose (<i>Viburnum opulus</i>)	
Hawthorn (<i>Crataegus monyogyna</i>)	
Hawthorn, midland (<i>Crataegus laevigata</i>)	

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 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				
Badgers	Surveys	*	All survey methods – best time is in spring and early autumn / winter												
	Mitigation	**	Building of artificial setts. No disturbance of existing setts						Stopping up or destruction of existing setts						See Jan to June
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			

* Applies in Northern Ireland 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		
Dormice	Surveys	*	Nut searches (sub-optimum time)		Nest searches (April sub-optimum time)		Cage traps and hair tube surveys to mid-October. Nut searches from September (optimum time September to December). Nest searches (optimum time September to March)						Nut searches and nest searches (optimum time)			
	Mitigation	**	No clearance works				Clearance works (sub-optimum time)		No clearance works			Clearance works to early October (optimum time)		No clearance works		
Otters	Surveys	*	Surveys for otters can potentially be conducted all year round, though vegetation cover and weather conditions may limit the times at which surveys can be carried out													
	Mitigation	**	Mitigation can potentially be conducted in any month, but is likely to be restricted where otters are found to be breeding													
Pine martens	Surveys	*	Surveys may be conducted all year round weather permitting. Optimum time is spring and summer. Surveys for breeding dens from March to May.													
	Mitigation	**	Works in areas of pine marten habitat and dens		Avoid all works in pine marten habitat								Works in areas of pine marten habitat and dens			
Red squirrels	Surveys	*	Surveys may be conducted all year round weather permitting. Optimum time is spring and summer. Surveys for breeding females from December to September.													
	Mitigation	**	Avoid all works in red squirrel habitat										Works should preferably be conducted at this time		Avoid all works in red squirrel habitat	
Water voles (n/a in NI)	Surveys	*	Reduced activity	Initial surveys possible	All survey methods can be used during this period, though vegetation cover and weather conditions may limit the times at which surveys can be carried out. (Optimum time: March to June)										Initial surveys possible	Reduced activity
	Mitigation	N ²	Avoid all works in water vole habitat		Works in water voles habitat possible		Avoid all works in water vole habitat			Works in water vole habitat possible		Avoid all works in water vole habitat				
Sand lizards, smooth snakes (n/a in NI) and common lizards	Surveys	*	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	**	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			

² The extent of legal protection of the water vole is currently under review, it has been proposed to fully protect water voles, as well as their habitats.

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.

Habitat Protection
Where retained habitat is adjacent an area of development, what should you do?

Wildlife & Construction

Wildlife and Construction Best Practice Guidance



BIRDS AND THEIR NESTS

- All species of wild bird in the UK are protected during the breeding season.
- They are protected against intentional killing, injuring or taking, damaging or destroying nests in use or being built, and taking or destroying eggs.
- Birds can nest in places, such as scrub, hedgerows, trees, in or on buildings, ledges, cliffs and on the ground, depending on the species. In the UK they typically build their nests and lay their eggs between March and the end of July.
- What if you find a bird nesting on site?
- All works in the area must stop until the birds have completed breeding.
- An exclusion zone around the nest/s area should be put up by an ecologist.
- **DO NOT** undertake scrub clearance during the bird-nesting season (March – end of August) if at all possible.
- **DO NOT** undertake scrub clearance during the bird-nesting season without an experienced ecological being present.



HABITAT PROTECTION

- Where retained habitat is adjacent an area of development, what should you do?
- An exclusion zone should be put in place consisting of barriers separating construction activities from wildlife areas.
- No polluting materials should be used near rivers.
- 'Keep out wildlife exclusion zone' signs to be secured to barriers.



REPTILES AND AMPHIBIANS

- Reptiles and amphibians are protected, which makes it an offence to intentionally and recklessly kill, injure or take any species of reptile.
- Amphibians can be found in or near ponds or other water bodies on development sites, including temporary pools. Most amphibians will hibernate on land during the winter months.
- What should you do if you find an amphibian or reptile and are unsure of the identity?
- Reptiles and amphibians are fairly widespread and may be found within dense vegetation on sites that are directly next to open areas of rubble / rocks and / or short grassland.
- Clearance works should be undertaken in a phased manner and supervised by an ecologist.
- **STOP!** if you think you have found a reptile or amphibian on site, stop all works and consult an ecologist immediately.

TREES AND HEDGEROWS

- Trees should be fenced off by no less than the width of the canopy spread until all development work is complete.
- Do not use a tree for external fixtures or fittings.
- Nothing should be stored against the trunks of trees.
- There should be no change in soil depth within 2m of the trunks, unless it has been approved by an arboriculturist.
- Site Compounds should be erected outside of the tree canopy.



URS Ltd
Mayflower House
Armada Way
Plymouth
Devon PL1 5LD
01752 575700
paul.gwynon@scottwilson.com
www.urscorp.co.uk



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 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/>

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

Eco-Roost Bat Brick



Eco-Roost Double Chamber Bat Box



Eco-Roost Double Kent Box





**Eco-Roost 28mm, 32mm and Open fronted
bird boxes**



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	
<p>CedarPlus Nest Box</p> <p>Available with 2 entrance hole sizes:</p> <p>32mm hole – suitable for great, marsh and coal tits, redstart, nuthatch, pied flycatcher, house sparrow and tree sparrows.</p> <p>26mm hole – to allow access only to blue, marsh and coal tits (and possibly wrens).</p> <p>Height: 370mm; Width: 156mm; Depth: 175mm</p>	
<p>Schwegler 1B Bird Box</p> <p>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.</p> <p>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.</p> <p>Entrance hole sizes:</p> <p>32mm hole – will attract great, blue, marsh, coal and crested tit, redstart, nuthatch, collared and pied flycatcher, wryneck, tree and house sparrow.</p> <p>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.</p> <p>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.</p> <p>Height: 23cm; Diameter: 16cm</p>	
<p>No. 10 Schwegler Swallow Nest</p> <p>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.</p> <p>To avoid problems with droppings accumulating, a droppings board could be placed beneath each nest box to collect the droppings.</p>	